PRESCRIBE 2e

Programming Manual

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Programming Manual

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Introduction

This manual contains information needed for you to use the firmware features provided by your Kyocera printer. Among these features is Prescribe 2e, a highly accessible, user-oriented command language that makes it easy for you to take full advantage of your printer's capability.

Prescribe 2e is an extended version of the standard Prescribe 2e command language. It includes all of the standard features of Prescribe, an earlier Kyocera command language and also allows you to:

- extensive manipulation of fonts and character code tables
- use the ability to draw objects by constructing and manipulating paths including ellipses and round boxes, etc.
- execute macros including carbon-copy macro
- control external optional units (feeders, etc.)

You can access the features of Prescribe 2e from any of the printer's seven emulation modes. These modes include:

- Hewlett-Packard LaserJet emulation
- Hewlett-Packard HP 7550A (plotter) emulation
- IBM Proprinter X24E (24-pin dot matrix printer) emulation
- Epson LQ-850 (24-pin dot matrix printer) emulation
- Diablo 630 emulation
- generic line printer emulation
- KPDL (Apple LaserWriter II NTX (NT) emulation) [an option on some models]

About This Manual

The first four chapters of this manual constitute an tutorial introduction to Prescribe 2e:

Chapter 1 introduces some basic concepts. It outlines the graphic handling features of Prescribe 2e and introduces program macros, a concept that makes it easy to define sequences of Prescribe 2e commands, then call them repeatedly whenever they are needed.

Chapters 2 explains the details of each Prescribe 2e command.

Chapter 3 provides how to manage font selection and font samples.

Later, **Chapter 4** explains the barcode printing capabilities of the command language.

Chapter 5 explains how to reprogram the printer's firmware for customization.

Chapter 6 gives notes on the printer's various emulation modes.

An Index is also provided at the end of this manual.

Chapter 7 explains how to use the MPS (Multiple Printing System) commands to perform electronic sorting, job allocation, stapling, and barcode printing.

Chapter 8 provides an overview of Prescribe 2c (a special command set for color printers) and describes each command.

Chapter 9 describes how to use the mailbox functions with virtual mailbox commands, and describes each command.

Range

The standard features of Prescribe 2e described in this manual apply to Kyocera FS-series printers of the following series models:

Series	HP LaserJet emulation
FS-400	LaserJet III
FS-600	LaserJet 5P
FS-680	LaserJet 5P
FS-800	LaserJet 5Si (Excluding support for papersize larger than A4/letter.)
FS-1200	LaserJet 2100
FS-1500	LaserJet III
FS-1600	LaserJet 4
FS-1700	LaserJet 4 Plus
FS-1700+	LaserJet 5M
FS-1750	LaserJet 4000
FS-3400	LaserJet III
FS-3600	LaserJet 4
FS-3700	LaserJet 4 Plus
FS-3700+	LaserJet 5M
FS-3750	LaserJet 4000
FS-6500	LaserJet 4
FS-6700	LaserJet 5M
FS-7000	LaserJet 5Si
FS-7000+	LaserJet 5M/5Si
FS-9000	LaserJet 5M/5Si

Most Prescribe 2e commands operate in the same way on all of these models. However, there are exceptions: in particular, some models have less than a full page of raster memory, causing certain restrictions on graphics, and some have only one paper cassette and one paper tray, making some commands irrelevant.

Model-dependent differences are noted at the pertinent locations in this manual. Particularly, *Chapter 2* provides information on newly added Prescribe 2e commands and permanent parameters specifically equipped with this model.

Conventions

italic is used for emphasis and also refers to a related chapter or section in this manual or another related document. `fixed-pitch` means text or commands that you must type exactly as it appears.

Chapter 1

Introduction to Prescribe 2e

Prescribe 2e is the native language of your printer. Consisting of easily remembered commands, such as **SLM** for Set Left Margin, and **BOX** to draw a box, it gives you the capability to control line and character spacing, adjust margins, change fonts, position text, draw graphics, and print multiple copies of each page.

Most application software controls printers by means of codes and escape sequences that are built into the program and are not directly visible to the user. In contrast, Prescribe 2e commands are made of ordinary characters that you can type in yourself and see on the computer screen. This makes it easy for you to customize printing and add features that may not be supported by your application.

This chapter presents an introduction to Prescribe 2e starting with an explanation of the commands by which you start and exit Prescribe 2e. It is followed by an introduction to some basic concepts of Prescribe 2e, then a discussion of the command format and command parameters.

1.1. Entry and Exit

The page printer can be thought of as having a dual personality. When its power is switched on, it performs the normal printer functions of printing out files and other data, with a minimum of noise and a maximum of speed. Application software can control the printer using one of the seven emulations. When the page printer uses an emulation, it is said to be printing in emulation mode.

Prescribe 2e is an additional mode of operation in which the printer understands data it receives not as text to be printed, but as commands to be executed. The Prescribe 2e mode is available at any time during operation from any emulation mode. The initializing string that takes the printer from the usual text-printing mode into the Prescribe 2e mode is **!R!**. The command that returns it from the Prescribe 2e mode to the emulation mode is **EXIT;**. These transitions are diagramed in the figure below.

Mode Transitions

The printer's emulation mode can be set by the FRPO (Firmware RePrOgram) P1 command. See *Chapter 6* for details. The printer is factory-set to emulate the Hewlett-Packard LaserJet.

The figure below shows how these transitions can be used in a file. The boxed parts are Prescribe 2e commands. Note how each block of commands begins with !R! and ends with EXIT;. These sections are not printed; instead, they set margins, select three different fonts, and draw a box around one line of text. The remainder of the file consists of ordinary text, and is printed out as shown in the figure on the next page.

Text Including Prescribe 2e Commands

```
!R! RES; SLM 1; STM 1; SPD 0.03; FTMD 13; FONT 11;
EXIT;
WELCOME TO WINDFALL NATIONAL PARK

!R! FONT 2; EXIT;
   The park entrance is located in the rolling
hills of the Northern Woods, a forested area
abundant in deer, elk, squirrel, rabbit, opossum,
lynx, wolf, and other wildlife. It is the park's
most popular area, featuring excellent trails and
campsites for hiking and backpacking.

!R! BOX 3.4, 0.55; FSET 1s5B; EXIT;

      Hikers should avoid this area during hunting
season.

!R! FONT 2; EXIT;
   Hikers in search of high-altitude adventure
will find Mt.Baker a rewarding...
```

Prescribe 2e Example

WELCOME TO WINDFALL NATIONAL PARK

The park entrance is located in the rolling hills of the Northern Woods, forested area abundant in deer, elk, squirrel, rabbit, opossum, lynx, wolf, and other wildlife. It is the park's most popular area, featuring excellent trails and campsites for hiking and backpacking.

Hikers should avoid this area during hunting season.

Climbers in search of high-altitude adventure will find Mt. Baker a rewarding ...

The previous example contains five sequences of Prescribe 2e commands. The basic configuration of a Prescribe 2e command sequence is:

```
!R! command; command; ...; command; EXIT;
```

There is a limit to the number of commands you can include between the initial !R! and the final EXIT;. The initial !R! must be followed by a space, and each command must end with a semicolon.

Note: **The use of Prescribe 2e commands in document files is conditional on the behavior of your word processing software. Some word processing programs add control codes that interfere with Prescribe 2e. If you can not control software in this way, try using a non-word processing mode (ASCII text function, for example) of the software.**

1.2. Format of Prescribe 2e Commands

The basic format of a Prescribe 2e command is:

●●● or ●●●● (command name) parameter, ..., parameter;

The command names generally consist of three or four letters. In most commands, the parameters must be followed by commas. The last parameter is always followed by a semicolon. Some commands (RES, for example) have no parameters. In this case, the command should be followed immediately by a semicolon (`RES;`).

One of the Prescribe 2e commands uses parameters in the same manner as in the Page Control Language of the Hewlett-Packard LaserJets. This is the FSET (change current Font SETting by characteristic) command, which specifies a font by specifying a number of identifying characteristics. The parameters of the FSET command are always written without separating spaces or punctuation. For details, see the discussion of font selection in *Chapter 3*.

The length of a single Prescribe 2e command is limited to 255 characters, from the first letter of the command name through the final semicolon. Commands longer than 255 characters are not executed.

Spaces, carriage return codes, and line feed codes are generally ignored in Prescribe 2e command sequences. These characters are not generally counted in the command length. (*Exception:* Spaces are not ignored in quoted character strings.) To improve readability, place at least one space before each command or place each command on a separate line.

1.3. Basic Concepts

This section discusses a few basic concepts concerning how the page printer prints on the page. These concepts are:

- Edge limits
- Margins
- Coordinate systems
- Text positioning/Character spacing
- Paths
- Logical page and physical page
- Page orientation and direction

Edge Limits

The page printer cannot place print on the outside edges of the paper. The edge limits to which printing is possible are located 5 mm inside the edges of the paper. Refer to the figure on the next page. The edge limits adjust automatically to the size of the cassette (although not to the size of manually fed paper). The edge limits can also be set to various standard sizes by the SPSZ (Set Paper SiZe) command, or by the equivalent HP LaserJet commands. In HP LaserJet emulation, the edge limits slightly vary according to the page orientation (as also shown in the figure on the next page).

Margins

The top and left margins are set in centimeters or inches in relation to the top and left edge limits of the page. The bottom and right margins can also be set as a distance from the top and left edge limits, or they can be set in terms of page width, page length, or lines per page.

Edge Limits and Margins

The edge limits are located 5 mm inside the edges of the paper in all emulation modes except HP LaserJet III/4/4 Plus emulation. In HP emulation, the edge limits are 6 mm (5mm in landscape orientation) from the left edge and 4 mm from the top of the paper.

When the printer passes the bottom margin while printing text, it prints the page and feeds to the next page. Spacing is carried over, so if the bottom margin does not occur at an exact number of lines, excess space is printed at the top of the next page.

If you are using word-processing software that sets the margins automatically, you should not set them with Prescribe 2e commands.

Page Orientation and Direction

The term *page orientation* refers to the direction in which text is placed on the page. In a vertical direction, it would be called portrait and a horizontal direction would be called landscape. The term *print direction*, which follows this section, refers to the orientation of the logical page's coordinate system with respect to the current page orientation.

Page Orientation

Changing the page orientation automatically adjusts the margins so that they remain the same distance from the four edges of the paper. If the printer cannot make these margin settings (for example, if the left margin would be to the right of the right margin), it sets the margins to the edge limits.

Scalable fonts are automatically rotated to match the current orientation. Bitmap fonts can not be rotated. You must reselect the bitmap fonts to match any change in orientation.

Page Orientations

Portrait Orientation

Landscape Orientation

Print Direction

The print direction can be modified in 90° increments. These page orientations are referred to as portrait, landscape, reverse portrait, and reverse landscape. Changing the print direction rotates the page coordinate system in the same manner as changing the page orientation. However, in this case, *portrait* refers to the print direction in which the axes of the coordinate system are oriented in the same direction as for the currently selected page orientation.

Changing the print direction also changes the margins to maintain the same printable area as prior to the change. The current position (the physical location in which the next character will be printed) and its coordinate values remain the same as in the previous print direction.

Changing the print direction also changes the orientation of any subsequent raster graphics and Prescribe 2e vector graphics. However, it does not affect the orientation of any subsequent HP-GL/2 graphics. (HP-GL/2 graphics can only be rotated with the HP-GL/2 RO command or the LaserJet orientation command.)

Print Direction

Portrait print direction

Landscape print direction

Reverse landscape print direction

Reverse portrait print direction

Coordinate Systems

With Prescribe 2e, positions on a page are described in terms of *X* and *Y* coordinates. The origin of the coordinate system (the position at which *X* and *Y* both equal *0*) is located at the intersection of the top margin and the left margin. Values of *X* greater than *0* indicate positions to the right of the origin, and values of *Y* indicate positions below the origin. See the figure on 1-15. When the top and left margins are changed, the physical position of the origin changes accordingly.

Text Positioning

The printer always keeps track of its current position on the page. The current position can be thought of as a cursor that moves as data is printed. At any instant, the cursor indicates where the next character will be printed or the next graphics will be drawn. (The printer does not have separate cursors for text and graphics.)

Text and graphics can be positioned at arbitrary locations on the page by moving the cursor with positioning commands (MAP, for example).

Text Positioning

```
TITLE
!R! BOX 1, 1; MRP 2, 1;
EXIT; LABEL
```

Character Spacing

Each character is printed within an individual cell as shown below. The character sits on a line called the *baseline*. Characters such as **y** descend below the baseline.

In some character fonts, all the character cells are the same size, so the number of character positions per inch is fixed. In other fonts, the size of character cells is proportional to the size of characters. These proportional fonts produce text that is easier to read. However, in order to align the right margin, you must use software that supports the printer's proportional spacing.

Character Spacing

Paths

A path is a set of straight and curved line segments. Paths can be open, as in the case of lines, or closed, as in the case of rectangles, circles, or any fully enclosed area of any shape. The segments may be connected with one another, or they may be disconnected. Further, a path may contain multiple closed *subpaths*, representing several areas, and they may intersect themselves in arbitrary ways.

Paths can be used to draw lines and curves or specify boundaries of filled areas, including the outline of a character.

Paths are explained more fully in section 1.6.

Logical Page and Physical Page

The logical page defines the limits of the coordinates within which text and graphics can be located. There are two types of logical page, as shown in the following figure. The standard mode logical page imposes limits on specifiable coordinates. The coordinates have no limitations for the path mode logical page.

Logical Page and Physical Page

With the **standard mode logical page**, any position specification that lies outside of the logical limits is automatically adjusted to bring it within the limits. For example, the page on the upper left in the preceding figure shows what happens if you attempt to draw a diagonal line from below the bottom edge limit to a point to the right of the right edge limit when the standard mode logical page is used. The fine line represents the line as specified by the user; the thick line shows what is actually drawn by the printer.

With the **path mode logical page**, coordinates are not adjusted even if they fall outside of the edge limits. In this case, as shown in the lower right page in the preceding figure, the line is defined by the specified starting and ending points, but parts falling outside of the edge limits are clipped.

1.4. Command Parameters

Numeric Parameters

Many of the Prescribe 2e commands use number values to specify parameters. For example, numbers are used to specify distances in inches, centimeters, points, or dots. Negative numbers are also allowed.

For computer code values beyond four decimal places, the printer ignores the fifth and subsequent decimal places.

Examples:

Number output by computer	Number used by printer
1234.1234	1234.1234
-1234.1234	-1234.1234
0.123456	0.1234

Some commands have angle parameters. Angles are specified in degrees. (The printer does not recognize radians). The printer rounds off all angles to the nearest integral degree. Only angles in the range from -360 degrees to 360 degrees are recognized. Angles less than -360 degrees are ignored, and angles greater than 360 degrees are treated as the remainder of the angle divided by 360.

Examples:

Angle output by computer	Angle used by printer (degrees)
90	90
-90	-90
90.4	90
90.5	91
-400	Ignored

The printer does not accept the exponential notation used in some computer languages. For example, do not specify 1E-3 instead of 0.001.

Character Strings

Prescribe 2e text-printing commands have parameters that consist of character strings. A character string is any string of characters enclosed by quotation marks or apostrophes, such as shown in the example below.

```
TEXT 'You are about to enter Prescribe 2e.';
```

Prescribe 2e allows character strings to be enclosed in either single quotation marks (apostrophes) or double quotation marks. The following example has exactly the same meaning as the one above.

```
TEXT "You are about to enter Prescribe 2e.";
```

The beginning of a character string is recognized when the first single or double quotation mark appears. If the beginning quotation mark is a single quotation mark, the string does not end until the next single quotation mark. If the beginning quotation mark is a double quotation mark, the string does not end until the next double quotation mark.

Whatever comes in the middle of a character string, including commas, semicolons, and even Prescribe 2e command names, is recognized as part of the character string, and not as part of the Prescribe 2e command language. For example, the expression EXIT; in the following string is just text; it does not cause the printer to exit from the Prescribe 2e mode.

```
TEXT 'NO EXIT; NO RETURN.';
```

When the string itself contains one type of quotation mark, the quotation mark must be enclosed in quotes of the other type. Here are two examples:

```
TEXT ”You’re about to enter Prescribe 2e.”;
TEXT ’ ” ” ” ’;
```

In the first command above, the character string starts with a double quotation mark. The printer therefore expects the string to end with a double quotation mark, and regards the apostrophe in the word *You're* as an ordinary character, not as the string terminator.

Similarly, the double quotation marks in the second command above are recognized as ordinary characters, not as string terminators.

Since an apostrophe or quotation mark can start a character string anywhere in a Prescribe 2e command sequence, it is important not to start character strings unintentionally. The following examples demonstrate incorrect use of apostrophes and double quotation marks.

Incorrect:

```
!R! CMNT Don’t leave stray apostrophes; EXIT;
```

Incorrect:

```
!R! CMNT The symbol ” means inches; EXIT;
```

In both of the above cases, the printer assumes that the expression EXIT; is part of a character string started by the preceding apostrophe or quotation mark, and fails to exit the Prescribe 2e mode. The correct way to write these comments is:

Correct:

```
!R! CMNT ”Don’t leave stray apostrophes”; EXIT;
```

Correct:

```
!R! CMNT ’The symbol ” means inches’; EXIT;
```

Character strings must not exceed the 255-character limit on total command length. If a character string exceeds this limit, the printer terminates it forcibly and begins looking for the next Prescribe 2e command.

Upper and Lowercase Letters

Regarding upper and lowercase characters, Prescribe 2e follows the same rule as many computer programming languages: it discriminates case inside character strings and ignores it elsewhere. You can type command names in upper or lowercase.

Correct:

```
!R! TEXT 'A'; CIR 1; EXIT;
```

Also correct:

```
!R! text 'A'; cir 1; exit;
```

Also correct:

```
!R! Text 'A'; Cir 1; Exit;
```

Each of these commands prints the capital letter 'A' inside a circle. In the printout shown, the unit is centimeters. The reason that the letter 'A' is off center in the circle is that the cursor is not located at the center of the circle, but at left corner of the letter 'A'.

The command

```
!R! TEXT 'a'; CIR 1; EXIT;
```

prints a lowercase **a** because the letter occurs inside a character string.

The sole exception to upper and lowercase usage in Prescribe commands occurs with the initializing !R! command. This command must always use an uppercase R. The printer will not enter the Prescribe 2e mode in response to !r!.

In this manual, Prescribe 2e commands are printed in uppercase for readability.

Outside of Prescribe 2e mode, the printer always distinguishes between uppercase and lowercase letters and prints exactly what is sent.

Special Parameters

Two Prescribe 2e commands use unquoted strings of characters as parameters. These are the FSET (change current Font SETting by characteristic) command and the CSET (Change symbol SET by symbol-set ID) command.

Note: **See *Chapter 3* for a detailed explanation of how these commands are used to select fonts.**

The FSET and CSET commands use parameters that closely resemble the command parameters used for font control in Hewlett-Packard's printer control language. For example, the Prescribe 2e command

```
FSET 0p12h12v0s0b6T;
```

selects the font whose characteristics most closely matches the following font parameters:

- Monospaced font (0p)
- Character spacing of 12 characters/inch (12h)
- Character height of 12 points (12v)
- Upright style (0s)
- Medium weight (0b)
- LetterGothicBM12-Roman typeface (6T)

In Hewlett-Packard's PCL, the corresponding command would be `ESC (s0p12h12v0s0b6T.`

Similarly, the Prescribe 2e command `CSET 11U;` designates use of the PC-8 Danish/Norwegian symbol set. The corresponding Hewlett-Packard PCL command is `ESC(11U`.

Graphics Tutorial

Prescribe 2e provides a wide variety of graphics operators, allowing you to easily construct and print almost any imaginable shape or pattern.

This chapter introduces the various graphics concepts of Prescribe 2e, and illustrates how to use many of its graphic functions. It defines standard graphics mode, path mode graphics, and raster graphics. It explains how to use predefined fill patterns, how to define your own fill patterns, and introduces ways in which you can change the *print model*, the rules that determine the manner in which patterns and images are rendered on the paper.

1.5. Standard Graphics

The standard graphics mode provides a number of operators for constructing a variety of filled shapes and lines. Using standard mode graphics, you can:

- Draw lines of any desired width
- Draw circles and rectangles
- Draw a variety of filled shapes, including boxes and arcs
- Draw pie charts

This is referred to as the standard graphics mode because it is a standard feature of all versions of Prescribe, not only Prescribe 2e.

Drawing Lines

Prescribe 2e provides a number of *Draw to* commands for drawing lines. These include:

- **DAP** (Draw to Absolute Position) draws a line to an absolute position in a Cartesian coordinate system whose origin (0,0) is at the intersection of the left and top margins.

- **DZP** (Draw to Zero-relative Position) draws a line to an absolute position in a Cartesian coordinate system whose origin (0,0) is at the intersection of the left and top edge limits of the paper.

- **DRP** (Draw to Relative Position) draws a line to a position specified as a horizontal and vertical displacement from the current cursor position.

- **DRPA** (Draw to Relative Position specified by Angle) draws a line to a position that is specified as a distance and angle from the current cursor position. Examples of these commands are given in the sections that follow.

Lines to Absolute Position

Begin with a simple task such as drawing a line between two arbitrary points on a page. Use the MAP and DAP commands to specify positions relative to the top and left margins.

This task has several distinct steps: selecting a line width, determining the starting point of the line, and determining the end point of the line. The following command sequence demonstrates this process.

```
!R! RES;
    STM 0.5;
    SLM 0.5;
    SPD 0.01;
    MAP 0.5, 1;
    DAP 2, 0.5;
    PAGE;
EXIT;
```

Result of Draw Commands: Absolute Lines

The initial **!R!** command switches the printer to the Prescribe 2e mode. Remember that this command must always precede each sequence of Prescribe 2e commands.

The **RES** (RESet) clears the current page from printer memory and re-establishes the printer's permanent defaults. Although you would not include this command in every sequence of Prescribe 2e commands, we include it in this example to ensure consistent results. As a standard practice, include the RES at the beginning and end of each job.

The STM and SLM set both the top and left margins to 0.5 inches (1.27 centimeters).

The **SPD** (Set Pen Diameter) command determines the thickness of lines. In the standard graphics mode, this setting determines the thickness of all lines drawn after the command is issued. In this example, the line width is set to 0.01 inches.

The starting point of the line is established with the **MAP** (Move to Absolute Position) command. This command moves the cursor to a point that is a specified distance from the top and left margins. In this example, the point specified is 0.5 inches from the left margin and 1 inch from the top margin.

If the margins are changed, the position specified by **MAP** also changes correspondingly.

On the next line of the program, the **DAP** (Draw to Absolute Position) command draws a line from the starting position to the point 2 inches from the left margin and 0.5 inches from the top margin.

Finally, **PAGE;** prints out the page, allowing us to look at the result of our work.

Zero-relative Lines

The line draw example below uses some new commands to draw another line.

```
!R! RES;
    SPD 0.01;
    MZP 0.5, 1;
    DZP 2, 0.5;
    PAGE;
EXIT;
```

Result of Draw Commands: Zero-relative Lines

The first two lines switch the printer to the Prescribe 2e mode, reset printer parameters, and set the line width to 0.01 inch. On the third line, the **MZP** (Move to Zero-relative Position) differs from the **MAP** (Move to Absolute Position) command in one respect: the position specified is in relation to the top and left edge page limits of the page, rather than in relation to the top and left page margins. **MZP** moves the cursor to the point that is 0.5 inches from the left edge limit and 1 inch from the top edge limit. Similarly, on the next line, **DZP** (Draw to Zero-relative Position) draws a line from the starting position to the point 2 inches from the left edge limit and 0.5 inches from the top edge limit.

Relative Lines

Another way to specify positions is in relation to the current cursor position. The following command sequence provides an example.

```
!R! RES;
    SPD 0.01;
    MRP 2, 1;
    DRP -1.5, -1;
    MRP 2, 1;
    DRP -1.5, -1;
    MRP 2, 1;
    DRP -1.5, -1;
    PAGE;
EXIT;
```

Result of Draw Commands: Relative Lines

In this command sequence, the Prescribe 2e mode begins with the **!R!**, resets the printer defaults to permanent settings with **RES;**, and establishes a pen width of 0.01 inches with the **SPD 0.01;**.

The **MRP** (Move to Relative Position) and **DRP** (Draw to Relative Position) specify positions in relation to the cursor's current position.

When the command sequence starts, the cursor is located at the intersection of the left and top margins. The command **MRP 2, 1;** on line 3 moves the cursor 2 inches to the right of its current position, and down 1 inch from its current position. Then the command **DRP -1.5, -1;** draws a line from that point to a point 1.5 inches to the left of the cursor position and 1 inch above it. The cursor winds up 0.5 inches to the right of the point where it started.

Lines 5 to 8 repeat the move-and-draw sequence two more times. This produces three parallel lines, as shown in the figure on the previous page.

Lines in Terms of Angles

Until now, all of our examples have specified positions in terms of Cartesian (*X*,*Y*) coordinates. This example illustrates drawing lines of specified lengths and angles.

```
!R! RES;
    SPD 0.01;
    MZP 5, 4;
    DRPA 2, 149;
    DRPA 2, 221;
    DRPA 2, 293;
    DRPA 2, 365; CMNT Equivalent to 5 degrees;
    DRPA 2, 437; CMNT Equivalent to 77 degrees;
    PAGE;
EXIT;
```

Result of Draw Commands: Lines in Angles

The first two lines of this command sequence initiates the Prescribe 2e mode, resets printer defaults to permanent settings, and sets the line width to 0.01 inches. Then the **MZP** command on line 3 moves the cursor to a point 5 inches to the right of the left edge limit and 4 inches below the top edge limit.

Next, **DRPA 2, 149;** on line 4 draws a line two inches long at an angle of 149 degrees. The angle is measured clockwise from the vertical axis. The subsequent **DRPA** commands draw additional 2-inch lines at angles that increase in increments of 72 degrees. As indicated by the CMNT (CoMmeNT) commands, angles that exceed 360 degrees are equivalent to the remainder of division of the angle by 360.

Drawing Boxes and Circles

Prescribe 2e provides two commands especially for drawing boxes (BOX command) and circles (CIR command).

Drawing Boxes

The BOX (draw BOX) command draws a box of a specified *width* and *height*. As with the line drawing commands, the thickness of the line used to draw the box is determined by the SPD (Set Pen Diameter) command.

The following command sequence draws a box.

```
!R! RES;
    UNIT C;
    SPD 0.1;
    MZP 3, 3;
    BOX 3, 4;
    PAGE;
EXIT;
```

An Example of a Box

Line 1 places the printer in the Prescribe 2e mode and resets printer parameters. The **UNIT C;** command on the second line sets the unit of measurement to centimeters, and the **SPD** (Set Pen Diameter) command on line 3 sets the line width to 0.1 centimeters. (If you omit these two commands, the printer will print using the default unit, inches; and the default line width, 3 dots.)

Next, the **MZP** command on line four moves the cursor to the point that is 3 centimeters to the right of the left edge limit and 3 centimeters below the top edge limit. This is the starting point from which the box is drawn.

On line 5, **BOX 3, 4;** draws a box with a *width* of 3 centimeters and a *height* of 4 centimeters.

The position of the box with respect to the cursor depends on the positive or negative value specified for *width* and *height*. The box is drawn to the right of the cursor if *width* is positive, and to the left of the cursor if *width* is negative. Similarly, the box is drawn below the cursor if *height* is positive, and above

the cursor if *height* is negative. This relation is illustrated in the figure that follows.

By default, the position of the cursor is not affected by this command. However, you can also specify an *option* parameter to make the cursor move to an adjacent or diagonally opposite corner of the box, down by one text line, or to the left margin on the next text line. The following figure shows some examples.

Cursor Positioning Options

BOX 4, 2, H; Moves the cursor to the horizontally adjacent corner

BOX 4, 2, V; Moves the cursor to the vertically adjacent corner

BOX 4, 2, E; Moves the cursor to the diagonally opposite corner

BOX 4, 2, L; Moves the cursor down one line

BOX 4, 2, N; Moves the cursor to the beginning of the next line (to the left margin)

Drawing Circles

The CIR (draw CIRcle) command draws a circle of a specified *radius* using the line thickness set by the **SPD** (Set Pen Diameter) command. The circle drawn is centered on the current cursor position; the position of the cursor remains unaffected. See the following example:

```
!R! RES;
    UNIT C;
    SPD 0.1;
    MZP 8, 8;
    CIR 1;
    CIR 2;
    CIR 3;
    PAGE;
EXIT;
```

Circles

Lines 1, 2 and 3 start Prescribe 2e mode, reset the printer to its default parameters, establish the unit of measurement as centimeters, and set the line width to 0.1 centimeters.

Next, the **MZP** command moves the cursor to the point that is 8 centimeters to the right of the left edge limit and 8 centimeters below the top edge limit.

Lines 5, 6, and 7 draw three circles with radii of 1, 2, and 3 centimeters.

Drawing Filled Shapes

The standard graphics mode provides two types of filled shapes: arcs and blocks. Such shapes are filled with one of the printer's predefined patterns, or with a user defined pattern.

Filled areas of other shapes can be printed using path mode graphics. For details, see the explanation starting on page 1-44.

A filled block consists simply of a rectangle of any desired dimensions. A filled arc is an area enclosed by an arc segment and the line segments extending from the ends of the arc to the center of the circle of which the arc is a part.

This section shows how to select a fill pattern and print a filled block or arc.

Drawing Filled Blocks

The following command sequence prints the block shown below.

```
!R! RES;
    UNIT P;
    MZP 72, 72;
    PAT 6;
    BLK 72, -144, H;
    PAGE;
EXIT;
```

A Filled Block

Lines 1 and 2 put the printer in the Prescribe 2e mode, reset printer parameters and set the unit of measurement to points. (One point is equal to $^{1}/_{72}$ inches.)

Next, the **MZP** command moves the cursor to the position 72 points to the right of the left edge limit and 72 points below the top edge limit.

The **PAT** (select fill PATtern) command on line 4 of the program selects the fill pattern. In this program, pattern number 6 is selected.

You can select from among any of the printer's 60 predefined fill patterns or choose to define a pattern using the XPAT (generate eXpanded PATtern) command. In either case, the selection is made with the PAT command. For 1200-dpi and 600-dpi models, the user can define the printing resolution (300, 600, 1200 dpi) of the pattern by giving a second parameter to the PAT command.

You can also select a shade of gray for filling the arc or block by using the GPAT (set Gray PATtern) command.

The BLK (draw filled-in BLocK) command on line 5 actually draws the filled in block. This command closely resembles the BOX command explained in the preceding section. However, whereas the BOX command draws a line around a rectangular area, the BLK command fills a rectangular area with the currently selected pattern.

As with the BOX command, the position of the rectangular area with respect to the cursor depends on the sign of the values specified for width and height. The box is drawn to the right of the cursor if width is positive, and to the left of the cursor if width is negative; and the box is drawn below the cursor if height is positive, and above the cursor if height is negative.

As with the BOX command, you can specify an option parameter to make the cursor move to a specified location after the box is drawn. (The cursor remains unmoved if the option parameter is omitted.) Values for this option are H, V, E, L, N, and B, the same as for BOX.

Drawing Filled Arcs

The **ARC** (draw filled-in ARC) command is similar to the BLK command (described in the preceding section) in that it fills an area with a pre-defined pattern or a shade of gray. The arc is drawn centered around the current cursor position. The dimensions of the arc are determined by user specified inner radius, outer radius, starting angle, and ending angle.

The following Prescribe demonstrates the ARC command.

```
!R! CMNT Enter Prescribe 2e mode;
    RES;      CMNT Reset printer parameters;
    UNIT C;   CMNT Set centimeters as unit;
    PAT 9;    CMNT Select pattern 9;
    MZP 8, 8; CMNT Move cursor to point that is 8
              cm;
              CMNT from left edge limit and;
              CMNT 8 cm from top edge limit;
    ARC 1, 2, 0, 90;
    PAGE;
EXIT;
```

A Filled Arc

The **ARC** command on line 8 of the command sequence draws an arc with an inner radius of 1 centimeter, an outer radius of 2 centimeters, a starting angle of 0 (straight up), and an ending angle of 90 degrees.

The **ARC** command does not draw a line around the boundary of the filled-in area.

Defining Your Own Fill Patterns

With a little work, you can construct your own fill patterns. You can generate 8 x 8 dot patterns using the FPAT (generate Fill PATtern) command, or 16 x 16 dot patterns using the XPAT (generate eXpanded fill PATtern) command. This section gives examples of both.

```
!R! RES;
    MZP 1, 1;
    FPAT 16, 40, 68, 130, 65, 34, 20, 8;
    BLK 1, 1;
    PAGE;
EXIT;
```

Line 4 of this command sequence prints a filled block using a fill pattern defined by the FPAT command on line 3.

Each of the eight numbers in the **FPAT** defines one row of an 8 x 8 dot pattern. The pattern follows:

Dot Pattern and a Filled Block

For this pattern, the numbers across the top indicate the value of each column. The numbers down the right side are the sums of the values of columns that contain black dots in that row.

Once this pattern has been defined by the FPAT command, it is used as the fill pattern until printer parameters are reset with RES, another pattern is selected with PAT, a different pattern is defined with FPAT, or a shade of gray is defined and selected by GPAT.

Now let's look at an example using the XPAT command.

The XPAT command uses the format,

XPAT *pattern-number; bit map;*

Note that the *pattern-number* parameter must be a value from 100 to 105 and followed by a **semicolon**, not a comma.

The following example demonstrates the XPAT command in a Prescribe 2e command sequence.

```
!R! RES;
    XPAT 100;
    @X0@|0Af0CC0FA8L@<X@6p@3p@3X@6L@<FA8CC0Af0@|0@X0;
    MZP 1, 1;
    PAT 100;
    BLK 1, 1;
    PAGE;
EXIT;
```

Lines 2 and 3 define the pattern shown in the figure on the next page, defining it as pattern 100. The **PAT** command on line 5 selects the pattern for use in fills. Line 6 prints the filled block.

Dot Pattern and a Filled Block

The pattern is 16 dots high and 16 dots wide, and is encoded as a series of 16-bit words. Each 16-bit word is encoded by three characters, representing the most significant six bits, the next six bits, and the least significant four bits, respectively, as shown on the next page.

You obtain the characters that define the pattern by dividing each row-work into sections of six, six, and four bits, calculating the numerical value of each section (referred to as *x*, *y*, and *z*, respectively), treating it as a binary number in which the white dots are zeroes and the black dots are ones. Then add 64 (decimal) to the values of the 6-bit sections and 48 to the values of the 4-bit sections. The result is the ASCII code of the character that represents that section.

Column value

If the character resulting for section *x* of any row is @ (indicating that all bits in that section are white), then that character may be omitted. If sections *x* and *y* are both @, then both characters may be omitted. However, if the result for section *y* is @ and that for section *x* is a character other than @, then no characters may be omitted. In terms of the program example above, what this means is that the bit map string,

```
@X0@|0Af0CC0FA8L@<X@6p@3p@3X@6L@<FA8CC0Af0@|0@X0;
```

may be shortened by four characters to:

```
X0|0Af0CC0FA8L@<X@6p@3p@3X@6L@<FA8CC0Af0|0X0;
```

Patterns defined by the XPAT command remain effective until they are redefined by another XPAT command, or until the printer is turned off.

Drawing Pie Charts

The standard graphics mode provides a convenient function for drawing pie charts. See the following example:

```
!R! RES; UNIT C; SPD .05;
    MZP 10, 10;
    PIE 2, 0, 10, 20, 30, 40;
    PAGE;
EXIT;
```

PIE Example

The **PIE** command uses the format,

PIE *radius, starting angle, size of slice, ...;*

In the example above, the *radius* is 2 centimeters (since we set the unit to centimeters with the **UNIT** command), and the starting angle is 0 degrees. Four pie slices are specified, with sizes of 10, 20, 30, and 40.

The printer automatically converts the slice sizes to angles totalling 360 degrees. Then it draws the first slice with a *cut* at the angle specified by the second parameter (0 degrees in our example, or straight up). The remaining slices are drawn in sequence clockwise around the circle. The line thickness used for drawing the circle and the lines between slices are designated by the **SPD** (Set Pen Diameter) command.

Any number of pie slice sizes can be specified, provided that the total length of the command does not exceed 255 characters, and that the sum of the pie slices does not exceed 9999. All numbers specified for slice sizes must be non-negative integers.

The **PIE** command does not fill in the slices with any fill pattern. The **PAT** command can be used to create shaded areas. The previous example is expanded to fill in the slices.

```
!R! RES; UNIT C; SPD .1;
    MZP 10, 10;
    PAT 19; ARC 0, 2, 0, 36;
    PAT 41; ARC 0, 2, 36, 108;
    PAT 43; ARC 0, 2, 108, 216;
    PAT 48; ARC 0, 2, 216, 360;
    PIE 2, 0, 10, 20, 30, 40;
    PAGE;
EXIT;
```

Pattern Filled PIE

This program first draws four filled arcs, each using a different fill pattern, then prints the pie chart over the arcs. Each arc has an inner radius of zero, an outer radius of 2 (the same as the pie chart), and a starting angle and ending angle that correspond to the relative size of the pie slices. Since the total size of the pie slices in the example is 100 (10+20+30+40), the angular extent of each arc is equal to 360 x *size of slice* /100. For example, the angular extent of the first arc is 360 x $^{10}/_{100}$ = 36 degrees. The starting angle of each arc equals the starting angle of the pie chart (0 degrees), plus the angular extent of all the preceding arcs. The ending angle equals the starting angle plus the angular extent of the arc.

1.6. Path Mode Graphics

With path mode graphics, images are constructed by defining lines and curves as *paths*, then rendering them as images by stroking along the paths or filling the area enclosed by them. Prescribe 2e provides a variety of path construction operators and painting operators for stroking or filling paths.

Path

In Prescribe 2e, a path is a set of straight or curved line segments, either connected or disconnected, that describes the shape and position of one or more objects or regions. Paths can be used to draw lines and curves and to specify boundaries of filled areas.

A path is *stroked* by drawing a line of arbitrary width along it. The line may be solid black, all white, or any intermediate shade of gray. It may also be a dashed line of any pattern of segment lengths.

A path is *filled* by painting the entire area that it encloses with a gray scale pattern, ranging from black to white, or with one of the printer's predefined patterns. In order to be filled, a path must be closed; that is, it must return to its starting point.

A path is constructed by means of one or more *path construction* operators. The path construction operators modify the current path, usually by appending to it. However, a path in itself does not produce any image on the page. Once a path has been constructed, it can be used to control the application of one of the painting operators of Prescribe 2e, defining the boundary of the area in which images can be printed.

There are no restrictions on the shape of a path. A single path may include multiple *closed* subpaths, representing several areas, and a path may intersect itself in an arbitrary manner.

The order of the segments that define a path is significant. A pair of line segments is said to connect only if they are defined consecutively, with the second segment starting where the first one ends. Non-consecutive segments that meet or intersect fortuitously are not connected.

A subpath is a sequence of connected segments. A path is made up of one or more subpaths. Subpaths may be either open or closed.

Path construction begins with a NEWP (NEW Path) command. Path construction ends with the CLSP (CLoSe Path) command or with any paint operator that paints the region enclosed by the path or draws a line along it (such as STRoKe or FILL).

Drawing Lines

The following example shows how to draw a line in the path mode.

```
!R! RES;
    NEWP;
    PMZP 1, 1;
    PDZP 2, 3;
    STRK;
    PAGE;
EXIT;
```

Drawing Lines in Path Mode

Line 1 of the program switches the printer to the Prescribe 2e mode and resets printer parameters, including the unit (to inches), line width (to 3 dots), and various other aspects of the graphics state.

Path construction begins with the **NEWP** command on line 2. This command empties the current path (if any), making it possible to start a new one. In doing so, it makes the position of the cursor undefined.

The **PMZP** (Path, Move to Zero-relative Position) command on line 3 moves the cursor to a position one inch from the top and left edge limits of the paper. The coordinates specified may be positive or negative.

On line 4, the **PDZP** (Path, Draw to Zero-relative Position) draws a line from the current cursor position to the position 2 inches from the left edge limit and 3 inches from the top edge limit. The cursor remains at this position after the line is drawn.

On line 5, the **STRK** command strokes the path onto the page.

After stroking the current path, the STRK command clears the path in the same manner as **NEWP** (start NEW Path).

Finally, **PAGE** prints out the page, allowing us to look at the result of our work and cancelling all changes made during the course of the program, then **EXIT** ends the Prescribe 2e mode.

Two Lines

The preceding example illustrated construction of a path between points specified in terms of absolute coordinates. The following program draws two lines, using both absolute coordinate specification and a new method: relative coordinate specification.

```
!R! RES;
    NEWP;
    PMZP 1, 1;
    PDZP 2, 3;
    PMRP .5, -1;
    PDRP -1, -1;
    SPD 0.04;
    STRK;
    PAGE;
EXIT;
```

Drawing Two Lines

The first four lines of this program are identical to the preceding example. Line 1 switches the printer to the Prescribe 2e mode and resets printer parameters, line 2 empties the current path, and lines 3 and 4 draw a line between two points that are specified in terms of absolute coordinates.

On line 5, the **PMRP** (Path, Move to Relative Position) command moves the cursor to the point half an inch to the right and one inch above the current cursor position; that is, the point at which the first line ends. Then the **PDRP** (Path, Draw to Relative Position) command on line 6 draws a line to the point 1 inch to the left of the new position and 1 inch below it.

The line thickness is changed to 0.04 inches by the SPD command on line 7.

Finally, the STRK command on line 8 strokes the path onto the page, PAGE prints out the page, and EXIT ends the Prescribe 2e mode.

Line Ends

The line end type determines how Prescribe 2e renders the ends of lines when they are stroked onto the page. Prescribe 2e provides three kinds of line ends. These include:

Line Ends

The default line end type is butt caps. You can switch from the current line end type to any of the other types with the **SCAP** command. This command uses the following format:

SCAP *line-cap mode;*

Values for *line-cap mode* include:

1 (for square caps)
2 (for butt caps)
3 (for round caps)

Use of this command is illustrated in the following example.

```
!R! RES;
    UNIT C; CMNT Sets unit to cm;
    NEWP;   CMNT Starts new path;
    SPD .5; CMNT Sets line width to .5 cm;
    SCAP 1; CMNT Sets square caps;
    PMZP 2, 2;
    PDZP 4, 4;
    SCAP 3; CMNT Sets round caps;
    STRK;
    PAGE;
EXIT;
```

Printout of SCAP Example

Note that the line is rendered with round caps, rather than with square ones. Although square caps is set before constructing the path, the line type is changed to round prior to stroking the path. Prescribe 2e refers to the line cap type when the current path is stroked onto the page, rather than while the path is being constructed. Therefore, the program above renders the line with round caps rather than square ones.

Line Joins

When a path consists of multiple connected line segments, the manner in which they are stroked onto the page depends on the current *line join* type.

Prescribe 2e provides four types of line joins. These are called *beveled, mitered, round,* and *notched*. These are illustrated below.

Joins

The default line join type is beveled. With beveled joins, connected line segments end with butt caps, and the notch at the larger angle between the segments is filled with a triangle.

With mitered joins, the edges of connected line segments are extended until they meet. This type of join is limited by the *miter limit* (explained below).

With round joins, connected line segments are joined with circular caps.

Notched joins leave a notch at the larger angle between the connected line segments.

You can switch from the current line join type to any of the other types with the **SLJN** (Set Line JoiN) command. This command uses the following format:

`SLJN` *line-join mode;*

Values for *line-join mode* include:

1 (for beveled joins)
2 (for mitered joins)
3 (for round joins)
4 (for notched joins)

Miter Limit

When using mitered line joins, the use of such joins is limited by the *miter limit*. The miter limit is the maximum ratio of the distance *l* between the inner and outer corners of a mitered join and the width *w* of the lines joined.

Miter Limit

Miter limit = maximum ratio of $^{L}/_{w} = {}^{1}/_{\sin}\,({}^{a}/_{2})$

If the angle at which lines join is such that this limit is exceeded, the lines are joined with a beveled join, rather than a mitered one.

The purpose of the miter limit is to prevent objectionably long spikes when lines join at small angles. The default miter limit is 10, which results in beveled joins at angles of less than about 11.5 degrees.

You can set any desired miter limit with the **SMLT** (Set Miter LimiT) command. This command has the following format.

`SMLT` *limit-value;*

Here are some representative *limit-values* and the corresponding angles at which the line join type switches between mitered and beveled.

limit-value	appox. angle
2	60
3	39
4	29
5	23
6	19
7	16
8	14
9	13

Dash Type

By default, the STRK command strokes paths with solid lines. However, you can also use a predefined pattern of alternating black and white to stroke paths. This makes it possible to stroke paths as dashed lines. You can also define your own dashed line patterns.

The **DPAT** (select Dash PATtern) command selects one of Prescribe 2e's ten predefined dash patterns, or one of 10 dash patterns that you can define yourself. This command uses the format:

DPAT *pattern-number;*

The following program illustrates use of this command.

```
!R! RES;
    UNIT C; CMNT Sets unit to cm;
    NEWP;   CMNT Starts new path;
    SPD .5; CMNT Sets line width to .5 cm;
    PMZP 2, 2;
    PDZP 4, 4;
    DPAT 5;
    STRK;
    PAGE;
EXIT;
```

Printout of the DPAT Example

In this program, the **DPAT** command selects the dash pattern with which the line is stroked.

Predefined dash patterns are selected by specifying values from 1 to 10 for *pattern-number*. (A value of 1 specifies solid lines.) User-defined patterns can be selected by specifying values from 11 to 20. The next section explains how to use the **SDP** (Store Dash Pattern) command to define your own dash patterns. Specifying an undefined user pattern number results in solid black lines.

User Defined Dash Patterns

Using the SDP command, you can define your own dashed patterns for use in stroking lines, arcs, and curves. See the following example:

```
!R! RES;
    UNIT P;
    SDP 11, 2, 2, 5, 2;
    UNIT C; CMNT Sets unit to cm;
    NEWP;   CMNT Starts new path;
    SPD .5; CMNT Sets line width to .5 cm;
    PMZP 2, 2;
    PDZP 4, 4;
    DPAT 11;
    STRK;
    PAGE;
EXIT;
```

Printout of the SDP Example

The SDP command on line 3 defines a dashed pattern consisting of two lengths of black, two lengths of white, five lengths of black, and two lengths of white. On line 11, the DPAT command selects this pattern for stroking. The path defined by the PMZP (Path, Move to Zero-relative Position) and PDZP (Path, Draw to Zero-relative Position) commands is stroked using this pattern, with a result as shown in the figure on the previous page.

The **SDP** command uses the general format:

SDP *pattern-number, dash1, space1, dash2, space2, ..., dash10, space10;*

The value specified for *pattern-number* must be in the range from 11 to 20. Dash and space lengths are specified in pairs. Up to ten dash-space pairs can be specified. The dash length always comes first in each pair. If a pattern is to begin with a space, then specify 0 for *dash1*. However, if a pattern ends with a dash, the following *space* parameter can be omitted.

Dash patterns defined with this command remain valid until redefined with another **SDP** command, or until the printer is turned off.

Drawing Arcs and Curves

A path can include curves as well as lines. The **PARC** (Path, draw ARC) and **PCRP** (Path, Curve to Relative Position) commands make it possible to draw circular arcs and arcs of more complex form.

The **PARC** command uses the format:

PARC *x, y, radius, ang1, ang2;*

where *x* and *y* describe the zero-relative coordinates of the center of the arc, *radius* describes the radius of the arc, *ang1* describes the arc's starting angle, and *ang2* describes the arc's ending angle. Coordinates and radius are measured in the unit currently designated by the **UNIT** command, and the starting and ending angles are measured clockwise from the positive *x* axis.

The PARC command draws a line between the cursor position and the beginning of the arc. See the following example:

```
!R! RES; UNIT C; NEWP; SPD .1;
    PMZP 5, 5;
    PARC 5, 5, 3, 45, 135;
    STRK;
    PAGE;
EXIT;
```

Printout of the PARC Example

After the arc is drawn, the cursor is located at the end of the arc.

If you wish to eliminate the straight line segment in the above example, leaving only the arc, the cursor position must be moved in advance to the position at which drawing of the arc begins. This is shown in the following example, in which the cursor is moved to the coordinates as specified by the **PMRA** (Path, Move to Relative position specified by Angle) command prior to drawing the arc.

```
!R! RES UNIT C; NEWP; SPD .1;
    PMRA 5, 5, 3, 45;
    PARC 5, 5, 3, 45, 135;
    STRK;
    PAGE;
EXIT;
```

In this current example, the PMRA command moves the cursor from coordinates 5, 5, as measured from the left and top edge limits of the page, through the distance of 3 centimeters at the angle of 45 degrees from the positive x axis. At this point, the PARC command starts to draw the arc which ends at the angle of 135 degrees.

Printout of the PMRA Example

Circles can be constructed by drawing arcs with angular extents of 360 degrees. To draw a circle, you will also need a PMRA command to eliminate the line extending from the center of the circle to the beginning of the circle. See the following example:

```
!R! RES; UNIT C; NEWP; SPD .1;
    PMRA 3, 3, 1.5, 0;
    PARC 3, 3, 1.5, 0, 360;
    STRK;
    PAGE;
EXIT;
```

Printout of a Circle Made with PMRA

Drawing Complex Curves

Prescribe 2e also provides a second curve-drawing operator for constructing complex curves that are referred to as *Bézier* curve segments. The **PCRP** (Path, Curve to Relative Position) uses the following format.

PCRP *x1, y1, x2, y2, x3, y3;*

Bézier Curves

A Bézier curve segment is one that is geometrically defined by a starting point (the cursor's current position), two control points (*x1*, *y1* and *x2*, *y2*), and an ending point (*x3*, *y3*). Coordinates of each of these points are specified as an offset from the cursor's previous position.

The curve leaves the current position in the direction of *x1*, *y1*, and is tangent to the line between the current position and *x1*, *y1*. It bends towards *x2*, *y2*, then to *x3*, *y3*, and at the end point, is tangent to the line between x2, y2 and x3, y3. The curve is always entirely enclosed by the complex quadrilateral defined by the starting point, *x1*, *y1*, *x2*, *y2*, and *x3*, *y3*.

See the following examples:

```
!R! RES; UNIT C; NEWP; SPD .1;
    PMZP 3, 3;
    PCRP 4, 2, 5, 1.5, 6, 1.8;
    STRK;
    PAGE;
EXIT;
```

Printout of the PCRP Example

```
!R! RES; UNIT C; NEWP; SPD .1;
    PMZP 3, 3;
    PCRP 5.5, 1.5, 1.5, 5.5, 7, 7;
    STRK;
    PAGE;
EXIT;
```

Second PCRP Example

```
!R! RES; UNIT C; NEWP; SPD .1;
    PMZP 3, 4;
    PCRP 4, 2, 5, 4, 6, 2;
    STRK;
    PAGE;
EXIT;
```

Third PCRP Example

Setting the Flatness of Curves

When Prescribe 2e renders any curve, it actually converts the curve to a series of connected straight line segments. The length of these line segments is referred to as a curve's *flatness*. You can change the degree of flatness with the **FLAT** (set FLATness) command. The default flatness is 1 (dot). Setting smaller values of flatness results in smoother curves, but more time is required for computing the larger number of line segments involved. (The difference is not noticeable for a single curve, but can be substantial in highly complex pages.)

The following programs illustrate the results of setting the flatness to higher values.

```
!R! RES; UNIT C; NEWP; SPD .1;
    FLAT 30;
    PMZP 5, 5;
    PCRP 4, 2, 5, 4, 4, 0;
    STRK;
    PAGE;
EXIT;
```

Curve with Flatness 30

```
!R! RES; UNIT C; NEWP; SPD .1;
    FLAT 60;
    PMZP 5, 5;
    PCRP 4, 2, 5, 4, 4, 0;
    STRK;
    PAGE;
EXIT;
```

Curve with Flatness 60

Both of these programs draw an identical curve. The only difference between the two is in the flatness, which is specified on line 2.

Closed Paths

When the end point of a path connects to its starting point, the path is said to be *closed*. A closed path can be stroked, in the same manner as an open path, or it can be filled with gray-scale shading or a standard mode fill pattern.

Simply ending a path at the path's starting point does not make it a closed path; such a path remains open until it is closed. Closure can be done either explicitly, by means of the **CLSP** (CLoSe current Path) command, or implicitly by means of the **FILL** command.

The following example illustrates construction and closure of a path.

```
!R! RES; UNIT C; NEWP; SPD .5;
    PMZP 4, 2;
    PARC 3, 3, 1, 90, 270;
    PARC 5, 3, 1, 270, 90;
    CLSP;
    STRK;
    PAGE;
EXIT;
```

In this example, the PMZP command on line 2 places the current cursor at coordinates 4, 2, where the subsequent PARC command automatically starts to draw a line extending to the beginning of the arc. The PARC command then draws an arc from 90 degrees (straight up) to 270 degrees (straight down) around the center at coordinates 3, 3. After the arc is drawn, the cursor is located at the end of the arc. Then the PARC command on line 4 draws an arc from 270 degrees to 90 degrees around the center at coordinates 5, 3. Because the cursor position is defined at the end of the first arc when construction of the second arc starts, the second PARC command draws a line between the end of the first arc and the beginning of the second one. Finally, the CLSP command on line 5 explicitly closes the path, thereby constructing a line between the end of the second arc and the beginning of the first one.

Now the path has been closed. The STRK command goes on to stroke the path, producing the shape shown below.

A Closed Path

Filled Areas

```
!R! RES; UNIT C;
    NEWP;
    GPAT .5;
    PMZP 4, 2;
    PARC 3, 3, 1, 90, 270;
    PARC 5, 3, 1, 270, 90;
    FILL 1;
    PAGE;
EXIT;
```

This program is similar to the previous one. In this case, we choose to fill the path instead of stroking it. We select a shade of gray for filling the path (.5, a value directly between black and white) with the **GPAT** (set Gray PATtern) command on line 3.

First, we construct the path by drawing arcs around the center points. However, we will not close it explicitly.

Then we execute the **FILL** command. This implicitly closes the path, drawing a line between the ending point of the second arc and the starting point of the first one, then fills the closed path with the selected gray scale pattern.

Note that we could have filled the path with a standard mode fill pattern instead of a gray-scale pattern. The only change necessary would be to replace the GPAT command on line 3 with a PAT or FPAT command specifying the pattern to be used.

The format of the FILL command is

`FILL` *rule;*

The *rule* parameter specifies the convention according to which the path is filled.

With simple convex paths such as that shown below, the entire enclosed area is filled.

Simple Filled Paths

However, when a path consists of multiple closed subpaths or intersects itself as shown in the next two figures, the rule determines areas that are deemed to be inside the path.

```
!R! RES; UNIT C;
PMZP 5, 5;
PMRA 5, 5, 2, 0;
PARC 5, 5, 2, 0, 360;
PMRA 5.2, 5.2, 1.5, 0;
PARC 5.2, 5.2, 1.5, 0, 360;
PMRA 5.5, 5.5, 1, 0;
PARC 5.5, 5.5, 1, 0, 360;
FILL 1;

PMZP 10.5, 4.5;
PMRA 10.5, 4.5, 2, 0;
PARC 10.5, 4.5, 2, 0, 360;
PMRA 11, 6, 2, 0;
PARC 11, 6, 2, 0, 360;
PMRA 12, 5, 2, 0;
PARC 12, 5, 2, 0, 360;
FILL 1;

PAGE;
EXIT;
```

Complex Filled Paths

With 1 specified for the rule parameter of FILL, the method for determining whether a point is inside the path involves drawing a ray from that point in any direction and counting the number of times the ray crosses segments of the path. The point is said to be inside the path if the result is an odd number; if the result is an even number, the point is said to be outside the path.

The non-zero winding rule also draws a ray from a point in any direction to determine whether or not that point is inside the path and examines the points where a segment of the path crosses the ray. However, it then starts counting from zero and adds one each time a segment in the path crosses the ray from left to right; and subtracts one each time a segment in the path crosses the ray from right to left. If the result of counting all the crossings is zero, the point is said to be outside; otherwise the point is said to be inside the path.

After filling the current path, the FILL command clears the path in the same manner as NEWP.

Clipping Rectangle

Up to this point, we have discussed graphics objects to be drawn or stroked or filled as paths. However, another Prescribe 2e command can be used to define a clipping template for clipping texts, paths, and raster graphics. For this purpose, the **CLPR** (CLiP Rectangular region) command is provided to define the rectangular region for clipping paths.

When the printer is turned on or reset with Prescribe 2e's RES command, the clipping rectangle is identical to the printable limits of the page. Subsequently, executing the CLPR command reduces the clipping rectangle to the intersection of the objects on the page and the rectangle defined by CLPR.

The following is an example of CLPR.

```
!R! RES; UNIT C;
    NEWP;
    SPD 1;
    PMRA 6, 9, 3, 0;
    PARC 6, 9, 3, 0, 360;
    CLPR 3, 6, 9, 12;
    STRK;
EXIT;
```

In this example, lines 1 through 5 draw a circle with an extra line thickness at the coordinates defined by the PMRA command.

The CLPR command on line 6 constructs a rectangle with its left-upper corner positioned at coordinates 3, 6 and its right-bottom corner positioned at coordinates 9, 12 (both measured from the top and left edge limits of the page).

As with the rectangular area clipping, those parts of the circle that lie outside of the clipping rectangle are erased when the path is stroked, producing the result as shown in the figure on the next page.

The rectangle defined by CLPR does not clip the graphics objects which are drawn by the standard mode graphics commands.

Clipping Rectangle Example

Printing with Character Paths

When a resident scalable (outline) font is selected, you can treat a character as a path and add it to the current path. The Prescribe 2e command is **CPTH** (Character PaTH).

Paths created with the CPTH command can be either stroked or filled. See the following example.

```
!R! RES;
UNIT P;
NEWP;
PAT 26;
SFNT 'Swiss742SWC-Bold', 54;
PMZP 72, 144;
CPTH "xyz";
FILL 1;
PAGE;
EXIT;
```

Character Path

Line 2 of this program sets the unit to printer's points (1 point= $^{1}/_{72}$ inch), then the NEWP command on line 3 empties the current path (if any), making ready for construction of a new path. The PAT command on line 4 selects predefined pattern number 26 as the current fill pattern.

Next, the **SFNT** (Select current FoNT by typeface) on line 5 selects Swiss742SWC-Bold, a scalable (outline) font as the current font and scales the font to a height of 54 points. Use of SFNT and other font selection commands are explained more fully in the next chapter.

The PMZP command on line 6 moves the cursor to the point that is 72 points (1 inch) from the left edge limit and 2 inches from the top edge limit.

The CPTH command on line 7 constructs a path using the outline of the characters in the string *xyz*. The cursor is moved to the end of the string.

Finally, the FILL command fills the path with the selected pattern, and PAGE prints out the page.

1.7. Raster Graphics

While the graphics commands of the standard and path modes draw shapes such as lines, circles, and boxes, raster graphics commands specify individual dots to draw images. The dot resolution is selectable from 75 to 300 dots per inch for all models; and 600-dpi models have two more choices of 200 dpi and 600 dpi. Lower resolutions give a rougher appearance, but require less raster data for an image of a given size.

Raster graphics are limited in size only by the dimensions of the paper, and in complexity only by the dot resolution.

Raster Data Compression Formats

Prescribe 2e supports raster data in three formats: uncompressed raster data, run-length encoded raster data, or raster data encoded in tagged image file format (TIFF).

Uncompressed Raster Data

Uncompressed raster data consists of a simple, unencoded bit image consisting of binary data in which *1* bit represent black dots and *0* bit represent white dots. With this format, each dot line is divided into 8-dot segments. The settings of dots in each segment are controlled by the bit values of each byte of raster data. Bit 7 (the highest-order bit in the first byte of data received) corresponds to the first dot in the dot line, bit 0 corresponds to the eighth dot, and so forth.

Run-length Encoded Raster Data

With run-length encoding, raster data is encoded in pairs of bytes. The first byte of each pair indicates a repetition count for the second byte. A value of zero in the first byte indicates that the pattern represented in second byte is not repeated; that is, it occurs only once. A value of 1 in the first byte indicates that the pattern is repeated once, and so forth. The first byte can specify any repetition count from 0 to 255.

Raster Data in Tagged Image File Format

The tagged image file format (TIFF) combines features of the uncompressed format and run-length encoding. A *control byte* determines whether the following byte or bytes of raster data represents a repeating pattern or an uncompressed (unencoded) pattern. It also determines the number of pattern repetitions or bytes of uncompressed data.

The control byte is a two's complement value that can be either zero, positive, or negative. A negative value (-1 to -127) indicates that the following byte represents a repeating pattern. The number of repetitions of the pattern is determined by the absolute value of the control byte.

If the control byte is zero or positive (1 to 127), the following byte(s) of data represent an uncompressed pattern. In this case, the value of the control byte plus one indicates the number of bytes making up the pattern.

In TIFF encoding, the two's complement value -128 indicates a non-operative control byte. The byte following such a byte is handled as a new control byte.

Commands for Printing Raster Data

Prescribe 2e provides a number of commands for printing raster data, including:

STR (SeT dot Resolution)
RVRD (ReceiVe Raster Data)
ENDR (END Raster data)
RVCD (ReceiVe Compressed raster Data)
SRO (Set Raster Options)

The principle function of the **SRO** command is to specify the *presentation mode*; i.e., the orientation of the raster image. If the presentation mode is *0* (the default mode), raster lines print along the width of the physical page, regardless of the current page orientation. If the presentation mode is *1*, raster lines print in the orientation of the logical page. This is illustrated in the figure that follows.

Presentation Modes

(Presentation mode = 0)

(Presentation mode = 1)

A secondary function of the SRO command specifies the width and height of the raster area. When a width and height are explicitly specified, any part of the raster image that extends outside of the area is clipped.

The STR command specifies the resolution at which raster data is printed. The default resolution is 75 dots per inch, or the equivalent of 16 physical dots for each raster-line dot. The following figure shows how a single raster-line dot correlates to physical printer dots at each of the available raster data resolutions.

Dot Resolutions

The **RVRD** and **RVCD** commands print raster data in the presentation mode specified by the SRO command and at the resolution specified by the STR command. Either command can be used. The RVRD command can only print uncompressed raster data. The RVCD command can print uncompressed raster data, run-length encoded raster data, or tagged image file format raster data. Both commands are used with the ENDR (END Raster) command.

Printing Raster Data

The normal sequence for printing raster data is to set the presentation mode (and, if desired, the height and width of the raster image area) with the SRO command, to set the dot resolution with the STR command, then to print the raster data with the RVRD or RVCD/ENDR command pair.

Changing the Printer's Imaging Model

The printer's imaging model governs the way in which images and patterns are applied to each other. In short, it determines the transparency or opaqueness of images as images overlay one another and fill patterns are applied through images.

The image model applies to all Prescribe 2e image modes, and also to printer operation in the Hewlett-Packard LaserJet emulation mode.

In general, placing any image on a page involves three elements: *a pattern, a source image* whose black bits are replaced by the pattern, and *a destination image*, which is any earlier image onto which the source image and pattern are placed.

The fill pattern or gray scale pattern is defined by the PAT command, FPAT command, or GPAT command.

The source image is any raster graphics image, standard mode graphic, lines or shapes produced by filling or stroking a path, or text printed using any bitmap or scalable font.

The manner in which white bits in the pattern and source image are processed varies according to the *transparency mode*. There are two transparency modes: the *source transparency mode* and the *pattern transparency mode*.

When the source transparency mode is *0* (transparent), white bits in the source image have no effect on the destination image; when the source transparency mode is *1* (opaque), white bits in the source image are applied to the destination image.

Similarly, when the pattern transparency mode is *0* (transparent), white bits in the pattern do not affect the destination image; but the area of the source image replaced by the pattern dots is applied to the destination image when the pattern transparency mode is *1* (opaque).

The figure on the next page illustrates the results that are obtained by printing images using image modes; that is, using different combinations of source and pattern transparency modes.

Image Models

Source transparency mode = 0
(transparent)
Pattern transparency mode = 0
(transparent)

Source transparency mode = 0
(transparent)
Pattern transparency mode = 1
(opaque)

Source transparency mode = 1
(opaque)
Pattern transparency mode = 0
(transparent)

Source transparency mode = 1
(opaque)
Pattern transparency mode = 1
(opaque)

Prescribe 2e establishes the printer's imaging model with the **SIMG** (Set IMaGe model) command. This command uses the following format.

`SIMG` *operation-mode;*

operation-mode is a number from 1 to 6 that determines the image model as follows.

Operation mode	Source image	Pattern
1	Transparent	–
2	Opaque	–
3	Transparent	Transparent
4	Transparent	Opaque
5	Opaque	Transparent
6	Opaque	Opaque

With operation modes 1 and 2, the SIMG command addresses the transparency of the source image only. For operation mode 1, the white pixels of the source image do not overlay on the destination. For example, you cannot pattern a character. With operation mode 2, the SIMG command applies the white pixels of the source image onto the destination directly.

The following program example illustrates use of the SIMG command. Try changing the value specified for `SIMG` on line 3 and see the effect on the result (the figure on the previous page).

```
!R! RES; UNIT C;
NEWP;
SIMG 3; CMNT Try changing this value;
PMZP 5, 15;
PMRP 2, 2;
PDRP 0, -2, 2, 0, 0, 2, -2, 0;
PDRP -2, 0, 0, 2, 2, 0, 0, -2;
FILL 1;
SFNT 'Dutch801SWC-Roman', 90;
PMRP -1.2, 1;
GPAT .6;
TEXT 'A';
FILL 1;
PAGE;
EXIT;
```

Saving and Restoring the Graphics State

The graphics state consists of a variety of items that affect how images are rendered on the page. The graphics state contains various information related to path mode graphics and raster mode graphics.

Items included in the graphics state include the following:

- Current path and cursor position (if defined)
- Current pen diameter (line width)
- Current line join type
- Current line cap type
- Current miter limit
- Current dash pattern
- Current flatness
- Current fill pattern (16 × 16 dots)
- Current clipping rectangle
- Current raster resolution
- Current image model

While working with graphics, there often are occasions when it is useful to save the graphics state, then later to restore it. One such situation occurs when a path must be used for both stroking and filling.

For example, construction of a filled and outlined shape such as that shown below requires that we draw the path and then fill it. However, filling the path also clears it, making it unavailable for stroking.

A Path both Stroked and Filled

By saving the graphics state prior to filling the path, it becomes possible to restore the path after it has been filled, thereby allowing it to be stroked without reconstructing it.

The commands used for saving and restoring the graphics state are the **SCG** (Save Current Graphics state) command and the **RPG** (Return to Previous Graphics state) command.

The following program demonstrates the commands for constructing a path that is both filled and stroked.

```
!R! RES; UNIT C; NEWP;
    PMZP 4, 2;
    PARC 3, 3, 1, 90, 270;
    PARC 5, 3, 1, 270, 90;
    CLSP;
    SCG;
    STRK;
    RPG;
    GPAT .5;
    FILL 1;
    PAGE;
EXIT;
```

The result appears in the figure on the preceding page.

Macros

After you have gone to the trouble of creating (and debugging) a Prescribe 2e command sequence, it is inefficient to use it only once, but it is a nuisance to type the same sequence repeatedly. The solution is to make the sequence into a macro. Then you can execute the entire sequence with a single **CALL** command. The procedure for defining a macro command sequence is simple.

Step 1: Assign a name to the sequence. Place the name at the top of the sequence (ending with a semicolon).

Step 2: Add the Prescribe command MCRO in front of the name.

Step 3: Add the Prescribe command ENDM at the end of the sequence.

1.8. MCRO Command

The **MCRO** command assigns a name to the sequence of Prescribe commands that follows, until the **ENDM** (END Macro) command appears. Thereafter, the entire sequence of commands can be executed by specifying the assigned name in a single CALL or **AMCR** (Automatic MaCRo) command. The MCRO command has the following format.

`MCRO` *name[dummy sign[, comment];*

The *name* of a macro can be any length but only the first four characters are recognized by the Prescribe command language. Any distinction between upper and lowercase letters is also ignored. For example, the following macro names are all the same:

```
ABCD
abcd
ABCDE
Abcdxyz
```

The name must start with a letter, but the other characters can include digits and special symbols such as hyphens. For example, `F-1` and `GRY2` are valid macro names.

The *dummy sign* (the default is the percent sign) indicates dummy parameters in the body of the macro. Dummy parameters enable you to place different variables when the macros are called. By using dummy parameters the same macro will execute differently according to the values given on the CALL command. Dummy parameters are written by writing the dummy sign followed by a number: *%1* for the first dummy parameter, *%2* for the second dummy parameter, and so on up to a maximum of 19 dummy parameters. The same dummy parameter can be used any number of times. Values are assigned to dummy parameters when the macro is called by the CALL command.

You do not have to specify the dummy sign in the MCRO command unless you want to use a dummy sign different from the percent sign or want to specify a comment. The printer ignores the comment. A useful comment would be a list of the meanings of dummy parameters. In particular, a macro can contain the CALL command, permitting one macro to call another. Macro calls can be nested in this way up to a maximum depth of 20.

Note: **If the body of the macro contains TEXT, RTXT, or CTXT commands and these have dummy parameters, the enclosing quotation marks should be included in the macro call, not in the macro definition. This enables strings containing commas, semicolons, consecutive spaces, apostrophes, and quotation marks to be printed.**

If a macro with the same name has already been defined, the new definition is ignored. To redefine a macro, you must first delete the old definition with the **DELM** (DELete Macro) or **DAM** (Delete All Macros) command, or by switching the printer power off.

There is no particular limit on the length of a macro. The maximum number of macros that can be defined is limited only by the amount of the available memory in the printer. Each command in a macro is limited to 255 characters in length.

Prescribe Macro Limitations

Macro limitations are summarized as follows.

Maximum number of macros downloadable to the printer	Depends on the available printer memory
Maximum nesting levels	20
Maximum length of macro name	4 characters
Maximum number of parameters	19
Maximum length of CALL command	255 bytes
Prescribe 2e commands that should not be contained within a macro definition	EXIT, LDFC, MCRO, DELM, DAM, RDMP, ENDD, ICCD, WRED, EPRM

1.9. Examples of Macros

Example 1

The following macro example draws a circle. It first names the macro that issues the Prescribe commands for drawing a circle in the middle of a page.

```
!R! MCRO CIR1;
    MZP 4, 5.5; CIR 1;
    ENDM;
EXIT;
```

When completed, this macro will draw a circle after it has been sent to the printer.

```
!R! CALL CIR1; EXIT;
```

If you want circles of different sizes, you can make the radius into a so-called *dummy parameter*. Dummy parameters in macro definitions are denoted using percent symbols (%) as below:

```
!R! MCRO CIRCLE;
    MZP 4, 5,5; CIR %1;
    ENDM;
EXIT;
```

After this definition: `CALL CIRCLE, 1;` draws a one-inch circle, `CALL CIRCLE, 2;` draws a two-inch circle, and so on. Note the commas are required to separate the macro name from the radius parameter in these CALL statements.

Example 2

The next file presents a more ambitious project. It makes the graph-drawing commands in the preceding section into a pair of macros to draw multiple graphs. This file may help you to better understand the macro creating process. The DAM command in the first line is a safety precaution that clears any previous macros out of memory.

```
!R! RES; UNITC; DAM;
    MCRO LOCATE;
      SLM %1;
      STM %2;
    ENDM;
    MCRO GRAPH;
      UNIT C;
      SPD 0.05; SCS 0.23;
      MAP 0, -7.3; TEXT %1;
      MAP 0, 0; BOX 6, -7;
      MAP -0.1, 0.5;
      TEXT 'Sun Mon Tue Wed Thu Fri Sat';
      MAP 0, -%2;
      DAP 1, -%3;
      DAP 2, -%4;
      DAP 3, -%5;
      DAP 4, -%6;
      DAP 5, -%7;
      DAP 6, -%8;
    ENDM;
    CALL LOCATE, 2, 9;
    CALL GRAPH, 'Temperature', 2.5, 3.5, 1.9, 3.0, 3.8, 2.8, 3.3;
    CALL LOCATE, 10, 9;
    CALL GRAPH, 'Humidity', 3.5, 1.0, 1.3, 2.6, 1.8, 6.4, 5.9;
    CALL LOCATE, 2, 20;
    CALL GRAPH, 'Paid Attendance', 5.2, 1.1, 0.9, 1.5, 1.3, 3.3, 4.4;
    CALL LOCATE, 10, 20;
    CALL GRAPH, 'Pages Completed', 0, 1.2, 4.4, 4.6, 3.2, 6.6, 0;
    PAGE;
EXIT;
```

Macro Example 2

Chapter 2

Prescribe 2e Command Reference

Prescribe 2e is an extended version of the standard Prescribe command language. It includes all of the standard features of Prescribe and also provides HP LaserJet compatible scalable fonts and a greater degree of graphic freedom, including the ability to draw object by constructing and manipulating paths consisting of lines and curves.

In the command format descriptions below, the command is written in fixed-pitch `CAPITAL` letters. Parameters are indicated in lowercase *italics*. Optional parameters, which may be omitted, are enclosed in brackets [ ]. Three dots (...) mean that the preceding parameters may be repeated.

Except for the initial !R!, Prescribe 2e commands may be written in lowercase letters if preferred.

Example:

```
!R! sfnt 'Swiss721BM8-Roman'; exit;
```

Refer to *Chapter 1* for the discussion on how Prescribe 2e follows the rule regarding upper- and lowercase letters.

Unless otherwise specified, the sample printouts appear in 300 dpi resolution.

The functions of some Prescribe 2e commands are duplicated by the panel keys. For example, the same status page can be printed by the STAT command or by pressing the STATUS key. The *User's Manual* provides a full description of the control panel functions.

Many Prescribe 2e commands can be embedded commands within word processing software. This support depends upon the emulation mode and the software. See *Chapter 6*.

Note: **For details on the Prescribe 2c command set for color printers, refer to Chapter 8.**

2.1. Overview of Prescribe 2e Commands by Function

Support for certain commands varies depending on the printer model.

1. Access Commands

These commands provide access in and out of Prescribe 2e mode.

Command	Function	Page
!R!	Prescribe start sequence	2-221
EXIT	EXIT from Prescribe mode	2-107
SCRC	Set Command Recognition Character	2-274

2. Printer Setting Commands

These commands establish general printing environment parameters.

Command	Function	Page
CASS	select CASSette or manual feed	2-43
COPY	set number of COPIES	2-58
EPL	select EcoPrint Level	2-103
FDIR	MP tray Feed DIRection	2-109
FRPO	Firmware RePrOgram	2-122
FRPO INIT	FRPO-INITialize	2-124
FSET	change current Font SETting by characteristic	2-126
MDAT	set MeDia type ATtribute	2-166
MTYP	select Media TYPe	2-178
PSRC	select Paper SouRCe	2-217
RES	RESet	2-225
RESL	select RESoLution	2-228
RGST	offset ReGiSTration	2-229
RPU	Return to Previous Unit	2-238
SCU	Save Current Unit	2-278

Command	Function	Page
SEM	Set Emulation Mode	2-283
SIR	Set Image Refinement level	2-300
SPSZ	Set Paper SiZe	2-323
STAK	select paper STAcKer	2-337
STAT	STATus	2-339
UNIT	set UNIT of measurement	2-354
UOM	Unit Of Measurement	2-356

3. Page Control, Text, and Comment Commands

The placement commands determine where text will be placed on the page.

Command	Function	Page
CMNT	CoMmeNT	2-56
CTXT	print Centered TeXT	2-68
PAGE	start new PAGE	2-184
RTTX	RoTate TeXt	2-239
RTXT	print Right-aligned TeXT	2-241
TEXT	print TEXT	2-351

4. Margin and Page Portrait/Landscape Orientation Commands

These commands are used to set the top, bottom, right, and left margins, and to specify portrait or landscape page orientation. Normal text data is printed inside the margins, but the TEXT and RTEXT commands can be used to print character strings or graphics anywhere in the entire printable area of the page, regardless of the margin settings. There are several commands for setting margins, so it is possible to select the one that best suits the purpose at hand. Margin settings can be changed in the middle of a page.

Note that the following limitations apply to the margin setting commands.

- The right margin must be at least one space character to the right of the left margin.
- The bottom margin must be at least one line below the top margin.
- It is not possible to specify negative values as margin settings.

For example, a right margin setting beyond the printable area's right edge would be brought back just inside the right edge of the printable area. In like manner, it is not possible to use a bottom margin setting that would place the bottom margin past the bottom edge of the printable area. An easy way to set the right and bottom margins to the very edge of the printable area is to use a large value such as 100 (centimeters). **Note that Prescribe 2e command settings are not necessary when application software supports any of the features.** The SPO command is used to select portrait or landscape page orientation. The margins and page orientation can be reset by using the RES command.

Command	Function	Page
SBM	Set Bottom Margin	2-260
SLM	Set Left Margin	2-303
SLPP	Set Lines Per Page	2-307
SPL	Set Page Length	2-317
SPO	Set Page Orientation	2-320
SPW	Set Page Width	2-326
SRM	Set Right Margin	2-328
STM	Set Top Margin	2-342

5. Text Spacing Commands

These commands control the line spacing, character spacing, underline spacing, and underline thickness. The SLS and SLPI commands are used to set the line spacing. The SCS and SCPI commands are used to set the character spacing. These spacing settings may be changed even in the middle of a page.

The table below lists the minimum, maximum, and default values for the text spacing command parameters.

	Minimum value	Maximum value	Default value
Line spacing	1 dot 0.01 cm 0.004 inch	2,047 dots 17.3 cm 6.8 inch	6 lpi 0.423 cm 0.167 inch
Character spacing	1 dot 0.01 cm 0.004 inch	2,047 dots 17.3 cm 6.8 inch	10 cpi 0.254 cm 0.1 inch

If values outside of the above ranges are used, the command is ignored.

If a value smaller than one dot is specified for the character spacing, it is interpreted as 0, which results in proportional spacing.

Using the font mode (FTMD command), the line spacing and character spacing can be set automatically when the bitmap fonts are selected. Refer to the sections on the FTMD and SFA commands for additional details.

Command	Function	Page
SCPI	Set Characters Per Inch	2-272
SCS	Set Character Spacing	2-276
SLPI	Set Lines Per Inch	2-305
SLS	Set Line Spacing	2-310
SULP	Set UnderLine Parameters	2-349

6. Font Commands

The font commands are used to select fonts. Fonts can be selected using substitute numbers instead of a font's specific number. It is also possible to change the attributes of fonts and print them in a unique style. Additionally, there are commands to download fonts to the printer from an external source, and to generate fonts.

Command	Function	Page
ALTB A	[ALlocate TaBle] Assign code translation table	2-14
ALTB C	[ALlocate TaBle] Convert character code	2-15
ALTB D	[ALlocate TaBle] Delete code conversion table	2-16

Command	Function	Page
ALTB E	[ALlocate TaBle] End defining combination characters	2-17
ALTB G	[ALlocate TaBle] Generate user-defined table	2-18
ALTB R	[ALlocate TaBle] Release code translation table	2-19
ALTB S	[ALlocate TaBle] Start to define combination character	2-20
ALTB T	[ALlocate TaBle] define combined character data by Table	2-22
ALTF	change to ALTernate Font	2-24
ASFN	ASsign FoNt	2-32
CSET	Change symbol SET by symbol-set ID	2-62
DAF	Delete All Fonts	2-70
DELF	DELete Font	2-76
FLST	print Font LiST	2-115
FONT	change current FONT	2-117
FSET	change current Font SETting by characteristic	2-126
FTMD	bitmap FonT MoDe	2-132
INTL	InterNaTionaL characters	2-140
LDFC	LoaD Font Character	2-151
LDFN C	generate bitmap character for LoaDing FoNt	2-154
LDFN F	create header for LoaDing FoNt	2-156
LDFN S	LoaD truetype FoNt	2-158
RPCS	Return to Previous Code Set	2-231
RPF	Return to Previous Font	2-232
SCCS	Save Current Code Set	2-264
SCF	Save Current Font	2-266
SETF	SET alternate Font	2-285
SFA	Set bitmap Font Attributes	2-287
SFNT	Select current FoNT by typeface	2-292
TPRS	Text PaRSing method	2-353

7. Cursor Movement Commands

These commands move the cursor to specific positions. Cursor movements can be established for absolute positions based on the margins, zero point positions based on the printable area, or relative positions based on the current cursor position.

Cursor movement commands only change the position of the cursor. Also, the cursor may not be moved outside of the printable area (see MZP command). It is possible to store the cursor position in memory then to return to that position stored in memory.

Command	Function	Page
MAP	Move to Absolute Position	2-160
MRP	Move to Relative Position	2-172
MRPA	Move to Relative Position specified by Angle	2-174
MZP	Move to Zero-relative Position	2-180
RPP	Return to Previous Position	2-236
SCP	Save Current Position	2-270

8. Vector Graphics Commands

The commands below can be used to create figures such as lines, circles, and rectangles, and to add shading, simply by adding parameters.

If an attempt is made to create figures outside of the printable area using these commands, the coordinates are adjusted automatically so that the figures print inside the printable area. As in the example below, this can produce printed results different from what is expected.

Printing extremely complex figures can exhaust printer memory. Downloadable fonts can be particularly taxing on printer memory, producing unexpected print results. It may be possible

to correct the problem by removing some of the downloaded fonts or by simplifying the graphic. To determine current memory usage, refer to a status page.

Command	Function	Page
ARC	draw filled-in ARC	2-29
BLK	draw filled-in BLocK	2-37
BOX	draw BOX	2-39
CIR	draw ClRcle	2-49
DAP	Draw to Absolute Position	2-74
DPAT	select Dash PATtern	2-81
DRP	Draw to Relative Position	2-84
DRPA	Draw to Relative Position specified by Angle	2-86
DZP	Draw to Zero-relative Position	2-92
FPAT	generate Fill PATtern	2-119
GPAT	set Gray PATtern	2-135
PAT	select fill PATtern	2-188
PIE	draw PIE chart	2-205
SPD	Set Pen Diameter	2-315
XPAT	generate eXpanded fill PATtern	2-361

9. Path Mode Graphics Commands

The following commands provide a variety of path construction operators and painting operators for stroking or filling paths.

Command	Function	Page
CLIP	CLIP current path	2-51
CLPR	CLiP Rectangular area	2-52
CLSP	CLoSe Path	2-54
CPTH	Character PaTH	2-60
FILL	FILL closed path	2-110
FLAT	set FLATness	2-113
NEWP	start NEW path	2-182
PARC	in Path, draw ARC	2-186
PCRP	in Path, Curve to Relative Position	2-190
PCZP	in Path, Curve to Zero-relative Position	2-193
PDIR	set Print DIRection	2-195
PDRP	in Path, Draw to Relative Position	2-198

Command	Function	Page
PDZP	in Path, Draw to Zero-relative Position	2-200
PELP	in Path, draw ELlipse	2-202
PMRA	in Path, Move to Relative position specified by Angle	2-207
PMRP	in Path, Move to Relative Position	2-209
PMZP	in Path, Move to Zero-relative Position	2-211
PRBX	in Path, draw Round Box	2-213
PRRC	in Path, at Relative position, draw aRC	2-215
PXPL	PiXel PLacement	2-219
RPG	Return to Previous Graphics state	2-234
SCAP	Set line CAP	2-262
SCG	Save Current Graphics state	2-268
SDP	Store Dash Pattern	2-281
SIMG	Set IMaGe model	2-296
SLJN	Set Line Join	2-301
SMLT	Set Miter LimiT	2-312
SROP	Set Raster Operation	2-332
STRK	STRoKe current path	2-347

10. Raster Graphics Commands

Raster graphics commands can be used to draw any graphic design by specifying the individual dots. The dot resolution is selectable from 75, 100, 150, 200, 300, 600, and 1200 dots per inch (200 and 600 dots per inch resolutions are available only for printers with a resolution of 600 dpi or greater).

Command	Function	Page
ENDR	END Raster data	2-101
PXPL	PiXel PLacement	2-219
RVCD	ReceiVe Compressed raster Data	2-243
RVRD	ReceiVe Raster Data	2-245
SRO	Set Raster Options	2-330
SROP	Set Raster OPeration	2-332
STR	Set dot Resolution	2-346

11. Barcode Command

Barcodes conforming to various specifications can be printed simply by specifying the type of barcode and the barcode data. It is also possible to print barcodes with check digits added.

Command	Function	Page
BARC	draw BARCode	2-35

12. Macro Commands

A series of Prescribe 2e commands can be defined for sequential processing as a macro. Macros are selected using the CALL command and automatically using the AMCR command.

Command	Function	Page
AMCR	call Automatic MaCRo	2-26
CALL	CALL macro	2-41
CCPY D	Carbon CoPY Disable	2-45
CCPY E	Carbon CoPY Enable	2-46
DAM	Delete All Macros	2-72
DELM	DELete Macro	2-78
EMCR	Enable MaCRo by paper input	2-94
ENDC	END Carbon Copy	2-96
ENDM	END Macro	2-98
MCRO	define MaCRO	2-162
MLST	print Macro LiST	2-170

13. Debug Command

These commands can be used to check the print data in hexadecimal format for print jobs with unexpected output.

Command	Function	Page
ENDD	END Dump	2-97
RDMP	Received-data DuMP	2-223

14. Memory Card/Option EPROM Control Commands

If an external storage, such as JEIDA Ver. 4 memory card, is installed in the printer, the following commands can be used to write data to or read from it. These commands do not apply to the printer models that do not have an external storage. The EPRM command is used to read the contents of the EPROM installed optionally in the printer.

Command	Function	Page
EPRM	read/list EPRoM data	2-105
ICCD	read/write IC-CarD	2-137
RWER D	[Read/Write External Resource] Delete data on external media	2-248
RWER F	[Read/Write External Resource] Format external media	2-250
RWER I	[Read/Write External Resource] automatically print partition Information	2-251
RWER L	[Read/Write External Resource] print partition List	2-252
RWER R	[Read/Write External Resource] Read data from external media	2-253
RWER S	[Read/Write External Resource] Store TrueType font	2-255
RWER T	[Read/Write External Resource] set Terminate string	2-257
RWER W	[Read/Write External Resource] Write data to external media	2-258
WRED	WRite EnD	2-360

15. Access Commands for FS-series Options

A variety of options, such as feeders and sorters, are available for Kyocera page printers. The commands below support features of the optional equipment.

Note: **The optional equipment includes support documentation for these features.**

Command	Function	Page
ASTK	Assign STacKer trays	2-33
CDSK	Check DiSK	2-48
CSTK	select Collator STacKer	2-66

Command	Function	Page
DUPX	select/deselect DUPleX mode	2-88
DXPG	Select DupleX PaGe side	2-90
JOBD	JOB Deletion	2-144
JOBL	print JOB List	2-145
JOBO	JOB Output	2-146
JOBP	JOB output Parameter setting	2-147
JOBS	JOB Start	2-148
JOBT	JOB Terminate	2-149
JOG	JOG output stack for separation	2-150
MID	Multi-tray ID	2-168
MSTK	select Mail-box STacKer	2-176
SSTK	select Sorter STacKer	2-335
STPC	set STaPle Counter	2-344
STPL	STaPLe option	2-345

16. MPS commands

When the optional sorter is mounted on the printer, these commands are used for electronic sorting, job allocation, stapling, etc. For details on MPS commands, refer to Chapter 7.

17. Special command set for color printers (PRESCRIBE 2c)

The PRESCRIBE 2c command set, which is a version of PRESCRIBE 2e that has been expanded for color printers, supports color printers. For details on the special command set for color printers, refer to Chapter 8.

18. Virtual mailbox commands

It is possible to electronically allocate printing data without connecting any optional equipment, such as a sorter, to the printer. For details on virtual mailbox commands, refer to Chapter 9.

ALTB A — [ALlocate TaBle] Assign code translation table

Format

```
ALTB A, #1;
```

Parameter

#1:
table ID number to be allocated as a code translation table

Function

The ALTB A command allocates user-defined table as a code translation table for the current resident font.

A command error results and the command has no effect if parameters other than the above are used or if the table ID does not exist.

ALTB C — [ALlocate TaBle] Convert character code

Format

`ALTB C, #1, #2, #3;`

Parameters

#1:

table ID number to define code conversion: 1 to 65535

#2:

character code before conversion: 1-byte code = 0 to 255; 2-byte code = 0 to 65533, or in hexadecimal notation ($xxxx).

#3:

character code after conversion: 1-byte code = 0 to 255; 2-byte code = 0 to 65533, or in hexadecimal notation ($xxxx).

Function

The ALTB C command registers character codes given by #2 and #3 in the user-defined table already created.

If the same alternate table ID number already exists, the latter ID number has precedence.

A command error results and the command has no effect if parameters other than the above are used.

ALTB D — [ALlocate TaBle] Delete code conversion table

Format

`ALTB D, #1;`

Parameter

#1:
table ID number to be deleted

Function

The ALTB D command deletes the table already defined as a code translation table. When the table to be deleted is allocated as a code translation table, terminate the allocation before deleting by using ALTB R (page 2-19).

It is possible to delete all code translation tables at once which have already been allocated by using `ALTB D, 0;`.

A command error results and the command has no effect if parameters other than the above are used or if the table ID does not exist.

ALTB E — [ALlocate TaBle] End defining combination characters

Format

```
ALTB E;
```

Parameter

None

Function

This command signals the end of defining combination characters in an already declared user-definition table which was started by the ALTB S command (page 2-20). The registered combined characters can be printed by specifying the character code which was assigned at the time of definition.

ALTB G — [ALlocate TaBle] Generate user-defined table

Format

```
ALTB G, #1, #2;
```

Parameters

#1:

table ID number: 1 to 65535

#2:

1 = 1-byte format table (character codes 0 to 255)
2 = 2-byte format table (character codes 0 to 65533)

Function

The ALTB G command creates and registers a user-defined table.

If the same table ID number already exists, the latter ID number has precedence.

A command error results and the command has no effect if parameters other than the above are used.

ALTB R — [ALlocate TaBle] Release code translation table

Format

`ALTB R, #1;`

Parameter

#1:
table ID number of the code translation table to be terminated

Function

The ALTB R command terminates the allocation of the alternate table allocated as a code translation table for the current resident font. It is also possible to terminate the allocation of all code translation tables which have been allocated by using `ALTB R, 0;`.

A command error results and the command has no effect if parameters other than the above are used or if the table ID does not exist.

ALTB S — [ALlocate TaBle] Start to define combination character

Format

```
ALTB S, #1, #2[, #3, #4[, #5, #6, [#7]]];
```

Parameters

#1:

table ID number to define the combination character: 1 to 65535

#2:

character code to define the combination character:
1-byte code = 0 to 255; 2-byte code = 0 to 65533, or in hexadecimal notation ($xxxx).

#3:

width of the character, in units where the width of the resident font character is 1000 units: 1 to 65535.

#4:

height of the character, in units where the height of the resident font character is 1000 units: 1 to 65535.

#5:

X coordinate of the reference point, integer value converted in reference to 1000 units.

#6:

Y coordinate of the reference point, integer value converted in reference to 1000 units.

#7:

paint mode: 0 = normal (fill), non-zero = line width of outline character (stroke): 1 to 100 units.

Function

This command starts to define the generated characters specified by parameters #2 and following into the user-defined table already declared. Since character data is registered using the ALTB T command (page 2-22), this command is used only to start the definition. Use ALTB E to terminate the definition.

If the same alternate table ID number already exists, the latter ID number has precedence.

A command error results and the command has no effect if parameters other than the above are used.

ALTB T — [ALlocate TaBle] define combined character data by Table

Format

ALTB T, *#1*, *#2*, *#3*, *#4*, *#5*;

Parameters

#1:

character code for the combined character, or hexadecimal notation ($xxxx). (JIS code)

#2:

character width (the value from 1 to the character width specified by ALTB S) (page 2-20).

#3:

character height (the value from 1 to the character height specified by ALTB S) (page 2-20).

#4:

X coordinate of character reference point (integer value calculated in 1000 unit basis)

#5:

Y coordinate of character reference point (integer value calculated in 1000 unit basis)

Function

This command defines the region and origin coordinates for each characters to be combined for characters given by the ALTB S command. This command specifies the region in which to store characters within coordinates (0, 0) to (1000, 1000) by specifying a rectangular area and reference point for the characters. There are no particular restrictions on the number of characters which can be registered as any number up to ALTB E (page 2-17) is encountered.

Example:

A command error results and the command has no effect if parameters other than the above are used.

ALTF — change to ALTernate Font

Format

ALTF *alternate-number*;

Parameter

alternate-number: a number from 0 to 47

Function

The ALTF command changes the current font to a font designated by an alternate number. The actual font assigned to this alternate number is set by a previous SETF command.

The alternate number can be a bitmap font number or a number specifically assigned to the scalable font using the SFNT command (See *File* on the next page).

If no font has been assigned to the specified alternate number, the ALTF command has no effect: the font does not change.

The ALTF command enables you to prepare a document using several fonts, without deciding in advance which specific fonts to use. For example, you could use ALTF 1 to designate plain text and ALTF 2 to designate italics, and allow the specific size and style of type to be determined by SETF commands at a later time.

File

```
!R! RES;
SFNT ″Swiss742SWC-RomanCondensed″, 12, 1000;
SFNT ″Dutch801SWC-Italic″, 11, 1001;
SETF 1, 1000;
SETF 2, 1001;
MCRO BIBLIO;
  ALTF 1; TEXT %1, E; TEXT ″ ″, E;
  ALTF 2; TEXT %2, E; TEXT ″ ″, E;
  ALTF 1; TEXT %3, N;
ENDM;
ALTF 1; TEXT ″Bibliography″, N, U;
TEXT, N;
CALL BIBLIO,
  ″Radin, Paul,″,
  ″Hero Cycles of the Winnebago,″,
  ″Indiana University Publications″;
CALL BIBLIO,
  ″Neumann, Erich,″,
  ″Amor and Psyche,″, ″Bollingen Press″;
CALL BIBLIO,
  ″Jung, Carl G.,″, ″Man and His Symbols,″,
  ″Bollingen Press″;
PAGE;
EXIT;
```

Printout

Bibliography

Radin, Paul, *Hero Cycles of the Winnebago,* Indiana University Publications
Neumann, Erich, *Amor and Psyche,* Bollingen Press
Jung, Carl G., *Man and His Symbols,* Bollingen Press

AMCR — call Automatic MaCRo

Format

AMCR *mode, [repeat-count] macro-name, parameter-value, ...;*

Parameters

mode:

E=Enable automatic macro; save and retain current printing parameters
T=Enable automatic macro; do not save current printing parameters
D=Disable automatic macro

repeat-count:

number of times the macro is to be executed

macro-name:

name defined by a MCRO command

parameter-value:

values given to the dummy parameters in the macro definition

Function

The AMCR command enables the automatic macro (overlay). It automatically executes the macro defined by a MCRO command each time a page is printed. For example, it would be used to print multiple copies of the same form, filled in with different text.

The AMCR command closely resembles the CALL command; therefore, the user should refer to the section on the CALL command for further information.

When the automatic macro is enabled using mode E, the following printer settings are saved and retained upon completion of the macro: font information, margins, cursor position, line spacing, character spacing, page orientation, unit of measurement, underline parameters, and fill pattern.

When the automatic macro is enabled with mode T, the printer settings are modified according to the parameter settings contained in the macro.

The automatic macro remains enabled until the AMCR command with the mode set to D is encountered or the printer is switched off.

The following commands are invalid within a macro:
ASTK, CASS, CCPY, DUPX, DXPG, JOBD, JOBL, JOBO, JOBP, JOBS, JOBT, JOG, LDFC, LDFN, MID, MSTK, RDMP, SEM, SPSZ, SSTK, STAK, STAT, STPL, VMAL, VMPW

File

```
!R! RES;
MCRO CROPMARK;
UNIT C;
MZP 2.46, 3.96; SCP; SCP; SCP;
MRP -.635, 0; DRP -1.9, 0; RPP;
MRP 0, -.635; DRP 0, -1.9; RPP;
MRP 14.85, 0; SCP; SCP;
MRP .635, 0; DRP 1.9, 0; RPP;
MRP 0, -.635; DRP 0, -1.9; RPP;
MRP 0, 21; SCP; SCP;
MRP .635, 0; DRP 1.9, 0; RPP;
MRP 0, .635; DRP 0, 1.9; RPP;
MRP -14.85, 0; SCP;
MRP -.635, 0; DRP -1.9, 0; RPP;
MRP 0, .635; DRP 0, 1.9;
RPP;
ENDM;

AMCR E, CROPMARK;
PAGE; UNIT C; SLM 3.6; STM 5.2; EXIT;
The text starts here.
```

Printout

ARC — draw filled-in ARC

Format

ARC *inner-radius, outer-radius, start-angle, end-angle;*

Parameters

inner-radius:
inner radius of arc

outer-radius:
outer radius of arc

start-angle:
starting angle

end-angle:
ending angle

Function

The ARC command works in the standard graphics mode. It draws a filled-in arc-shaped area extending from the inner radius to the outer radius, and from the starting angle to the ending angle. The area is filled with the pattern designated by the previous PAT, FPAT, or GPAT command. The starting and ending angles are specified in integer degrees measured clockwise from the vertical. (Note that the PARC command measures the angles from the positive *x* axis.) The cursor is located at the center of curvature of the arc, and does not move.

If the inner radius is zero, the area has a pie-slice shape, and can be used to fill in one sector of a pie chart.

If the inner and outer radii are nearly equal and the fill pattern is the all-black pattern (PAT 1, for example), the result is a line arc. The line thickness is the difference between the two radii, rather than the value designated by the SPD (set pen diameter) command.

The ARC command does not draw the boundary of the filled-in area.

Related Command

PARC

File

```
!R! RES; UNIT C;
MAP 5, 7;
PAT 52;
ARC 1, 2, -45, 45;
MAP 5, 9;
PIE 2, 0, 10, 20, 30;
ARC 0, 2, 0, 60;
PAT 20;
ARC 0, 2, 60, 180;
PAT 10;
ARC 0, 2, 180, 360;
PAT 1;
NEWP;
PMZP 4, 2;
PARC 4, 3, 1, 90, 270;
PARC 5, 4, 1, 180, 360;
PARC 6, 3, 1, 270, 90;
PARC 5, 2, 1, 0, 180;
STRK;
MRP 0.75, 1.2;
MRP 0.75, 1.2;
SFNT ”Swiss742SWC-Roman”;
TEXT ”ARC”;
PAGE; EXIT;
```

Printout

ASFN — ASsign FoNt

Format

ASFN *mode*, *font-number*;

Parameters

mode:
A = assign an external font
R = unassign an external font

font-number:
number identifying the external font: 1000 to 65535

Function

If A is specified for *mode*, the user-defined font (*font number*) is assigned as an external font for the resident font (currently selected). Note that the user-defined font must already be downloaded for the printer. If R is specified, the user-defined font assigned for the resident font as an external font is unassigned. It is also possible to unassign all external fonts by using `ASFN R, 0;`.

To delete user-defined fonts registered as external fonts by using the DAF or DELF command, it is necessary to cancel the external font assignment before deletion using mode R of the ASFN command.

If the user-defined font is a 1-byte code font, it is assigned to the current ANK font. If it is a 2-byte code font, it is assigned to the current kanji font.

This command is disabled if the resident font is a bitmap font and the font to be assigned is an outline font.

A command error results and the command has no effect if parameters other than the above are used or if the user-defined font specified by font number does not exist.

ASTK — Assign STacKer trays

Format

ASTK *n1, n2, n3, ...;*

Parameters

n1, n2, n3, ...:

Numbers represent the tray in the optional sorter which becomes the last (bottom) tray in each group, as counted from the top towards the bottom tray.

Function

The ASTK command assigns the sorter trays for grouping in the multiple environment mode of the sorter. By grouping the specific trays, the use of the sorter can be shared among the multiple users.

Each parameter represents the last tray in each tray group to be newly grouped. The maximun number of parameters must be equal to the number of the sorter trays. If all parameters are omitted for ASTK, the tray groups are reset to the factory default (See the table below).

Group ID	Trays	
	SO-6	SO-30
Group 1	1, 2	1, 2
Group 2	3, 4	3, 4
Group 3	5, 6	5, 6
Group 4	7, 8	7, 8
Group 5	9 to 15	9

The MID (Multi-tray ID) command is used to select the one of the tray groups. See the MID command page.

In the interface-specific multiple mode of the sorter, groups greater than 3 are ignored. (Group 3 is also ignored if the option interface is not installed.) The ASTK command is ignored if the value is greater than the actual number of trays.

If the parameters for an ASTK command are less than the maximum number of sorter trays, the printer automatically groups the remaining trays, making it the last tray group. For example, the command sequence ASTK 2, 4, 6; is equivalent to ASTK 2, 4, 6, (bottom tray number);.

The tray group setting made by ASTK is stored indefinitely in the printer's permanent memory while the power is off, or until it is changed by another ASTK command. It is ignored in the normal sorter mode (FRPO S0, 0;) but the printer automatically sets up the previous tray group setting when the sorter is again switched to the multiple environment mode (FRPO S0, 1; or FRPO S0, 2;).

Related Commands

CSTK, MID, MSTK, SSTK

File

```
!R! FRPO S0, 1; CMNT Enter multiple sorter mode;
    ASTK 3, 7, 9; CMNT Create three groups;
    MID 2; CMNT Send the output to 2nd grp.;
    SSTK; CMNT Sort;
EXIT;
```

When the above command sequence is executed, print jobs will be delivered to trays 4, 5, 6, and 7 (the second group).

BARC — draw BARCode

Format

BARC *type*, *flag*, '*string*'[, *short*, *tall*[, *bar1*, *bar2*, *bar3*, *bar4*, *space1*, *space2*, *space3*, *space4*]];

Parameters

type:

Barcode type of the following:
0=UPC A
1=UPC A with two-digit supplement
2=UPC A with five-digit supplement
3=UPC D-1
4=UPC D-2
5=UPC D-3
6=UPC D-4
7=UPC D-5
8=UPC E
9=UPC E with two-digit supplement
10=UPC E with five-digit supplement
11=EAN-8
12=EAN-13
13=DUN-14 (Distribution Unit Number, EAN)
14=DUN-16 (Distribution Unit Number, EAN)
15=MSI with no check digit
16=MSI with single mod-10 check digit
17=MSI mod-10 followed by mod-10 check digit
18=MSI mod-11 followed by mod-10 check digit
19=Code 39 with no check digit (USD-3)
20=Code 39 with mod-43 check digit (USD-3)
21=Interleaved two of five (USD-1) with no check digit (See type 41.)
22=Identicon two of five with no checksum
23=Code 128 (USD-6) manual code change
24=Code 128 (USD-6) automatic code change
25=Code 11 with only 'c' checksum (USD-8)
26=Code 11 with both 'c' and 'k' checksums (USD-8)
27=Code 93 with both 'c' and 'k' checksums (USD-7)
28=CODABAR with no check digits (USD-4)
29=Matrix two of five with no checksum
30=Datalogic two of five with no checksum

31=Industrial two of five with no checksum
32=Ames with no checksum
33=Delta distance 'a' (IBM) with no checksum
34=Delta distance 'a' (IBM) with checksum
35=EAN 8 with two-digit supplement
36=EAN 8 with five-digit supplement
37=EAN 13 with two-digit supplement
38=EAN 13 with five-digit supplement
39=POSTNET (USPS)
40=FIM (USPS)
41=Interleaved two of five (USD-1) with checksum
42=UCC/EAN 128
43=Customer (FS-600/FS-7000 only)
44=Wide gap CODABAR (FS-600/FS-7000 only)

flag:

Y=Print human-readable text
N=Do not print human-readable text

string:

Text string to be printed as barcode

short:

Height of short bars in barcode types that have two heights of bars. Height of all bars in other cases. Values may be 0.1 inches (0.254 centimeters, 30 dots) to 11 inches (27.9 centimeters, 3300 dots).

tall:

Height of tall bars in barcode types that have two bar heights. Values may be the same as above.

bar1/2/3/4:

Width of different classes of bars specified in ascending order. Values may be 1 dot (0.0034 inches, 0.0085 centimeters) to 200 dots (0.6667 inches, 1.6933 centimeters).

space1/2/3/4:

Widths of different classes of spaces specified in ascending order. Values may be the same as bar *1/2/3/4* above.

Barcodes are more fully detailed with samples in *Chapter 4*.

BLK — draw filled-in BLocK

Format

BLK *width, depth[, option];*

Parameters

width:
width of the block

depth:
depth of the block

option:
B=Leave the cursor unmoved (Default)
H=Move the cursor to the horizontally adjacent corner
V=Move the cursor to the vertically adjacent corner
E=Move the cursor to the diagonally opposite corner
L=Move the cursor one line down
N=Move the cursor to the beginning of the next line

Function

The BLK command draws a block of a specified size with one corner at the current cursor position. The block is filled in with the pattern designated by the previous PAT, FPAT, or GPAT command. The cursor is moved as specified by the option. If the option is omitted, the cursor is not moved (same as option *B*).

File

```
!R! RES; UNIT C;
    MAP 5, 5;
    PAT 20;
BOX 4, 1; BLK 4, 1;
MRP 0, 1.5;
BOX 4, 1; BLK 4, 1;
MRP .9, .6;
SFNT ”Swiss742SWC-RomanCondensed”;
TEXT ’OVERPRINTING’;
MRP 0, 5;
PAT 29; BOX 1, -4; BLK 1, -4, H;
PAT 39; BOX 1, -3; BLK 1, -3, H;
PAT 49; BOX 1, -2; BLK 1, -2, H;
PAT 59; BOX 1, -1; BLK 1, -1, H;
PAGE;
EXIT;
```

Printout

BOX — draw BOX

Format

BOX *width, depth[, option];*

Parameters

width:
width of the box

depth:
depth of the box

option:
B=Leave the cursor unmoved (Default)
H=Move the cursor to the horizontally adjacent corner
V=Move the cursor to the vertically adjacent corner
E=Move the cursor to the diagonally opposite corner
L=Move the cursor one line down
N=Move the cursor to the beginning of the next line

Function

The BOX command draws a box of a specified size with one corner at the current cursor position. The line thickness is designated by the SPD (set pen diameter) command. The size and thickness is measured on the basis of value established in the UNIT command. The cursor is moved as specified by the option. If the option is omitted, the cursor is not moved (same as option B).

The BOX command draws only the outline of the box. To fill in the box, use the BLK command.

The width and depth may use either a positive or negative value.

File

```
!R! RES; UNIT C; SPD .1;
    SLM 2;
    MAP 4, 0;
    SCP;
    SFNT ”Swiss742SWC-RomanCondensed”, 10;
    BOX 4, 2, L; TEXT ’Text printed with option
    L’;
    RPP;
    BOX 4, 2, N; TEXT ’Text printed with option
    N’;
    PAGE;
EXIT;
```

Printout

CALL — CALL macro

Format

CALL *[repeat-count] macro-name, parameter-value, ...;*

Parameters

repeat-count:
number of times the macro is to be executed

macro-name:
name defined by a MCRO command

parameter-values:
values given to the dummy parameters in the macro definition

Function

The CALL command executes a macro previously defined by a MCRO command. The macro may be executed any desired number of times by specifying a repeat count. Note that the repeat count is not followed by a comma. If the repeat count is omitted, the macro is executed once.

Only the first four characters of the macro name are significant. They must match the first four characters of a macro name defined by a previous MCRO command.

A parameter value consists of the characters that occur between the delimiting commas, excluding the commas. These parameters are substituted without change for the corresponding dummy parameter in the macro definition, except that consecutive spaces are compressed to a single space.

When a character-string parameter is enclosed in apostrophes or quotation marks, the enclosed string together with the enclosing apostrophes or quotation marks is substituted for the dummy parameter. In this case, consecutive spaces are not compressed.

If a CALL command has too few parameters, it is still valid. The macro is partially executed; any commands in the macro body without appropriate parameters will be ignored.

The CALL command, like other Prescribe commands, is limited to 255 characters in length.

File

```
!R! RES; UNIT C; SLS .5;
CMNT Requires BX and SCREEN macros;
CMNT See ENDM command page;
MAP 9, 3; CALL BX;
MAP 7, 4; CALL 5 BX;
MAP 5, 5; CALL 9 BX;
MAP 8, 6; CALL SCREEN, 2.2, 1.7;
MAP 8.6, 7;
TEXT 'Narrow', L;
TEXT 'screen';
MAP 5,9; CALL SCREEN, 8.2,1.2;
MAP 8,10;
TEXT 'Wide screen';
PAGE;
EXIT;
```

Printout

CASS — select CASSette or manual feed

Format

CASS *mode;*

Parameter

mode:

0=manual feed
1=cassette 1 (printer's cassette)
2=cassette 2 (upper cassette of optional paper feeder)
3=cassette 3 (lower cassette of optional paper feeder)
4=envelope/universal feeder (optional)

Function

The CASS command selects whether to feed paper from the cassette, manual feed tray, cassettes of the paper feeder, or the envelope/universal feeder. If your printer has not the option feeder(s) installed, the printer's cassette is considered to be cassette 1 (parameter value 1) and parameter values 2, 3, and 4 are ignored. The default value is 1.

The selected value remains in effect until changed by another CASS command, reset to the default value of 1 by a RES command or by turning printer power off.

Note: **The CASS command causes a page break, so it should be placed at the beginning of a file or program, or at the top of a new page.**

File

```
!R! CASS 0; SPSZ 2; CMNT Envelope; SPO L;
EXIT;
Mr. Harold Anderson
Dotstream Corp.
217 First Avenue
Cambridge, MA 02999
!R! PAGE; CASS 1; SPSZ 0; SPO P; STM 2; SLM 1;
EXIT;
Dear Harry,

The catalog for our new printer has just come out
and I am enclosing a copy for reference. You will
soon understand that this new printer is a
remarkable product.

Yours sincerely,
!R! PAGE; EXIT;
```

Printout

Omitted

CCPY D — Carbon CoPY, Disable

Format

```
CCPY D;
```

Function

The CCPY D command ends execution of a carbon copy.

CCPY E — Carbon CoPY, Enable

Format

```
CCPY E;
[#1] [#2] #3
[#1] [#2] #3
.
.
.
ENDC;
```

Parameters

#1:
cassette command

#2:
auto macro command

#3:
terminate command

Function

The CCPY command is for making carbon copies. Executing this command will cause the number of copies given by COPY to be ignored. The number of lines between CCPY and ENDC will be used as the number of copies.

A paper cassette specification using the CASS or PSRC command and an auto macro specification using the AMCR command can be given for each page of the copy.

Specifications for each page are terminated using the terminate command TERM.

Executing this command disables AMCR and EMCR.

The paper size and the direction of paper feed (portrait or landscape) must be identical for the paper cassettes from which paper is fed using the CCPY command. The CCPY command is ignored if these do not match.

The following commands are invalid within a macro:
AMCR, ASTK, CASS, CCPY, DUPX, DXPG, ENDC, JOBD, JOBL, JOBO, JOBP, JOBS, JOBT, JOG, LDFC, LDFN, MID, MSTK, RDMP, SEM, SPSZ, SSTK, STAK, STAT, STPL, TERM, VMAL, VMPW

CDSK — Check DiSK

This is an MPS command.

Function

This command verifies data in the hard disk (garbage collection).

For a detailed explanation of this command, refer to Chapter 7, "Prescribe Commands for MPS Management."

CIR — draw CIRcle

Format

`CIR` *radius;*

Parameter

radius:
radius of the circle

Function

In standard graphics mode, the CIR command draws a circle centered at the current cursor position. The line thickness used is designated by the SPD command.

A circle can also be drawn by using the path mode graphics. Refer to the PARC command.

File

```
!R! RES; UNIT C; SLS .5;
SPD .01; MAP 10, 1;
CIR .1; MRP 0, .1;
CIR .2; MRP 0, .2;
CIR .4; MRP 0, .4;
CIR .8; MRP 0, .8;
SPD .02;
CIR 1.6; MRP 0, 1.6;
CIR 3.2; MRP 0, 3.2;
SPD .2;
CIR .1; MRP .2, .4;
SFNT ”Swiss742SWC-RomanCondensed”; TEXT ’Cursor now
here’;
PAGE;
EXIT;
```

Printout

CLIP — CLIP current path

Format

```
CLIP [#1];
```

Parameter

#1:

clip mode
1: EO clip
2: Non-zero wind clip

Function

The CLIP command sets the current path as the clip path. After this command is issued, no painting is done outside the area of the clip path. Executing this command does not delete the current path.

The CLIP command is ignored if used with DAP, DRP, DRPA, DZP, BOX, BLK, CIR, ARC, or PIE.

The RES command initializes to a state with no clip area.

If the clip mode is specified as other than above, an error results and the command has no effect.

CLPR — CLiP Rectangular area

Format

CLPR [*x1, y1, x2, y2*];

Parameters

x1:
x coordinate of the top-left corner of the rectangle

y1:
y coordinate of the top-left corner of the rectangle

x2:
x coordinate of the bottom-right corner of the rectangle

y2:
y coordinate of the bottom-right corner of the rectangle

Function

The CLPR command describes a rectangular path which intersects the inside of the texts, current path, or raster graphics objects. The clipping rectangle does not clip those graphics segments drawn in the standard mode graphics. Any painting operations outside the specified rectangle is erased and those segments within it are painted on the page.

The coordinates are measured from the top and left edge limits in the units designated by the UNIT command. If the parameters are omitted, the rectangle is equal to the size of the current page size. If an attempt is made to position the *top-left* corner to the right of the *bottom-left* corner [greater values for (*x1*, *y1*) than for (*x2*, *y2*)], the printer exchanges the coordinate values with each other.

The printer resets the size of the rectangular clipping path to be equal to the maximum printable area of the current page size when a CASS, RES, SPO, or SPSZ (Set Page SiZe) command is encountered.

File

```
!R! RES; UNIT C;
NEWP;
SPD 1;
PMRA 6, 9, 3, 0;
PAT 1;
PARC 6, 9, 3, 0, 360;
CLPR 3, 6, 9, 12;
STRK;
PAGE;
EXIT;
```

Printout

CLSP — CLoSe Path

Format

```
CLSP;
```

Parameter

None

Function

The CLSP command closes an open path by adding a line segment extending from the end of the path to the beginning of the path.

Simply ending a path at the path's starting point does not make it a closed path; such a path remains open until it is closed.

Closure can be made either explicitly, by means of the CLSP command, or implicitly by means of the FILL (FILL current path) command.

Related Command

NEWP

File

```
!R! RES; UNIT C;

NEWP;
CMNT The 1 st path below is stroked without closing;
SPD .25;
PMZP 5, 10;
PMRA 5, 10, 1, 90;
PARC 5, 10, 1, 90, 270;
PARC 7, 10, 1, 270, 90;
STRK;

NEWP;
CMNT Next path is closed by CLSP before stroked;
PMZP 5, 14;
PMRA 5, 14, 1, 90;
PARC 5, 14, 1, 90, 270;
PARC 7, 14, 1, 270, 90;
CLSP;
STRK;

PAGE; EXIT;
```

Printout

CMNT — CoMmeNT

Format

`CMNT` *`string;`*

Parameter

string:
any character string

Function

The CMNT command is a character string, typically a comment explaining the purpose of the following Prescribe commands. The comment command will be ignored by the printer.

Although character strings are normally enclosed in apostrophes or quotation marks, this is unnecessary for comment strings as long as the string does not itself contain an **apostrophe, quotation mark, or semicolon.**

File

```
!R! RES;
SLM 2; STM 2;
FONT 2; CMNT Dutch801BM10-Roman;
EXIT;
The CMNT command in the above program reminds
you that FONT 2 represents the Dutch801BM10-Roman font.
```

Printout

The CMNT command in the above program reminds
you that FONT 2 represents the Dutch801BM10-Roman font.

COPY — set number of COPIES

Format

COPY *number;*

Parameter

number:
number of copies

Function

The COPY command designates the number of copies for each page in a print job. This copy count value can be changed by sending the printer another COPY command or by issuing a reset command. For best results, place the copy command near the start of a job or at the top of a page. If two or more copy commands are placed on the same page, the last one will be recognized.

File

```
!R! RES;
SLM 0.5;
UNIT P;
SFNT 'Swiss742SWC-Bold', 14.4;
SLS 17;
COPY 3;
EXIT;
    Announcement
    Party Tonight at 6:00
!R! PAGE; EXIT;
```

Printout

CPTH — Character PaTH

Format

CPTH *'string'*;

Parameters

string:
any character string except from ASCII code 31 (hex 1F) and lower

Function

The CPTH command constructs a path which adds the outlines of characters to the current path. When stroked or filled, it prints the given *string* at the current cursor position and moves the cursor to the end of the string.

The CPTH command enables the user to create special graphical effects on characters by treating the outline of characters as a path. The current font preceding this command must be a resident or a soft scalable font.

Note: **The CPTH command is not executed if the current font is a bitmap font.**

The character path can be filled in with the pattern or shade of gray designated by the previous PAT, FPAT, or GPAT command.

File

```
!R! FSET 1p72v1s0b4148T; CMNT Swiss742SWC-Italic;
NEWP;
PMZP 1, 1;
CPTH ’Enjoy’;
STRK;
PAGE;
EXIT;
```

Printout

CSET — Change symbol SET by symbol-set ID

Format

`CSET` *symbol-set-ID*;

Parameter

symbol-set-ID

0D=ISO 60 Norway
0E=Roman Extension
0F=ISO 25 French
0G=HP German
0I=ISO 15 Italian
0K=ISO 14 JIS ASCII
0N=ECMA-94 Latin 1
0S=ISO 11 Swedish
0U=ISO 6 ASCII
1D=ISO 61 Norwegian
1E=ISO 4 U.K.
1F=ISO 69 France
1G=ISO 21 Germany
1S=ISO 15 Spanish
1U=US Legal
2K=ISO 57 Chinese
2N=ISO Latin 2
2S=ISO 17 Spain
2U=ISO 2 IRV
3R=PC Cyrillic*
3S=ISO 10 Swedish
4S=ISO 16 Portuguese
5M=PS Math
5N=ISO Latin 5
5S=ISO 84 Portuguese
5T=ISO Windows Latin 5
6J=MS Publishing
6M=Ventura Math
6N=ISO8859/10 Latin 6
6S=ISO 85 Spanish
7J=Desktop

8G=Greek-8
8M=Math 8
8Q=PC Set 1 IBM
8T=Turkish-8
8U=HP Roman-8
9E=Windows Latin 2
9G=Windows 3.1 Latin/Greek
9J=PC-1004
9L=Ventura ITC Zapf Dingbats
9N=ISO Latin 9
9Q=PC Extension
9R=Windows 3.1 Latin/Cyrillic
9T=PC-Turkish
9U=Windows 3.0
10G=PC-851 Latin/Greek
10J=PS Text
10L=PS ITC Zapf Dingbats
10N=ISO8859/5 Latin/Cyrillic
10R=PC-855 Cyrillic/Serbia
10U=IBM PC-8
11G=PC-869 Latin/Greek
11L=ITC Zapf Dingbats 100
11U=IBM PC-8 Danish/Norwegian
12G=PC-8 Latin/Greek
12J=Macintosh
12L=ITC Zapf Dingbats 200
12N=ISO8859/7 Latin/Greek
12R=USSR-GOST
12U=IBM PC-850
13J=Ventura International
13L=ITC Zapf Dingbats 300
13P=AB/COMP Brazil/Portugal
13R=PC-8 Bulgarian
14G=Greek Alternate 437G
14J=Ventura US
14L=PS ITC Zapf Dingbats*
14P=AB/COMP International
14R=PC Ukrainian
15U=Pi Font
16U=PC-857
17U=PC 852
18U=PC-853 Turkish/Latin 3
19L=Windows 3.1 Baltic*
19M=Symbol (Symbol-Set-SWM font only)

19U=Windows Latin 1
20U=PC-860 Portugal*
21U=PC-861 Iceland*
23U=PC-863 Canada-French*
24Q=PC-8 Pollish Mazovia*
25U=PC-865 Norway*
26U=PC-775 Baltic*
27Q=PC-8 PC Nova*
579L=Windings (More Wingbats-RegularSWM font only)

Note: **The symbol set IDs that can be selected depend on the printer and on the font that is selected.**

* Available only on models with Agfa fonts. For details on the fonts that are resident in a printer, refer to the User's Manual.

Function

Symbol set refers to a specific group of alphabetic, numeric, and symbol characters. The CSET command specifies the symbol set to suit the various application demands and languages with the current font. The factory default symbol set is 0U (US ASCII). The symbol-set-ID uses identical parameters to the Hewlett-Packard control codes.

When the FSET command is used to select a font, the printer selects a font based on a prioritization of the font characteristics. Among the given characteristics, the symbol set has the highest priority in the font selection process. Refer to FSET command page.

If the specified symbol set does not exist, the symbol set remains unchanged.

Files

```
!R! RES;
SFNT 'Swiss742SWC-Roman', 24;
SLPI 3;
CMNT Current symbol set is ISO 6: ASCII;
TEXT '@ABCDEFG', N;
        CSET 6M; CMNT Changed to Ventura Math;
TEXT '@ABCDEFG';
PAGE;
EXIT;
```

Printout

@ABCDEFG
≅ΑΒΧΔΕΦΓ

CSTK — select Collator STacKer

Format

`CSTK` *[tray, tray, ...]*`;` or `CSTK 0;`

Parameters

tray:
number from 1 to the maximum (bottom)

Function

The CSTK command is effective only when the optional sorter is installed to the printer. It instructs the printer to deliver printed pages to the option sorter in the collator mode. Each specified tray receives all copies of one page. The copies of the first page go to the first specified tray, the copies of the second page to the second specified tray, and so on.

If the tray parameter is omitted, trays are used in order from top to bottom.

The copy count must be selected with the COPY command. The maximum copy count in the collator mode is 50 (SO-6)/200 (SO-30) [the capacity of the sorter trays].

Upon receiving the CSTK command, the printer automatically performs a page feed.

The tray parameter of 0 (CSTK 0;) should be used only to deselect the collator mode for receiving pages in the sorter's bulk tray (stacker mode) [SO-6].

File

```
!R! RES; CSTK 1, 2; COPY 2;
EXIT;
Page 1 (2 copies, tray 1) !R! PAGE; EXIT;
Page 2 (2 copies, tray 2) !R! PAGE; EXIT;
Page 3 (2 copies, tray 1) !R! PAGE; EXIT;
Page 4 (2 copies, tray 2) !R! PAGE; EXIT;
```

Printout

Omitted

CTXT — print Centered TeXT

Format

```
CTXT ['string'][,option][,U-option];
```

Parameters

string:
any character string

option:
B=Leave cursor at center of string
E=Move cursor at end of string
L=Move cursor down one line
N=Move cursor to beginning of next line

U-option:
Underline text

Function

The CTXT command prints the given string centered at the cursor location, then moves the cursor as designated by the option. The string must be enclosed in either single or double quotation marks. (If the string includes one kind of quotation marks, use the other kind to enclose it.) If the string is omitted, nothing is printed. If the option is omitted, the cursor is not moved. If the U-option is specified, the text is underlined. The underline thickness and location can be set by the SULP command.

The string is not centered between the right and left margins unless the cursor is located halfway between the margins. Before the CTXT command, the cursor should be moved to the desired center position by a command such as MAP, MRP, or PMRP.

The length of the string is unlimited, except that the command as a whole may not be longer than 255 characters. Carriage-return and linefeed codes in the string are ignored.

File

```
!R! RES; SLPI 3; SFNT ”Swiss742SWC-Bold”, 16;
    MAP 4, 1;
    CTXT ’NEWS!’, L, U;
    SFNT ”Dutch801SWC-Italic”, 16;
    CTXT ’Unforgettable Holidays in Sydney’, L;
    CTXT ’For 6 Days Only at $1000!’;
    PAGE;
EXIT;
```

Printout

NEWS!

Unforgettable Holidays in Sydney

For 6 Days Only at $1000!

DAF — Delete All Fonts

Format

```
DAF;
```

Parameter

None

Function

The DAF command deletes all nonresident fonts and the font numbers assigned to scalable fonts by the SFNT command from the printer's memory. This enables the user to make room for new fonts, macros, and graphics.

File

```
!R! UNIT P; SLS 16;
SFNT 'Swiss742SWC-Bold',  15, 2000, 277, 2, 0;
SFNT 'Swiss742SWC-Roman', 15, 2001, 277, 1, .5;

FONT 10;   TEXT '1. FAREWELL TO ', E;
FONT 2000; TEXT 'FONT 2000', N;
FONT 2001; TEXT 'AND FONT 2001', N;
TEXT, N;

DAF;
FONT 10;   TEXT '2. FAREWELL TO ', E;
FONT 2000; TEXT 'FONT 2000', N;
FONT 2001; TEXT 'AND FONT 2001';

PAGE;
EXIT;
```

Printout

1. FAREWELL TO FONT 2000
AND FONT 2001

2. FAREWELL TO FONT 2000
AND FONT 2001

DAM — Delete All Macros

Format

```
DAM;
```

Parameter

None

Function

The DAM command deletes all macro definitions made by using the Prescribe 2e MCRO command from the printer's memory. This enables the user to make room for new macros, fonts, or graphics.

File

```
!R! RES; UNIT C;
CMNT Print ENDM file first.;
SFNT "Swiss742SWC-Bold";
MAP 5, 4; CALL SCREEN, 9.2, 1.7;
MAP 7, 5; TEXT 'This text is enclosed by', L;
          TEXT 'SCREEN macro.';
DAM;
MAP 5, 6; CALL 10 BX;
MAP 5, 7; CALL SCREEN, 9.2, 1.7;
MAP 6, 8; TEXT 'SCREEN macro was deleted by DAM.';
PAGE;
EXIT;
```

Printout

This text is enclosed by
SCREEN macro.

SCREEN macro was deleted by DAM.

DAP — Draw to Absolute Position

Format

DAP *x-coordinate, y-coordinate;*

Parameters

x-coordinate:
distance from the left margin

y-coordinate:
distance from the top margin

Function

The DAP command draws a line from the current cursor position to a position specified relative to the top and left margins. The thickness of the line is designated by the SPD (set pen diameter) command. The coordinates and line thickness are measured in the units designated by the UNIT command.

The coordinates may be positive or negative. Negative coordinates cause the line to extend outside the margin.

The DAP command is ignored in the path mode graphics.

File

```
!R! RES;
    UNIT C;
    CMNT Tree Diagram;
    STM 8; SLM 8;
    MAP 0, 0; DAP 2, 0.5;
    MAP 0, 1; DAP 2, 0.5;
    MAP 0, 1; DAP 2, 1.5;
    MAP 0, 2; DAP 2, 1.5;
    MAP 0, 2; DAP 2, 2.5;
    MAP 0, 3; DAP 2, 2.5;
    MAP 2, 0.5; DAP 4, 1;
    MAP 2, 1.5; DAP 4, 1;
    MAP 2, 1.5; DAP 4, 2;
    MAP 2, 2.5; DAP 4, 2;
    MAP 4, 1; DAP 6, 1.5;
    MAP 4, 2; DAP 6, 1.5;
PAGE; EXIT;
```

Printout

DELF — DELete Font

Format

DELF *font-number;*

Parameters

font-number:
number identifying the font to be deleted

Function

The DELF command deletes any designated nonresident font or a font number assigned to a scalable font using the SFNT command from the printer's memory. This enables the user to make room for new fonts, macros, and graphics.

The printer's memory is large but not unlimited, and judicious use of the DELF command may prevent memory overflow. (If a memory overflow occurs, the printer gives an overflow warning message.) The amount of memory still available can be viewed on a printer status page, available by executing the STAT command or pressing the printer's STATUS key.

File

```
!R! UNIT P; SLS 16;
SFNT 'Swiss742SWC-Bold',  15, 2000, 277, 1.5,  0;
SFNT 'Swiss742SWC-Roman', 15, 2001, 277,   1, .5;

FONT 2000; TEXT '1. FAREWELL TO ', E;
FONT 2001; TEXT 'ITALICS', N;
TEXT, N;

DELF 2001;

FONT 2000; TEXT '2. FAREWELL TO ', E;
FONT 2001; TEXT 'ITALICS';

PAGE;
EXIT;
```

Printout

1. FAREWELL TO *ITALICS*

2. FAREWELL TO ITALICS

DELM — DELete Macro

Format

`DELM` *macro-name;*

Parameters

macro-name:
name defined by a previous MCRO command

Function

The DELM command deletes a specified macro definition from the printer's memory to make room for new macros, fonts, or graphics, or so that the same name can be used for another macro.

File

```
!R! UNIT C;
MCRO BX;
SPD .05; BOX .8, -.8; MRP 1, 0;
ENDM;
MCRO SCREEN %, width, depth;
CMNT Draws box with rounded corners;
CMNT Leaves cursor at previous position;
SPD .08;
SCP;
MRP .25, .25; ARC .23, .30, 270, 0;
MRP 0, -.25; DRP %1, 0;
MRP 0, .25; ARC .23, .30, 0, 90;
MRP .27, 0; DRP 0, %2;
MRP -.27, 0; ARC .23, .30, 90, 180;
RPP;
MRP 0, .25; DRP 0, %2;
MRP .25, 0; ARC .23, .30, 180, 270;
MRP 0, .27; DRP %1, 0;
RPP;
ENDM;
SFNT ”Swiss742SWC-Bold”;
MAP 5, 4;
CALL SCREEN, 9.2, 1.7;
MAP 7, 5;
TEXT ’This text is enclosed by’, L;
Text ’SCREEN macro.’;
DELM SCREEN;
MAP 5,8;
CALL SCREEN, 9.2, 1.7;
MAP 6, 10;
TEXT ’SCREEN macro was deleted by DELM.’;
PAGE;
EXIT;
```

Printout

```
This text is enclosed by
SCREEN macro.
```

```
SCREEN macro was deleted by DELM.
```

DPAT — select Dash PATtern

Format

DPAT *number;*

Parameter

number:
number from 1 to 20 (11 to 20 are for user-defined patterns)

Function

The DPAT command specifies the pattern of alternating black and white dashes to stroke the current path.

The resident patterns range in value between 1 and 10. Refer to resident patterns list on page 2-83.

Numbers 11 to 20 are reserved for use with defining particular patterns using the SDP (Store Dash Pattern) command. If you specify a value between 11 to 20 when no user pattern has been defined, the path will be stroked in solid black.

The DPAT command does not affect the line drawn by the standard graphics commands such as DRP, BOX, ARC, etc.

Related Commands

SDP

File

```
!R! RES; UNIT C;
MCRO DPAT;
NEWP;
SPD .2;
SCP;
SFNT ”Swiss742SWC-RomanCondensed”, 10;
TEXT ’DPAT %1’;
PMRP 1.4, -.1; DPAT %1; PDRP 9, 0;
RPP; PMRP 0, .7;
STRK;
ENDM;
MZP 5, 5;
FONT 13;
CALL DPAT,1;
CALL DPAT,2;
CALL DPAT,3;
CALL DPAT,4;
CALL DPAT,5;
CALL DPAT,6;
CALL DPAT,7;
CALL DPAT,8;
CALL DPAT,9;
CALL DPAT,10;
PAGE;
EXIT;
```

Printout

DPAT 1
DPAT 2
DPAT 3
DPAT 4
DPAT 5
DPAT 6
DPAT 7
DPAT 8
DPAT 9
DPAT 10

DRP — Draw to Relative Position

Format

`DRP` *x-coordinate, y-coordinate, ...;*

Parameter

x-coordinate/y-coordinate:
Coordinates as measured from the current cursor position

Function

The DRP command draws a line from the current cursor position to a specified relative position. The thickness of the line is designated by the SPD (set pen diameter) command. The coordinates and line thickness are measured by the value designated by the UNIT command.

Multiple pairs of coordinates may be specified. The printer then draws a connected series of line segments, proceeding from one point to the next. For example, `DRP 1, 2, 3, 4;` is equivalent to `DRP 1, 2; DRP 3, 4;`. The coordinates may be positive or negative.

The DRP command is ignored in the path mode graphics. To add a line segment to a path, use the PDRP (in Path, Draw to Relative Position) command.

Related Commands

PDRP

File

```
!R! RES;
UNIT C; SPD .3;
CMNT Cube;
MZP 5, 10;
DRP 4, 0, 2, -2, 0, -4, -4, 0, -2, 2, 0, 4;
MRP 4, 0;
DRP 0, -4, -4, 0, 4, 0, 2, -2;
PAGE;
EXIT;
```

Printout

DRPA — Draw to Relative Position specified by Angle

Format

DRPA *length, angle;*

Parameters

length:
length of the line

angle:
angle in degrees, measured clockwise from the vertical

Function

The DRPA command draws a line of a specified length at a specified angle, starting from the current cursor position, with the thickness designated by the SPD command.

This command is ignored if placed within a path construction.

File

```
!R! RES; UNIT C;
         MAP  2,  11;
         DRPA 2,  72;
         DRPA 2,   0;
         DRPA 2, 144;
         DRPA 2,  72;
         DRPA 2, 216;
         DRPA 2, 144;
         DRPA 2, 288;
         DRPA 2, 216;
         DRPA 2,   0;
         DRPA 2, 288;
         PAGE;
EXIT;
```

Printout

DUPX — select/deselect DUPleX mode

Format

DUPX *mode;*

Parameters

mode:

a number representing one of the following binding mode:
0=Select simplex mode
1=Select duplex mode, long-edge binding
2=Select duplex mode, short-edge binding

Function

The DUPX command is effective only when the option duplexer is installed to the printer. It instructs the printer to select or deselect duplex printing and sets the binding mode. You can select one of the following types of binding modes.

File/Sample

See the DXPG command page.

DXPG — select DupleX PaGe side

Format

DXPG *side;*

Parameters

side:

a number representing the side of the ensuing page:
0=Select next side (same as with a form feed)
1=Select front side
2=Select back side

Function

The DXPG command is effective only when the option duplexer is installed to the printer. It ends printing on the current page in the same manner as a form feed. However, unlike the form feed, it also selects the paper side, front or back, on which printing of the ensuing page is printed.

The side parameter 1 prints the ensuing page begins on the front side of the next sheet, regardless of whether the current page was printed on the front or back side of the current sheet.

The side parameter 2 prints the ensuing page begins on the back side of the current sheet if the current page was printed on the front side, or on the back side of the next sheet if the current page was printed on the back side.

File

The following example selects the duplex mode with short-edge binding, a portrait page orientation which results in text printing on both sides of the page.

```
!R! CMNT Initiates a Prescribe command sequence; RES;
CMNT Causes a page break and resets parameters;
DUPX 2;
CMNT Selects duplex mode, short-edge binding;
SPO P;
CMNT Selects portrait orientation;
STAK 1;
CMNT Select face-down delivery;
EXIT;
This text prints right-side up on the front side of the page
!R! DXPG 0;
CMNT Ends current page (front side of the paper);
EXIT;
This text prints upside-down on the reverse side of the page
!R! RES; EXIT;
```

Sample

DZP — Draw to Zero-relative Position

Format

DZP *x-coordinate, y-coordinate;*

Parameters

x-coordinate:
distance from the left edge limit of paper

y-coordinate:
distance from the top edge limit of paper

Function

The DZP command draws a line from the current cursor position to a position specified relative to the top and left edge limits of the paper.

The thickness of the line is designated by the SPD (set pen diameter) command. The coordinates and line thickness are measured in the value designated by the UNIT command. The coordinates should be positive or zero. Negative coordinates are treated as zero.

The DZP command is ignored within a path construction. To add a zero-relative line segment in a path, use the PDZP (in Path, Draw to Zero-relative Position) command.

Related Command

PDZP

File

```
!R! RES; UNIT C;
        MZP 0, 0; DZP 0, 5;
        MZP 1, 0; DZP 0, 4;
        MZP 2, 0; DZP 0, 3;
        MZP 3, 0; DZP 0, 2;
        MZP 4, 0; DZP 0, 1;
        MZP 5, 0; DZP 0, 0;
        PAGE;
EXIT;
```

Printout

EMCR — Enable MaCRo by paper input

Format

```
EMCR E, #1 [=#2], [#3] #4 [, #5...];
EMCR D, #1 [=#2];
```

Parameters

#1:

input cassette number
0: multi-purpose feeder (same as CASS 0;)
1: Upper cassette of PF-30 (top) (same as CASS 1;)
2: Lower cassette of PF-30 (top) (same as CASS 2;)
3: Upper cassette of PF-30 (middle) (same as CASS 3;)
4: Lower cassette of PF-30 (middle)
5: Upper cassette of PF-30 (bottom)
6: Lower cassette of PF-30 (bottom)
99: EF-1/UF-1 (same as CASS 4;)

#2:

printing side: 0=front, 1=back

#3:

repeat count

#4:

macro name

#5:

macro parameters

Function

The EMCR command allows separate auto macros to be assigned for each input cassette. In duplex mode, it is also possible to assign separate auto macros for both the front and back printing sides.

EMCR D disables the auto macro for the specified cassette.

The following commands are invalid within a macro:
AMCR, ASTK, CASS, CCPY, DUPX, DXPG, JOBD, JOBL, JOBO, JOBP, JOBS, JOBT, JOG, LDFC, LDFN, MID, MSTK, RDMP, SEM, SPSZ, SSTK, STAK, STAT, STPL, VMAL, VMPW

An error results and the command is ignored if the cassette number does not exist.

ENDC — END carbon Copy

Format

```
ENDC;
```

Function

The CCPY E command definition ends when the printer receives the ENDC command.

Refer to the CCPY E command.

ENDD — END Dump

Format

```
ENDD;
```

Parameter

None

Function

The ENDD command ends a hexadecimal dump initiated by the RDMP (Received-data DuMP) command and returns to the Prescribe command mode.

Related Command

RDMP

File

See the RDMP command page.

ENDM — END Macro

Format

```
ENDM;
```

Parameter

None

Function

The ENDM command ends a macro definition and returns to the Prescribe command mode.

Related Command

CALL, DAM, DELM, MCRO

File

```
!R! RES; DAM; UNIT C;
MCRO BX;
SPD .05; BOX .8, -.8; MRP 1, 0;
ENDM;
MCRO SCREEN %, width, depth;
CMNT Draws box with rounded corners;
CMNT Leaves cursor at previous position;
SPD .08;
SCP; SCP;
MRP .25, .25; ARC .23, .30, 270, 0;
MRP 0, -.25; DRP %1, 0;
MRP 0, .25; ARC .23, .30, 0, 90;
MRP .27, 0; DRP 0, %2;
MRP -.27, 0; ARC .23, .30, 90, 180;
RPP;
MRP 0, .25; DRP 0, %2;
MRP .25, 0; ARC .23, .30, 180, 270;
MRP 0, .27; DRP %1, 0;
RPP;
ENDM;
PAGE;
EXIT;
```

Printout

ENDR — END Raster data

Format

```
ENDR;
```

Parameter

None

Function

The ENDR command declares the end of raster data. To declare the start of raster data, a RVRD command should be used.

File

```
!R! RES; DAM; DAF; UNIT C; SRO 1;
MAP 5, 5;
RVRD;
 5, 0, 0, 7, 0, 0; 5, 0, 0, 24, 192, 0;
 5, 0, 0, 32, 32, 0; 5, 0, 0, 64, 16, 0;
 5, 0, 0, 64, 16, 0; 5, 0, 0, 128, 8, 0; 5, 0, 0, 128, 8, 0;
 5, 0, 0, 128, 8, 0; 5, 0, 0, 64, 16, 0;
 5, 0, 0, 64, 16, 0; 5, 0, 0, 32, 32, 0;
 5, 0, 0, 120, 192, 0; 5, 0, 0, 103, 0, 0;
 5, 0, 0, 96, 0, 0; 5, 0, 0, 144, 0, 0;
 5, 0, 0, 144, 0, 0; 5, 0, 0, 144, 0, 0;
 5, 0, 1, 8, 0, 0; 5, 0, 1, 8, 0, 0;
 5, 0, 1, 136, 0, 0; 5, 0, 2, 68, 0, 0;
 5, 0, 2, 36, 0, 0; 5, 0, 2, 36, 0, 0;
 5, 0, 6, 66, 0, 0; 5, 0, 5, 130, 0, 0;
 5, 0, 4, 6, 0, 0; 5, 0, 8, 9, 0, 0;
 5, 0, 8, 17, 0, 0; 5, 0, 14, 17, 0, 0;
 5, 0, 17, 9, 128, 0; 5, 0, 16, 134, 128, 0;
 5, 0, 16, 128, 128, 0; 5, 0, 32, 128, 64, 0;
 5, 0, 49, 0, 64, 0; 5, 0, 46, 0, 64, 0;
 5, 0, 64, 28, 32, 0; 5, 0, 64, 34, 32, 0;
 5, 0, 64, 65, 32, 0; 5, 0, 128, 65, 16, 0;
 5, 0, 184, 65, 16, 0; 5, 0, 196, 34, 16, 0;
 5, 1, 130, 28, 8, 0; 5, 1, 130, 0, 8, 0;
 5, 1, 130, 0, 120, 0; 5, 2, 68, 0, 132, 0;
```

```
 5, 14, 56, 97, 7, 0; 5, 10, 0, 145, 5, 0;
 5, 11, 255, 255, 253, 0; 5, 8, 0, 0, 1, 0;
 5, 15, 255, 255, 255, 0; 5, 4, 0, 0, 2, 0;
 5, 52, 8, 1, 2, 192; 5, 76, 8, 1, 3, 32;
 5, 76, 8, 1, 3, 32; 5, 68, 62, 7, 194, 32;
 5, 34, 8, 1, 4, 64; 5, 34, 8, 1, 4, 64;
 5, 18, 8, 1, 4, 128; 5, 13, 0, 0, 11, 0;
 5, 1, 0, 0, 8, 0; 5, 0, 128, 0, 16, 0;
 5, 0, 131, 12, 16, 0; 5, 0, 64, 144, 32, 0;
 5, 0, 160, 96, 80, 0; 5, 1, 24, 1, 136, 0;
 5, 14, 134, 6, 23, 0; 5, 48, 65, 248, 32, 192;
 5, 192, 129, 8, 16, 48; 5, 0, 64, 144, 32, 0;
 5, 0, 32, 96, 64, 0; 5, 0, 16, 0, 128, 0;
 5, 0, 32, 0, 64, 0; 5, 0, 16, 0, 128, 0;
 5, 0, 8, 1, 0, 0; 5, 0, 6, 6, 0, 0;
 5, 0, 1, 104, 0, 0; 5, 0, 0, 144, 0, 0;
ENDR;
PAGE;
EXIT;
```

Printout

EPL — select EcoPrint Level

Format

EPL *level;*

Parameter

level:

0= OFF (Ecoprint is off)
1= — (Light)
2= ON (Medium)
3= — (Dark)

Function

The EPL command selects the magnitude of Ecoprint. This standard feature of FS-series printers enables the user to reduce the amount of toner placed on the page which saves on printing costs. With the level of 1 (light) or 2 (medium), the printing image appears lighter, yet remains readable.

Only one EPL level is possible for a page. If more than one EPL command are put on a page, the last one is effective.

The Ecoprint setting does not effect print speed.

The following example simulates typical Ecoprint use:

0 = Ecoprint setting is Off (default/OFF) | 1 = (Light) | 2 = ON (Medium) | 3 = (Dark)

File

```
!R! RES; SFNT "Swiss742SWC-Bold", 24;
SLPI 3;
EPL 2; TEXT "Ecoprint is ON (Medium)";
PAGE;
EXIT;
```

Sample

Ecoprint is ON (Medium)

EPRM — read/list EPRoM data

Format

EPRM *mode, data-type, 'data-name' ;*

Parameter

mode:
R=read data
L=output a list of data

data-type:
2 (Valid when mode is R.)

data-name:
Name of data in the EPROM to read when mode is R

Function

The EPRM command reads and lists the contents of the optional EPROM already inserted in the printer's onboard socket and in the internal memory. The mode parameter should be *R* for reading data and *L* for printing a list of the contents. Mode L (printing a list of data) may be used to doublecheck the contents name in the EPROM before reading the data using R mode.

Currently, the *data type* should always be *2*.

The *data-name* specifies the name of the data in the EPROM to be read. The EPRM command is ignored if this parameter is omitted.

The printable data list appears as follows:

EPROM data list example

```
                    OPTION ROM   STATUS   PAGE

--------------------------------------------------------------------------------

  --Partition--        --Name--          --Size--       --Type--

        1                                 25144          Font
        2              rel_6828.em        9324          Code
        3              FS1500A.DEM        298988        Data
        4              TEST-PRINT2        8868          Data
        5              123                328           Mcro
        6              VLIN               60            Mcro
        7              FORM               116           Mcro
        8              HLIN               60            Mcro
        9              DANISH-ROMAN8      8192          Mesg
       10              Debugger           2048          Void
       11              ITALIAN-ROMAN8     8448          Mesg
       12              SPANISH-ROMAN8     8448          Mesg
       13              SWEDISH-ROMAN8     8192          Mesg
--------------------------------------------------------------------------------

                                     --Total Size--

                                        378216
```

This sample of the EPROM data list includes the following information:

Partition (data) number
Reference number of written data for each partition.

Name
The destination name of the written data as assigned automatically by the printer.

Size
The size of the written data in bytes.

Type
The type of the written data as to whether it is host data (Data), font data (Font), etc.

Total size
The total amount of data used by all the partitions.

EXIT — EXIT from Prescribe mode

Format

```
EXIT [, E];
```

Parameter

None

Function

When the printer receives the EXIT command, it exits from the Prescribe mode and treats the following information as characters to be printed.

If the parameter E is added (`EXIT, E;`), the printer ignores one carriage-return/linefeed immediately following the command.

File

```
!R! RES; SFNT "Swiss742SWC-Roman";
Commands ending in EXIT; leave a gap
in the output,
!R! CMNT Like this; EXIT;
while commands ending in EXIT, E;
!R! CMNT Like this; EXIT, E;
leave no trace of their presence except
possibly a shortage of lines on the page.
!R! PAGE; EXIT;
```

Printout

Commands ending in EXIT; leave a gap
in the output,

while commands ending in EXIT, E;
leave no trace of their presence except
possibly a shortage of lines on the page.

FDIR — MP tray Feed DIRection

Format

FDIR *direction*;

Parameters

0: Lengthwise
1: Widthwise

Function

This command specifies the paper orientation during feeding when the current paper source is the MP tray. It is only possible to select the paper orientation when the MP tray is selected and the paper is A4 or letter size. This command is enabled only when the MP tray's operational mode is *cassette* or *manual feed*, since printing on A4 and letter size paper can only be done widthwise in *first* mode.

This command causes a page break.

This command is disabled for cassette feeding and feeding by UF-1/EF-1.

The paper orientation setting is restored to the default (FRPO T8) when the printer receives the RES command.

A command error results and the command has no effect if parameters other than the above are used.

FILL — FILL closed path

Format

`FILL` *rule*;

Parameters

rule:

drawing rule:
1=use even-odd rule
2=use non-zero winding number rule

Function

The FILL command fills the area enclosed by the current path with the current drawing rule. It also fills all independent subpaths contained in a path. An open subpath is implicitly closed before being painted (as done by a CLSP command). This command clears the current path after filling and moves the cursor to the end of that path.

With drawing rule 1, even-odd, whether or not a point is deemed to be inside the path is determined by drawing a ray from that point in any direction and counting the number of times the ray crosses segments of the path. The point is deemed to be inside the path if the result is an odd number; if the result is an even number, the point is deemed to be outside the path.

The non-zero winding rule also draws a ray from a point in any direction to determine whether or not that point is deemed to be inside the path and examines the points at which a segment of the path crosses the ray. However, it then starts counting from zero and adds one each time a segment in the path crosses the ray from left to right; and subtract one each time a segment in the path crosses the ray from right to left. If the result of counting all the crossings is zero, the point is deemed to be outside; otherwise the point is deemed to be inside the path.

The way in which several filled-in parts are stacked with each other to produce transparent and opaque effects is controlled by the SIMG (Set IMaGe model) command.

Related Commands

FPAT, GPAT, PAT, SIMG, XPAT

File

```
!R! RES; UNIT C; SIMG 1;
CMNT Drawing clusters;
NEWP;
PMZP 10, 12; PDRP -5.7, -1.75;
PCRP 0, 0, 0, -3.4, 3.1, -3.6; CLSP; PAT 2; FILL;
PMZP 10, 12; PDRP -2.6, -5.35;
PCRP 0, 0, 2.5, -2.5, 4.9, .1; CLSP; PAT 3; FILL;
PMZP 10, 12; PDRP 5.7, -1.75;
PCRP 0, 0, 0, -3.5, -3.4, -3.5; CLSP; PAT 4; FILL;
PMZP 12, 12; PDRP 5.7, -1.75;
PCRP 0, 0, 1.5, 1.75, 0, 3.5; CLSP; PAT 5; FILL;
PMZP 10, 12; PDRP -5.7, 1.75;
PCRP 0, 0, 0, 3.4, 3.1, 3.6; CLSP; PAT 6; FILL;
PMZP 10, 12; PDRP -2.6, 5.35;
PCRP 0, 0, 2.5, 2.5, 4.9, -.1; CLSP; PAT 7; FILL;
PMZP 10, 12; PDRP 5.7, 1.75;
PCRP 0, 0, 0, 3.5, -3.4, 3.5; CLSP; PAT 8; FILL;
PMZP 10, 12; PDRP -5.7, 1.75;
PCRP 0, 0, -1.5, -1.75, 0, -3.5; CLSP; PAT 9;
FILL;
PAGE;
EXIT;
```

Printout

FLAT — set FLATness

Format

FLAT *flatness*;

Parameters

Flatness:
number from 1 to 100

Function

The FLAT command determines how smoothly curves in paths are to be drawn when a STRK or FILL command is used. Higher number values produce rougher curves and lower number values create smoother curves which require greater computation. The number actually specifies the maximum error tolerance of a straight line segment approximation of any portion of the curve.

The printer resets the flatness to *1* when it receives a RES command.

File

```
!R! RES; UNIT C; SPD .02;

NEWP; CMNT 1st circle (FLAT 1);
PMRA 7, 16.5, 2, 0;
PARC 7, 16.5, 2, 0, 360;
STRK;

NEWP; CMNT 2nd circle (FLAT 50);
FLAT 50;
PMRA 12, 16.5, 2, 0;
PARC 12, 16.5, 2, 0, 360;
STRK;

PAGE; EXIT;
```

Printout

FLST — print Font LiST

Format

```
FLST;
```

Parameter

None

Function

The FLST command prints a list of the page printer's resident fonts on several pages. A list of nonresident fonts, downloaded from software, or read from IC cards, is printed on the second and subsequent pages produced by the STAT command or STATUS panel key.

For each bitmap font, the list specifies the typeface name, the FSET parameters, the Prescribe font numbers for portrait and landscape orientations, the point size and cpi, and a sample of upper and lowercase characters.

For each scalable font, the list specifies the same, except for orientation, point size and cpi.

Related Commands

FSET, SFNT, STAT

File

```
!R! FLST; EXIT;
```

Sample of Font List (The list differs for different models.)

Internal Scalable and Bitmapped Fonts List — **Prescribe**

Font Name	Scalable/Bitmap	Password	Selection [FSET]	Font ID
Courier	<Scalable>	None	FSET 0p##h0s0b4099T;	I000
CGTimes	<Scalable>	None	FSET 1p##v0s0b4101T;	I001
CGTimes-Bd	<Scalable>	None	FSET 1p##v0s3b4101T;	I002
CGTimes-It	<Scalable>	None	FSET 1p##v1s0b4101T;	I003
CGTimes-BdIt	<Scalable>	None	FSET 1p##v1s3b4101T;	I004
CGOmega	<Scalable>	None	FSET 1p##v0s0b4113T;	I005
CGOmega-Bd	<Scalable>	None	FSET 1p##v0s3b4113T;	I006
CGOmega-It	<Scalable>	None	FSET 1p##v1s0b4113T;	I007
CGOmega-BdIt	<Scalable>	None	FSET 1p##v1s3b4113T;	I008
Coronet	<Scalable>	None	FSET 1p##v1s0b4116T;	I009
Clarendon-Cd	<Scalable>	None	FSET 1p##v4s3b4140T;	I010
Univers-Md	<Scalable>	None	FSET 1p##v0s0b4148T;	I011
Univers-Bd	<Scalable>	None	FSET 1p##v0s3b4148T;	I012
Univers-MdIt	<Scalable>	None	FSET 1p##v1s0b4148T;	I013
Univers-BdIt	<Scalable>	None	FSET 1p##v1s3b4148T;	I014
Univers-MdCd	<Scalable>	None	FSET 1p##v4s0b4148T;	I015
Univers-BdCd	<Scalable>	None	FSET 1p##v4s3b4148T;	I016
Univers-MdCdIt	<Scalable>	None	FSET 1p##v5s0b4148T;	I017
Univers-BdCdIt	<Scalable>	None	FSET 1p##v5s3b4148T;	I018
AntiqueOlive	<Scalable>	None	FSET 1p##v0s0b4168T;	I019
AntiqueOlive-Bd	<Scalable>	None	FSET 1p##v0s3b4168T;	I020
AntiqueOlive-It	<Scalable>	None	FSET 1p##v1s0b4168T;	I021
GaramondAntiqua	<Scalable>	None	FSET 1p##v0s0b4197T;	I022
Garamond-Hlb	<Scalable>	None	FSET 1p##v0s3b4197T;	I023
Garamond-Krsv	<Scalable>	None	FSET 1p##v1s0b4197T;	I024
Garamond-HlbKrsv	<Scalable>	None	FSET 1p##v1s3b4197T;	I025
Marigold	<Scalable>	None	FSET 1p##v0s0b4297T;	I026
Albertus-Md	<Scalable>	None	FSET 1p##v0s1b4362T;	I027
Albertus-ExtBd	<Scalable>	None	FSET 1p##v0s4b4362T;	I028
Arial	<Scalable>	None	FSET 1p##v0s0b16602T;	I029
Arial-Bd	<Scalable>	None	FSET 1p##v0s3b16602T;	I030
Arial-It	<Scalable>	None	FSET 1p##v1s0b16602T;	I031
Arial-BdIt	<Scalable>	None	FSET 1p##v1s3b16602T;	I032
TimesNewRoman	<Scalable>	None	FSET 1p##v0s0b16901T;	I033
TimesNewRoman-Bd	<Scalable>	None	FSET 1p##v0s3b16901T;	I034
TimesNewRoman-It	<Scalable>	None	FSET 1p##v1s0b16901T;	I035
TimesNewRoman-BdIt	<Scalable>	None	FSET 1p##v1s3b16901T;	I036
Helvetica	<Scalable>	None	FSET 1p##v0s0b24580T;	I037
Helvetica-Bd	<Scalable>	None	FSET 1p##v0s3b24580T;	I038
Helvetica-Ob	<Scalable>	None	FSET 1p##v1s0b24580T;	I039
Helvetica-BdOb	<Scalable>	None	FSET 1p##v1s3b24580T;	I040

FONT — change current FONT

Format

`FONT` *font-number*;

Parameters

font-number:
number identifying the font

Function

The FONT command specifies a typeface for all text that follows.

The font-number should designate a resident bitmap font, a scalable font using the SFNT command, or a nonresident font generated by the LDFC command or downloaded from an IC card or computer. If an undefined font-number is specified, the font will not change.

To print a font list, use the Prescribe FLST command.

For a bitmap font, depending on the font mode (FTMD) value, the FONT command also sets the line and character spacing and page orientation to match the attributes of the selected font. The scalable fonts, however, ignore the font mode setting. Line spacing must be specified by the user in this case using one of the line spacing commands (SLS, SLPI, etc.).

Note: **The FONT command is valid only for models that have resident bitmap fonts (LinPrinter FS-1750/3750 and later).**

Related Commands

ALTF, FLST, SETF

File

```
!R! RES; UNIT P;
SFNT 'Swiss742SWC-BoldItalic', 18, 2000;
SFNT 'Swiss742SWC-BoldItalic', 14, 2001;
FONT 2000;
EXIT;
—- Font Guideline —-
!R! FONT 2001; EXIT;
Be distinctive.
!R! FONT 13; FTMD 15; EXIT;
Use different font sizes and styles to set off titles,
headings, footnotes, etc.
!R! PAGE; EXit;
```

Printout

--- Font Guideline ---

Be distinctive.

Use different font sizes and styles to set off titles,
headings, footnotes, etc.

FPAT — generate Fill PATtern

Format

FPAT #, #, #, #, #, #, #, #;

Parameters

#:

number from 0 to 255

Function

The FPAT command establishes a new shading pattern, for use by the BLK, ARC, and FILL commands, as described in a 8 × 8 matrix of dots.

Each number corresponds to one row of 8 dots. The value of the number is calculated according to the black dots in its row, counting 1 for a black dot in the rightmost column, 2 for a black dot in the next column left, 4 for a black dot in the next column, and so on.

FPAT Parameters

To calculate the third number in the example above, add up the values of the columns that have black dots in the first row: 16+8=24.

To calculate the forth number in the example above, add up the values of the columns that have black dots in the second row: 32+16+8+4=60, and so on.

For printer models that support 600/1200 dpi resolution printing, the default resolution generated by the FPAT command is 300 dpi; however, 600/1200 dpi can be selected using the FRPO B8 command. See section 5.2 in *Chapter 5* (FRPO B8). The printer recognizes a dot in the pattern as having the size of 1/300 inch in the 300 dpi resolution, and 1/600 inch in the 600 dpi resolution, and 1/1200 inch in the 1200 dpi resolution.

For an all-white row, specify 0. The FPAT command for creating all white rows is specified below:

```
FPAT 0, 0, 24, 60, 60, 24, 0, 0;
```

For an all-black row, specify 255 (1 + 2 + 4 + 8 + 16 + 32 + 64 + 128 = 255). The default value is `FPAT 255, 255, 255, 255, 255, 255, 255, 255;` giving a solid black pattern which is equivalent to the PAT 1; command.

File

```
!R! RES; DAM; UNIT C;
FSET 1p08V0s0b5T;
MCRO PATTERN;
FPAT %1, %2, %3, %4, %5, %6, %7, %8;
BOX 5, 1; BLK 5, 1; MRP 0, 1.55;
TEXT 'FPAT %1, %2, %3, %4, %5, %6, %7, %8;', L;
ENDM;
MAP 2, 2; SCP;
CALL PATTERN, 3, 3, 0, 0, 0, 0, 0, 0;
CALL PATTERN, 255, 0, 0, 0, 0, 0, 0, 0;
CALL PATTERN, 1, 1, 1, 1, 1, 1, 1, 255;
RPP; MRP 5.5, 0;
CALL PATTERN, 0, 0, 24, 60, 60, 24, 0, 0;
CALL PATTERN, 1, 2, 4, 8, 16, 32, 64, 128;
CALL PATTERN, 8, 8, 8, 8, 8, 8, 8, 8;
PAGE;
EXIT;
```

Printout (300 dpi)

FPAT 3,3,0,0,0,0,0,0;

FPAT 0,0,24,60,60,24,0,0;

FPAT 255,0,0,0,0,0,0,0;

FPAT 1,2,4,8,16,32,64,128;

FPAT 1,1,1,1,1,1,1,255;

FPAT 8,8,8,8,8,8,8,8;

FRPO — Firmware RePrOgram

Format

FRPO *parameter*, *value*;

Parameters

parameter:
parameter stored in permanent memory

value:
new parameter value

Function

The FRPO command sets the printer's power-up emulation mode and other parameters stored in permanent memory. Each parameter is identified by a code consisting of a letter and a numeral, such as P1. Details of the parameters and their values are given in *Chapter 5*.

The FRPO command effects values for interface dependent and non-interface dependent parameters as they appear on the Printer Status Page. Changes to the interface dependent parameters will effect the current interface only.

The FRPO command should be used only when it is necessary to change a parameter permanently. They are not effective as temporary changes in the middle of a print job.

Changes made with FRPO commands can be reset to the factory-set values by the FRPO INIT (FRPO-INITialize) command. Note that the RES command does not reset those changes made with the FRPO command.

Related Command

FRPO INIT

File

```
!R!
FRPO P1, 1; CMNT To power up in the IBM emulation;
FRPO P3, 2; CMNT To change the linefeed action to
CR+LF;
FRPO U6, 9; CMNT To select the US Legal character
set;
EXIT;
US Legal characters:
\^{|} ~

!R! PAGE; EXIT;
```

Printout

```
US Legal characters:
®©§¶†™
```

FRPO INIT — FRPO-INITialize

Format

```
FRPO INIT;
```

Parameter

None

Function

The FRPO INIT command resets all FRPO parameters to their original, factory default values. This reset applies to the interface dependent parameters for the current interface as well as all non-interface dependent parameters. For a list of the factory default values, see *Chapter 5*.

The FRPO INIT command causes a page break.

To activate the changes made with the FRPO INIT command, turn the printer power off then on again or reset the printer using the control panel keys.

File

```
!R! FRPO INIT; EXIT;
```

Printout

Omitted

FSET — change current Font SETting by characteristic

Format

FSET *spacing-pitch-height-style-weight-typeface*;

Parameters

spacing:
fixed or proportional spacing, followed by a terminator P:
0=fixed font
1=proportional font

pitch:
pitch in cpi, from 0.44 to 99.99 cpi (ignored in a proportional font), followed by a terminator H

height:
the line-to-line spacing in points from 0.25 to 999.25; followed by a terminator V

style:
upright or italic, followed by a terminator S:
0=upright
1=italic
4=condensed
5=condensed italic

weight:
degree of bolding, -7 to +7; followed by a terminator B:
-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

typeface:

typeface as represented by one of the following numbers, followed by a terminator T:
0=LinePrinterBM
3=CourierBM
4=Swiss721BM
5=Dutch801BM
6=LetterGothicBM
8=PrestigeEliteBM
4099=CourierSWC* (Courier)
4101=Dutch801SWC (CG Times)
4102=LetterGothicSWC* (Letter Gothic)
4113=ZapfHumanist601SWC* (CG Omega)
4116=Ribbon131SWC* (Coronet)
4140=ClarendonSWC* (Clarendon Condensed)
4141=ZapfDingbatsSWC**
4148=Swiss742SWC (Univers Bold)
4168=Incised901SWC* (Antique Olive)
4197=OriginalGaramondSWC* (Garamond Antique)
4297=AudreyTwoSWC* (Marigold)
4362=Flareserif821SWC* (Albertus Extra Bold)
16602=Swiss721SWM* (Arial)
16686=Symbol-Set-SWM* (Symbol)
16901=Dutch801SWM* (Times New Romen)
24579=(CourierPS)
24591=(Palatino)
24580=(Helvetica)
24607=(ITC Avant Garde Gothic Book)
24703=(New Century Schoolbook Bold)
24623=(ITC Bookman demi)
25093=(Times Bold)
31402=MoreWingbatsSWM* (Wingdings)
45099=(ITC ZapfChancery Medium Italic)
45101=(ITC Zapf Dingbats)
45358=(Symbol PS)

The names in parentheses are the names on models with Agfa fonts resident.

* FS-1600/3600/6500 (each including type A) only
** FS-400/1550/3400 (each including type A) only

The typeface values for option fonts, if installed, can be obtained by printing a font list. To print a font list, use the FLST command or the control panel keys.

Function

The FSET command can be used to select either bitmap fonts or scalable fonts. It is also convenient for changing one or several characteristics of the current font, *e.g.* changing the upright style to italic. The example at the end of this section demonstrates this function.

Font selection is made based on the characteristics of the font, the font's location in the printer, and the font's orientation. In the list below, the characteristics of font are listed in order of priority, from highest to lowest:

Symbol set	Highest Priority Selection
Spacing (pitch)	↑
Point size (height)	
Style	
Stroke weight	
Typeface family	
Location	↓
Orientation	Lowest Priority Selection

In selecting a font, the printer engages in a process of elimination. It first examines all fonts to match based on symbol set (the highest priority). All matches are next examined based on spacing. When the printer has reduced the matches to one font, it selects that font. Bitmap fonts have priority over scalable fonts.

FSET enables the user to select a general class of font first, then specify characteristics (e.g. size and appearance) later. It is still preferable to specify all font parameters to ensure correct selection.

The *pitch* and *height* parameters are measured in cpi and points respectively, regardless of the current unit setting (UNIT).

Terminators following each parameter (P, H, V, S, B, and T) can use either lowercase or uppercase.

The example below shows an FSET command sequence that selects the fixed-pitch (0p), 12-cpi (12h), 12-point (12v), upright-style (0s), normal stroke weight (0b), Letter Gothic (6T) font. This command sequence may be followed by a CSET command which selects the desired symbol set.

File

```
!R! UNIT P; SFNT ’Swiss742SWC-Roman’, 10; SLS 12;
EXIT;
First, this line is printed in a 10 point
Swiss742SWC-Roman font.

!R! FSET 14V; SLS 16; EXIT, E;
Let’s see if the height parameter is changed to 18
points by FSET 18V;.

!R! FSET 1s3B; EXIT,E;
Now this line demonstrates what happens with FSET
1s3B;.
Only the style and stroke weight are changed.

!R! FSET 4101T; SLS 14; EXIT,E;
The FSET 4101T; command switches the typeface to
Dutch801SWC. All other characteristics remain
unchanged.

!R! FSET 0P; FTMD 15; EXIT,E;
Now the FSET 0P; command requests a fixed pitch
font. The method for selecting this font is based
on the change from the previous pitch
characteristic.

!R! PAGE; EXIT;
```

Printout

First, this line is printed in a 10-point Swiss742SWC-Roman font.

Let's see if the height parameter is changed to 18 points by FSET 18V;.

Now this line demonstrates what happens with FSET 1s3B;. Only the style and stroke weight are changed.

The FSET 4101T; command switches the typeface to Dutch801SWC. All other characteristics remain unchanged.

Now the FSET 0P; command requests a fixed pitch font. The method for selecting this font is based on the change from the previous pitch characteristics.

FTMD — bitmap FonT MoDe

Format

`FTMD` *value*;

Parameters

value:
an integer from 0 to 15

Function

The FTMD command determines which attributes will be changed automatically when a bitmap font is selected by the FONT, ALTF, or RPF command. The attributes and values appear as follows:

Horizontal motion index (character spacing)=1
Vertical motion index (line spacing)=2
Fixed or proportional spacing=4
Portrait or landscape orientation=8

The values 1, 2, 4, and 8 change a single font attribute using the FTMD command. When the FTMD command is executed, the printer adjusts the designated attributes of the current font. Later, if the current font is changed by a FONT, ALTF, or RPF command, the printer automatically changes the designated attributes to the values of the new font. The default value of the FTMD command depends on the emulation mode.

The printer does not automatically change any attributes not designated by the FTMD command. If necessary, these attributes must be adjusted by other commands: SCS or SCPI for the character spacing; SLS or SLPI for the line spacing; and SPO for the page orientation.

The FTMD command is ignored when the current font is a scalable font.

Font Mode Values

Font mode	Automatic changes			
	Character spacing	Line spacing	Fixed or proportion	Portrait or landscape
0				
1	Yes			
2		Yes		
3	Yes	Yes		
4			Yes	
5	Yes		Yes	
6		Yes	Yes	
7	Yes	Yes	Yes	
8				Yes
9	Yes			Yes
10		Yes		Yes
11	Yes	Yes		Yes
12			Yes	Yes
13	Yes		Yes	Yes
14		Yes	Yes	Yes
15	Yes	Yes	Yes	Yes

Default Font Modes

Emulation mode	Font mode	Printer's action when font is changed
0 (Line Printer)	15	Adjusts page orientation, character spacing, line spacing.
1 (IBM X-24E) or 2 (Diablo 630)	0	Does not adjust anything.
5 (Epson LQ-850)		
6 (HP LaserJet)	13	Adjusts page orientation and character spacing. Does not adjust line spacing.
8 (KC-GL)		

File

```
!R! RES; SLM 1; STM 2;
FTMD 5;
CMNT Character spacing is automatically adjusted
at each font change, but line spacing and page
orientation are left alone;
UNIT C; SLS 1;
BOX .5, -.5; MRP 1, 0; FONT 47;
TEXT 'Font 47, correctly spaced at 16.6 cpi', N;
BOX .5, -.5; MRP 1, 0; FONT 37;
TEXT 'Font 37, correctly spaced at 10 cpi', N;
BOX .5, -.5; MRP 1, 0; FONT 52;
TEXT 'Font 52, proportionally spaced', N;
BOX .5, -.5; MRP 1.1, -.1; FONT 26;
CMNT Landscape font in portrait orientation;
TEXT '=<><><><><><><><><><><><><><><><><=';
RES;
EXIT;
```

Printout

Font 47, correctly spaced at 16.6 cpi

Font 37, correctly spaced at 10 cpi

Font 52, proportionally spaced

||V^V^V^V^V^V^V^V^V^V^V^V^V^V^V^V^V^V^V||

GPAT — set Gray PATtern

Format

GPAT *gray-level*;

Parameters

gray-level:
any number from *0* (black) to *1* (white)

Function

The printer produces 32 levels of gray shade. The GPAT command specifies the shade of gray for painting a block in the standard mode and path mode graphics. Numbers with up to four decimal places are accepted. The default value is *0* (solid black).

For printer models that support 600/1200 dpi resolution printing, the default resolution generated by the GPAT command is 300 dpi; however, 600/1200 dpi can be selected using the FRPO B8 command. See section 5.2 in *Chapter 5* (FRPO B8). The printer recognizes a dot in the pattern as having the size of 1/300 inch in the 300 dpi resolution, and 1/600 inch in the 600 dpi resolution, and 1/1200 inch in the 1200 dpi resolution.

Related Commands

FPAT, PAT

File

```
!R! RES; UNIT C;
MCRO GP;
NEWP;
GPAT %1;
PDRP 2, 0, 0, 2, -2, 0, 0, -2;
FILL 1;
PMRP .5, .5;
ENDM;
CALL GP,0;
CALL GP,.125;
CALL GP,.25;
CALL GP,.375;
CALL GP,.5;
CALL GP,.625;
CALL GP,.75;
CALL GP,.875;
PAGE;
EXIT;
```

Printout

ICCD — read/write IC-CarD

Format

`ICCD` *mode, slot, data type, 'partition name'*;

Parameters

mode:
R=Read data
W=Write data

slot:
A or B

data type:
Type of data written. (Only type 2 data is supported.)

partition name:
Name of partition to or from which data is written or read

Function

The ICCD command reads or writes data to or from a memory card in one of the printer's memory card slots. Note that you should always use memory cards which is in compliance with PCMCIA 2.1 (JEIDA Version 4.2)* and recommended by Kyocera. If no card is present in the specified slot, this command is ignored.

The partition name may be a maximum of 15 printable ASCII characters (20H through 7EH); upper and lowercase letters are regarded as distinct. A partition name may not have leading spaces, and in the command, the partition name must be enclosed in single or double quotation marks.

The ICCD command cannot be used in macros.
This command is not valid for models that do not have a memory card slot.

When the printer receives the ICCD command in *R* mode, it reads a partition from the memory card.

* For some models, the version that is supported differs.
For details on which version is supported, refer to the User's Manual for the printer.

Example of reading from a memory card:

Reading partition *DataS001* from the memory card in slot A.

1. Verify the printer's message display indicates `Ready`.

2. Enter the following at the DOS prompt:

```
C:\>ECHO !R! ICCD R, A, 2, 'DataS001'; EXIT; >PRN
```

This command instructs the printer to read data from partition *DataS001* into the printer's internal memory.

The following example demonstrates how data is sent from the computer to a memory card. Typically, partition names should be specified when writing to the card. If omitted, the partition names will be assigned automatically as follows:

DataS001, DataS002 ... DataSnnn.

Example of writing to a memory card:

Writing the contents of file *DATA123.DOC* to partition *DATA123* on the memory card in slot B.

1. Verify the printer's message display indicates `Ready`.

2. Enter the following at the DOS prompt:

```
C:\>ECHO !R! ICCD W, B, 2, 'DATA123'; >PRN
```

The message display will change from `Ready` to `Processing`, and then to `Waiting`. The printer is now ready to receive data, so send the file from the computer to the printer. Do not press the FORM FEED key to clear the waiting message.

3. To do this, enter the following at the DOS prompt:

```
C:\>COPY DATA123.DOC PRN
```

4. The message display will change to `Processing` as the file is written to partition *DATA123* on the memory card. Next, check that the message display has changed to `Waiting`, and then send a WRED command, as follows:

```
C:\>ECHO WRED; EXIT, E; >PRN
```

The WRED command terminates writing to the memory card. Alternatively, you can terminate writing by pressing the FORM FEED key on the printer front panel.

Note that in *W* mode the ICCD command is accompanied by a form feed.

If a partition name conflict occurs when writing a new partition to a memory card, the name of the new partition will be modified as follows:

- If a partition name of 11 characters or less conflicts with an existing partition name, 'S*nnn*' (*nnn* represents a numeric value) is appended to the partition's name.
- If a partition name of 12 or more characters conflicts with an existing partition name, the 12th and following characters of the new partition's name will be replaced by 'S*nnn*' (*nnn* represents a numeric value).

Related Command

WRED

INTL — InterNaTionaL characters

Format

`INTL` *country-code*, *code-set*;

Parameters

country-code:

0=US ASCII
1=France
2=Germany
3=UK
4=Denmark/Norway
5=Sweden
6=Italy
7=Spain
8=Japan
9=US Legal
10=IBM PC-850 (Multilingual)
11=IBM PC-860 (Portuguese)
12=IBM PC-863 (Canadian French)
13=IBM PC-865 (Norwegian)
14=Norway
15=Denmark 2
16=Spain 2
17=Latin America

code-set:

0=Epson code set
1=HP LaserJet code set
2=Daisywheel code set
3=Reserved
4=IBM/Line Printer code set

Function

The INTL command selects a symbol set appropriate for the alphabet of a particular country. A symbol set includes the specific alphabetic and numeric characters and other symbols of a particular written language, country, or software application. Charts of the available symbol sets are displayed in *Chapter 6*, emulation by emulation.

Depending on the current emulation, the printer selects one of the symbol sets of the emulated printer appropriate for the country as requested by the *country-code* value. For example, when the printer is set in the default emulation mode 6 (HP LaserJet), country code 0 (US ASCII) selects the ISO-6 ASCII symbol set of the HP LaserJet printer. If the current emulation mode is 1 (IBM), country code 0 selects the IBM US symbol set of the IBM Proprinter.

Differences in symbol sets can be seen in the upper half of the character code table, consisting of character codes 128 through 254 (hex 80 through FE). The availability of the symbol sets to the country-code values appear in the table on the following page.

For example, the character assigned to character code 93 (hex 5D) varies according to the country code as follows:

US	]
France	§
Germany	Ü
Denmark	Å
Italy	é
Spain	¿

The *code-set* parameter adjusts for the different symbol sets. According to the *code-set* parameter specified, the printer selects a symbol set available to the current emulation.

The default *country-code* value appears as the U6 parameter and can be set using an FRPO command. The factory setting is 0: the standard US ASCII symbol set. The default code-set value appears as the U7 parameter. The factory setting is 0.

Symbol Sets Available With INTL

Country-code	Code-set (emulation)			
	0 (Epson)	1 (HP LaserJet) **	2 (Daisywheel)	4 (IBM/Line Printer)
0* (US ASCII)	LQ US	ISO-6 ASCII	Diablo US	IBM US
1 (France)	LQ France	ISO-25 France	Diablo France	
2 (Germany)	LQ Germany	HP German	Diablo Germany	
3 (UK)	LQ U.K.	ISO-4 U.K.	Diablo U.K.	
4 (Denmark/Norway)	LQ Denmark	ISO-60 Norway	Diablo Denmark	IBM D/N
5 (Sweden)	LQ Sweden	ISO-11 Swedish	Diablo Sweden	
6 (Italy)	LQ Italy	ISO-15 Italian	Diablo Italy	
7 (Spain)	LQ Spain	HP Spanish	Diablo Spain	
8 (Japan)	LQ Japan	ISO-14 JIS ASCII	Diablo Japan	
9 (US Legal)	LQ US Legal	US Legal	US Legal	US Legal
10 (IBM PC-850)	IBM PC-850	IBM PC-850		IBM PC-850
11 (IBM PC-860)	IBM PC-860	IBM PC-860		IBM PC-860
12 (IBM PC-863)	IBM PC-863	IBM PC-863		IBM PC-863
13 (IBM PC-865)	IBM PC-865	IBM PC-865		IBM PC-865
14 (Norway)	LQ Norway			
15 (Denmark 2)	LQ Denmark 2			
16 (Spain 2)	LQ Spain 2			
17 (Latin America)	Latin America			

* Factory-set (default) value.

** The INTL command is primarily intended to access foreign characters not found in a current symbol set. (Default is US ASCII). It does not fully support all of the HP LaserJet symbol sets. To use one of the HP symbol sets not listed above, see the CSET command page.

File

```
!R!
CMNT This file will not print correctly in the
IBM;
CMNT emulation (mode 1);
RES; INTL 2, 2; SLM 1; STM 2;
SFNT ”Swiss742SWC-Roman”, 14;
EXIT;
Diese [pfel sind eine ]berraschung!
!R! PAGE; EXIT;
```

Printout

Diese Äpfel sind eine Überraschung!

JOBD — JOB Deletion

This command is an MPS command.

Function

Deletes a job from the hard disk.

For a detailed explanation of this command, refer to Chapter 7, "Prescribe Commands for MPS Management."

JOBL — print JOB List

This command is an MPS command.

Function

Prints a list of the jobs that are currently stored.

For a detailed explanation of this command, refer to Chapter 7, “Prescribe Commands for MPS Management.”

JOBO — JOB Output

This command is an MPS command and a VMB command.

Function

MPS: Reprints a job that is in the hard disk.
VMB: Reprints a VMB job.

For a detailed explanation of this command, refer to Chapter 7, "Prescribe Commands for MPS Management," or Chapter 9, "Virtual Mail Box (VMB) Specifications."

JOBP — JOB output Parameter setting

This command is an MPS command and a VMB command.

Function

MPS: Changes the settings for a job that has been defined.
VMB: Sets the capacity of virtual mailboxes and adds mailboxes.

For a detailed explanation of this command, refer to Chapter 7, "Prescribe Commands for MPS Management," or Chapter 9, "Virtual Mail Box (VMB) Specifications."

JOBS — JOB Start

This command is an MPS command and a VMB command.

Function

MPS : The job starts when this command is encountered.
VMB : Starts stacking jobs on a VMB virtual tray.

For a detailed explanation of this command, refer to Chapter 7, "Prescribe Commands for MPS Management," or Chapter 9, "Virtual Mail Box (VMB) Specifications."

JOBT — JOB Terminate

This command is an MPS command and a VMB command.

Function

MPS: Terminates a job.
VMB: Terminates a VMB job.

For a detailed explanation of this command, refer to Chapter 7, "Prescribe Commands for MPS Management," or Chapter 9, "Virtual Mail Box (VMB) Specifications."

JOG — JOG output stack for separation

Format

```
JOG;
```

Parameter

None

Function

It is possible to offset separate jobs in the output stack by explicitly repeating this command so that each separate user can clearly distinguish his/her print jobs from the others. The jogger unit in the optional stacker jogs jobs on demand when the JOG command is received. This command can therefore be used to tell the jogger of the optional stacker to jog just the first page of a job or to jog all output pages of the job to the left or right.

A jog specification is enabled until the next JOG command is received. This is unaffected even by the reception of a command such as RES, FRPO and SEM which results in a reset of the printer. The jogger does not operate without explicit use of the JOG command.

This command is only enabled when an optional stacker (ST-30 or DF-30/31) is attached. It is also necessary that the stack selection for the optional stacker be set to `STAK 2;` (face-up) or `STAK 3;`(face-down).

Jog control for each optional stacker differs as follows:

Command	ST-30 operation	DF-30/31 operation
JOG;	Jogs first page only	Jogs all pages, to the other side of the current stack

Since this command shares control internally with the JOB OFFSET command supported by PJL, be sure to avoid mixing the JOG command and PJL's OFFSET.

Note: **For an explanation of MPS, refer to Chapter 7, "Prescribe Commands for MPS Management."**

LDFC — LoaD Font Character

Format

LDFC *font-number*, *code*, *height*, *width*, *y-offset*, *x-offset*, *cell-width*, *center*, *rotation*[, *resolution*]; *bit-map*;

Parameters

font:
font number (integer from 1000 to 65535). Same for all characters in the font. Must not duplicate any resident bitmap font number.

code:
ASCII code of the character (0 to 255)

height:
height of the character bitmap, in dots (integer from 0 to 3999)

width:
width of the character bitmap, in dots (integer from 0 to 3999)

y-offset:
distance from the baseline to the top of the character bitmap, in micro dots [$^{1}/_{32}$ dot] (integer from -32768 to 32767); positive – up, negative – down

x-offset:
distance from the left edge of the character cell to the left edge of the character bitmap, in micro dots [$^{1}/_{32}$ dot] (integer from -32768 to 32767); positive – up, negative – down

cell-width:
total width of the character cell, in micro dots [$^{1}/_{32}$ dot] (integer from 0 to 65535). This parameter is used in proportional spacing.

center:
distance from the left edge of the character cell to center of the character, in micro dots [$^{1}/_{32}$ dot] (integer from 0 to 65535)

rotation:

0=portrait
1=upside-down landscape
2=upside-down portrait
3=landscape

resolution:

resolution of the character, 300 [dpi], 600 [dpi], or 1200 [dpi]

bit map:

dot pattern of the character, coded as a character string

Function

The LDFC command defines one character of a new bitmap font. It can be used to create special characters such as the one shown below, which is defined as the '+' symbol (character code 43) of font 1000. Details and another example appear in *Chapter 3*.

The *resolution* is valid only on a 600/1200 dpi printer model.

File

```
!R!
LDFC 1000, 43, 39, 29, 1216, 0, 1216, 608, 0;
@@2@@0@@2@@0@@2@@0@@2@@0@@7@@0@@7@@0@@7@@0@@?'@0
@@?'@0@A?p@0@A?p@0@C?x@0@G?|@0@O?~@0@_?/@0@/?/'0
A/?/p0G/?/x0O/?/~0//?//8O/?/~0G/?/x0A/?/p0@/?/'0
@_?/@0@O?~@0@G?|@0@C?x@0@A?p@0@A?p@0@@?'@0@@?'@0
@@7@@0@@7@@0@@7@@0@@2@@0@@2@@0@@2@@0@@2@@0;

FONT 1000; SLM 1; SCPI 6; SLPI 6;
TEXT '+ + + + + + + + + + + + +', N;
TEXT ' + + + + + + + + + + + + ', N;
TEXT '+ + + + + + + + + + + + +', N;
TEXT ' + + + + + + + + + + + + ', N;
TEXT '+ + + + + + + + + + + + +', N;
EXIT;
```

Printout

LDFN C — generate bitmap character for LoaDing FoNt

Format

LDFN C, *#1*, *#2*, *#3*, *#4*, *#5*, *#6*, *#7*; *<bitmap data>*;

Parameters

#1:
font number: 1000 to 65535

#2:
character code: 0 to 255 = European code; 0 to 65533 = Japanese code; or in hexadecimal notation ($xxxx)

#3:
bitmap height (in dots, 1/300″ or 1/600″): 1 to 65535

#4:
bitmap width (in dots): 1 to 65535

#5:
bitmap Y offset (in 1/32 dots): -32768 to 32767

#6:
bitmap X offset (in 1/32 dots): -32768 to 32767

#7:
character width (in 1/32 dots): 1 to 65535

<bitmap data>:
bitmap transfer data (BBN format)

Function

The LDFN C command defines bitmap characters for each character code for the downloaded font header already defined using LDFN F. Note that each character code defined must match the font number, symbol set (1- or 2-byte code), and other information of the font header already created. The bitmap data transferred at the end of this command is transferred under Kyocera's original BBN format. This is the transfer format used by the LDFC and LDKC commands.

This command is recommended for use with downloading bitmap fonts. In other words, this command is intended as an equivalent for the old LDFC and LDKC commands. Use this command when creating a new bitmap font. LDFC, LDKC and CRKF will be deleted in the future.

Units used in parameters #3 through #7 are dots of the resolution defined in the font header.

The coordinate system used when defining bitmap fonts with this command is defined as follows. Note the sign of the offset value.

Font Registration Coordinate System

A command error will result and the command has no effect if any of the parameters are outside the given range. This command is ignored if even one parameter error occurs.

LDFN F — create header for LoaDing FoNt

Format

```
LDFN F, #1, #2, #3, #4, #5, #6, #7, #8, #9, #10,
#11;
```

Parameters

#1:

font number: 1000 to 65535

#2:

resolution:
0 = 300-dpi bitmap
1 = 600-dpi bitmap
3 = 1200-dpi bitmap (Fine mode)

#3:

font name (ASCII text string up to 31 characters long). This string must be enclosed in either single or double quotation marks.

#4:

symbol set:
numeric value = 1-byte code symbol set (1 to 65535 [619: Shift JIS code])
J = 2-byte JIS code

#5:

spacing:
0 = fixed spacing
1 = proportional spacing

#6:

font width (in dots set by #2): 3 to 3000

#7:

font height (in dots set by #2): 4 to 4165

#8:

font style: 0 to 32767

#9:

stroke weight: -127 to +127

#10:

type face: 0 to 32767

#11:

font type:
0 = character codes from 32 to 127
1 = character codes from 32 to 127 and from 160 to 255
2 = character codes from 0 to 255

Function

The LDFN F command creates a font header for downloading a font to the printer. After the header is created, you must continue with downloading bitmap characters using the LDFN C command. This command only generates a font information header; it includes no character definition information. Since the font header defined by this command is capable of registering extensions to ANK codes (a 1-byte code), it is necessary to select a font after assigning fonts using the ASFN command when using 2-byte characters. Refer to the ASFN command page for details.

Currently, this command is recommended for use with downloading bitmap fonts. In other words, this command is intended as an equivalent for the old LDFC, LDKC and CRKF commands to create a new bitmap font. LDFC, LDKC and CRKF will be deleted in the future.

Font Select Command	Description
FONT, SFNT	European character (1-byte code) emulation
KFNT, SKFT	Japanese character (2-byte code) emulation (linked using ASFN)

A command error will result and the command has no effect if any of the parameters are outside the given range. This command is ignored if even one parameter error occurs.

LDFN S — LoaD truetype FoNt

Format

```
LDFN S, #1, #2, #3, #4[, #5, #6, #7, #8];
<binary data> WRED;
```

Parameters

#1:

font format:
0 = TrueType font
1 = Japanese TrueType font
2 = Japanese TrueType Collection font

#2:

font number: 1000 to 65535
Since there are two font headers for Japanese TrueType fonts, the printer automatically creates a font number incremented by 1.

#3:

font name: ASCII text string of up to 31 characters long. This string must be enclosed in either single or double quotation marks.

#4:

font data length: number of bytes sent as *<binary data>*

#5:

font symbol set value: 1 to 65535 (619 = Shift JIS code)

#6:

font style: 0 to 32767

#7:

stroke weight: -127 to +127

#8:

type face: 0 to 32767

<binary data>:

font data (in TrueType format)

Function

The LDFN S command allows outline fonts (TrueType fonts) to be downloaded to the printer. A binary format is used to represent font data. The size of this data must match that given by parameter #4 (font data length).

Always explicitly terminate font data using `WRED;`. The five bytes represented by `WRED;` are not counted as part of the font data length.

The maximum number of fonts that can be downloaded is up to the memory available or 256 fonts (512 when parameter *#1* is 2). Use FONT or SFNT command to select 1-byte fonts to be defined with this command.

TrueType fonts defined using this command cannot be completely deleted unless both DELF n; and DELF n+1; are specified.

A command error will result and the command has no effect if any of the parameters are outside the given range. This command is ignored if even one parameter error occurs.

Although parameters *#5* through *#8* may be omitted, we recommend that parameters up through *#8* be used to define font selection information.

MAP — Move to Absolute Position

Format

MAP *x-coordinate*, *y-coordinate*;

Parameters

x-coordinate:
distance from the left margin

y-coordinate:
distance from the top margin

Function

The MAP command moves the cursor to a position specified relative to the top and left margins, measured in the units designated by the UNIT command. The coordinates may be positive or negative. Negative coordinates move the cursor outside the margin.

The MAP command is ignored in path mode graphics.

Related Command

MRP, MZP, MRPA

File

```
!R! RES; UNIT C; STM 2; SLM 2;
SFNT "Swiss742SWC-RomanCondensed", 9;
MAP 0, 0; BOX 40, 40; SPD .2;
MAP 0, 1.4; TEXT '<===Margins';
MAP 0, 0; CIR .1; TEXT, L; TEXT ' MAP 0, 0;';
MAP 4, 0; CIR .1; TEXT, L; TEXT ' MAP 4, 0;';
MAP 0, 2; CIR .1; TEXT, L; TEXT ' MAP 0, 2;';
MAP 4, 2; CIR .1; TEXT, L; TEXT ' MAP 4, 2;';
MAP -1, -1; CIR .1; TEXT, L; TEXT ' MAP -1, -1;';
PAGE;
EXIT;
```

Printout

MCRO — define MaCRO

Format

MCRO *name*[*dummy sign*[, *comment*]];

Parameters

name:
character string starting with a letter

dummy sign:
any character (default: % preceded by a space)

comment:
any character string

Function

The MCRO command assigns a name to the sequence of Prescribe commands that follows, up to the ENDM (end macro) command. Thereafter, the entire sequence of commands can be executed by specifying the assigned name in a single CALL or AMCR (automatic macro) command.

The *name* can be any length but only the first four characters count. The rest will be ignored. The distinction between upper and lowercase letters is also ignored. For example, the following macro names are all the same:

```
ABCD
abcd
ABCDE
Abcdxyz
```

The name must start with a letter, but the other characters can include digits and special symbols such as hyphens. For example, F-1 and GRY2 are valid macro names.

The *dummy sign* (normally the percent sign) indicates dummy parameters in the body of the macro. Dummy parameters are given by writing the dummy sign followed by a number: %1 for the first dummy parameter, %2 for the second dummy parameter, and so on, up to a maximum of 19 dummy parameters. The same dummy parameter can be used any number of times. Values are assigned to dummy parameters when the macro is invoked by the CALL command.

If a macro with the same name has already been defined, the new definition is ignored. To redefine a macro, you must first delete the old definition with the DELM (delete macro) or DAM (delete all macros) command, or by switching power off.

See page 1-81 for information on the limitations about the usage of macros.

The PCL5E command language, available in the mode 6 emulation, enables users to record HPGL/2 macros inside of HPGL/2 commands.

Note **Models that support HP LaserJet III emulation do not support this feature.**

Another feature introduction of the printers effects use of PCL macros. For the first time, these macros can be accessed from an external memory source: EPROM or memory cards. This differs from the FS-400/FS-1550/FS-3400 where PCL macros were required to be downloaded to the printer. This external memory support is a function of PCL5E. Support continues for downloading PCL macros to printer memory. To alleviate limitations of internal memory, PCL macros can be stored on the external memory source.

The following table shows the source of the PCL macros, the location in the printer, and the property value for the resource — important if resource protection mode is used. See also *Resource Protection* in section 6.7.

Macro	Location	Property
Downloaded	RAM	Temporary/Permanent
Memory card	Memory card	Permanent
Internal	EPROM	Permanent

The internal printer firmware manages the PCL macros, recognizing the source, location and property value of the macros.

If the printer encounters PCL macros with the same macro ID, it will prioritize them in the following order: macros downloaded to RAM, macros residing on a memory card, and macros stored in the EPROM.

Memory card and EPROM based PCL macros cannot be deleted. Downloaded PCL macros, available for all FS-series printers, may be removed using the PCL reset or delete commands: `<ESC>&f6X` or `<ESC>&f8X`. Downloaded macros may also be sent to specific host buffers of the printer interfaces. The memory card and EPROM macros will be available on all interfaces.

File

```
!R! RES; FSET 1p12v0s3b4158T;
MCRO SIGN %, string, length + 0.3;
SPD .03;
BOX %2, .3; MRP .15, .2;
TEXT %1; MRP -.15, .35;
ENDM;
CALL SIGN, 'CHECK ALL SWITCHES AND INDICATORS ...', 3.9;
CALL SIGN, 'BE SAFE; NOT SORRY', 2.1;
PAGE;
EXIT;
```

Printout

MDAT — set MeDia type ATtribute

Format

```
MDAT [#1[, #2, #3, #4]];
```

Parameters

#1 Media type

1 = Plain
2 = Transparency
3 = Preprinted
4 = Label
5 = Bond
6 = Recycled
7 = Vellum
8 = Rough
9 = Letterhead
10 = Color
11 = Prepunched
12 = Envelope
13 = Cardstock
21 = Custom 1
22 = Custom 2
23 = Custom 3
24 = Custom 4
25 = Custom 5
26 = Custom 6
27 = Custom 7
28 = Custom 8

#2 Paper weight

0 = Normal
1 = Heavy (Thick)
2 = Light (Thin)

#3 Fuser Mode

0 = High
1 = Middle
2 = Low
3 = Vellum

#4 Duplex path

0 = Enable
1 = Disable

Function

The MDAT command is used to customize the default attributes of a media type for optimization. The paper weight attribute affects the printer's transfer bias, the fuser mode affects the fuser temperature, and the duplex path determines whether the paper with that paper type is allowed for duplex printing or not.

If the parameters 2 and 3 are omitted, this command resets the three attributes back to their defaults. If all the parameter are omitted (MDAT;), all the attributes for the all media types are reset to the default.

Refer to printer's User's Manual for details on media type.

Note

This command is valid only for printers that support the media type selection, such as the FS-7000.

Related Command

MTYP

File

To set the Transparency paper type to the Thick paper weight and the High fuser mode, disabling the duplex printing, command:

```
!R! MDAT 2, 1, 0, 1; EXIT;
```

MID — Multi-tray ID

Format

`MID` *tray-group-ID*`;`

Parameters

tray-group-ID:
number representing the sorter tray group

Function

The MID command is effective only when the option sorter is installed to the printer. It selects the tray group in the identification-specific mode of multiple environment and delivers the printed pages into the tray group represented by the *tray-group-ID* as follows (default):

Group selection command	Trays	
	SO-6	SO-30
MID 1;	1 to 5	1
MID 2;	6 to 10	2
MID 3;	11 to 15	3
MID 4;	—	4
MID 5;		5
MID 6;		6
MID 7;		7
MID 8;		8
MID 9;		9

Once the destination tray group is assigned using the MID command, the subsequent SSTK (select Sorter STacKer) or CSTK (select Collator STacKer) command places the output pages into the trays of that group for sorting or collating, counting the top tray in the group as the first tray.

The MID command should be placed at the beginning of a file or program, or at the top of a new page. The selection of a tray group made by the MID command is effective until it is changed by another MID command (It is not reset by the RES command).

If the printer receives an ASTK command or one of the FRPO commands, the MID command is canceled (the output pages will be sorted in the normal sorter mode) and you must reselect the tray group by specifying the MID command.

Related Commands

ASTK, CSTK, MSTK, SSTK

To enable the multiple user mode (FRPO S0, 1;), to create three groups, to select the second group, and to deliver outputs in the fourth tray in the (second) group, send the following command sequence:

The MID command is ignored while the multiple environment mode is interface-specific (FRPO S0, 2;) or off (FRPO S0, 0;). Refer to the sorter's *User's Manual*.

File

```
!R! FRPO S0, 1; ASTK 2, 5; MID 2; SSTK 2; EXIT;
This page must be delivered to the 4th tray in the
sorter.
!R! RES; EXIT;
```

Printout

Omitted

MLST — print MacroLiST

Format

```
MLST;
```

Parameter

None

Function

The MLST command prints a list of all macros stored in different memory locations for reference. The printout includes the following information:

Macro status page sample

```
                    PRINTER  MACRO  STATUS  PAGE

Location: RAM

          Type    Macro ID        I/F     Attr./Auto      Size (Byte)
          ------------------------------------------------------------
          PRE         FW0         PAR     Permanent            26
          PRE         FW          PAR     Permanent           238
          PRE         LIN2        PAR     Permanent            28

Location: EPROM

          Type    Macro ID        I/F     Attr./Auto      Size (Byte)
          ------------------------------------------------------------
          PCL          123                Permanent           296
          PRE         VLIN                Permanent            28
          PRE         FORM                Permanent            83
          PRE         HLIN                Permanent            28
```

Location: RAM/EPROM/IC-CARD

Macros are listed depending on the location where they are stored. The macros downloaded from the computer to the printer's user memory are listed under `Location: RAM`. The macros permanently contained within an EPROM or IC card will appear under `Location EPROM:` or `Location: IC-CARD`, respectively.

Type

Identifies whether the macro was generated by Prescribe MCRO command (PRE) or HP PCL command (PCL).

Macro ID

The name given to the macro when it was created.

I/F

The interface on which the macro is available. The macros present in the printer's user memory (Location: RAM) were downloaded through a specific interface and available on that interface only. Macros provided on an EPROM or IC card are shared among all available interfaces.

Attr./Auto

The attribute of the macro specifies whether it is permanent or temporary. Note that the automatic macro (macro overlay) is indicated by a /E (means *enabled*) following the attribute.

Size

The size of the macro in bytes.

MRP — Move to Relative Position

Format

`MRP` *x-coordinate*, *y-coordinate*;

Parameter

x-coordinate/y-coordinate:
Coordinates as measured from the current cursor position.

Function

The MRP command moves the cursor from its current position to a specified relative position, measured in the units designated by the UNIT command. The coordinates may be positive or negative.

The MRP command works in the standard mode graphics only. To move to a relative position in a path construction, use the PMRP (in Path, Move to Relative Position) command.

Related Commands

MAP, MZP, MRPA

File

```
!R! RES; UNIT C;
SFNT ”Swiss742SWC-Bold”;
CMNT MRP and baseball;
MRP 8, 8; CIR .2;
TEXT ’ 1st’;
MRP -2, -2; CIR .2;
TEXT ’ 2nd’;
MRP -2, 2; CIR .2;
TEXT ’ 3rd’;
MRP 2, 2; CIR .2;
TEXT ’ Home’;
PAGE;
EXIT;
```

Printout

MRPA — Move to Relative Position specified by Angle

Format

`MRPA` *distance*, *angle*;

Parameter

distance:
distance to move

angle:
angle in degree, measured clockwise from the vertical

Function

The MRPA command moves the cursor from its current position across a specified distance using a specified angle. The distance is measured in the units designated by the UNIT command.

The MRPA command is ignored in the path mode graphics. To move to a relative position specifying angle in a path construction, use the PMRA (in Path, Move to Relative position by Angle) command.

Related Commands

MAP, MRP, MZP

File

```
!R! RES; UNIT C;
CMNT Numbers indicate cursor movement;
SFNT ”Swiss742SWC-Bold”;
MAP  6,  12; CIR 1; TEXT ’1’;
MRPA 2,  60; CIR 1; TEXT ’2’;
MRPA 2, 120; CIR 1; TEXT ’3’;
MRPA 2, 180; CIR 1; TEXT ’4’;
MRPA 2, 240; CIR 1; TEXT ’5’;
MRPA 2, 300; CIR 1; TEXT ’6’;
PAGE;
EXIT;
```

Printout

MSTK — select Mail-box STacKer

Format

`MSTK [`*tray*`, `*tray*`, ...]; or MSTK 0;`

Parameters

tray:
number from 1 to the maximum

Function

The MSTK command is valid only when the option sorter is installed for the printer. It instructs the printer to deliver printed pages in the mail box mode. In the mail box mode, the printed pages are delivered to the trays in the reverse order of tray parameters. The printed pages are delivered first to the last specified tray until it becomes full; when the last specified tray becomes full, then the pages are delivered to the second to the last specified tray, and so on until the first specified tray becomes full. When the first specified tray becomes full, the bulk tray receives the overflowed pages until it also becomes full.

When the bulk tray becomes full, the printer pauses and displays a `Sorter paper full/Option tray # paper full (#: tray number)` message. You will need to remove all the pages in the bulk tray and press the ON LINE key to restart printing.

If the tray parameters are omitted, all trays excluding the bulk tray are used.

Upon receiving the MSTK command, the printer automatically performs a page feed.

The MSTK 0; command is applicable only for the SO-6. This command cancels the mail box mode and delivers all pages in the bulk output tray.

File

```
!R! RES; MSTK; COPY; EXIT;
PAGE 1 (2 copies, bottom tray) !R! PAGE; EXIT;
PAGE 2 (2 copies, bottom tray) !R! PAGE; EXIT;
```

Printout

Omitted

MTYP — select Media TYPe

Format

`MTYP` *media type;*

Parameters

Media type

1 = Plain
2 = Transparency
3 = Preprinted
4 = Label
5 = Bond
6 = Recycled
7 = Vellum
8 = Rough
9 = Letterhead
10 = Color
11 = Prepunched
12 = Envelope
13 = Cardstock
21 = Custom 1
22 = Custom 2
23 = Custom 3
24 = Custom 4
25 = Custom 5
26 = Custom 6
27 = Custom 7
28 = Custom 8

Function

The MTYP command automatically selects the paper source (tray or cassette) depending on the current paper type. When the MTYP command is issued, the printer looks for the paper source which has the matching paper type assigned by the MTYP command. To assign a paper type to the paper cassette, use the printer's control panel or one of the FRPO X0 – X7 commands.

Note

For the MTYP command to work, the automatic cassette switching mode must be set to on. To do this, command: `!R! PSRC 100; EXIT;` (automatic cassette switching depending on paper type). For details see the PSRC (set paper source) command section in this manual.

The MTYP command does not automatically selects the paper source but to specifies the media type for the current print job. Therefore, to ensure that the paper having the correct paper size and paper type is always selected, we recommend to place an SPSZ (set page size) command sequence following the MTYP command sequence. For example, to automatically print on the plain A4 paper you put in the cassette one (topmost cassette), first assign the plain paper type to the cassette 1 by FRPO X1, 1;, then command MTYP 1; SPSZ 8;.

Note

This command is valid only for printers that support the auto media type selection function. (Confirm that the command is valid in the User's Manual for the printer.)

Related Commands

PSRC, SPSZ

File

To print on the A4 label loaded on the printer's MP tray:
First, set the MP tray size to A4 and the MP tray type to Labels (See the printer's user's manual for details.)

```
!R! RES;
PSRC 100;
     CMNT Sets the printer to automatic cassete
     mode;
     CMNT Depending on the current media type;
SPSZ 8; MTYP 4;
     CMNT Paper size = A4, media type = label;
RES; EXIT;
```

Printout

Omitted

MZP — Move to Zero-relative Position

Format

`MZP` *x-coordinate*, *y-coordinate*;

Parameters

x-coordinate:
distance from the left edge limit of paper

y-coordinate:
distance from the top edge limit of paper

Function

The MZP command moves the cursor to a position specified relative to the top and left edge limits of the paper, measured in the units designated by the UNIT command. The coordinates may be positive or negative. Negative coordinates, however, move the cursor off the page, which should be avoided.

The MZP command is ignored in the path mode graphics. To move to a zero-relative position in a path construction, use the PMZP (in Path, Move to Zero-relative Position) command.

Related Commands

MAP, MRP, MRPA

File

```
!R! RES; UNIT C; STM 2; SLM 2;
SFNT ”Swiss742SWC-RomanCondensed”;
MZP 0, 0; BOX 40, 40; SPD .2;
MZP 0, 4; TEXT ’<===Edge limits’;
MZP 0, 0; CIR .1; TEXT, L; TEXT ’ MZP 0, 0;’;
MZP 6, 0; CIR .1; TEXT, L; TEXT ’ MZP 6, 0;’;
MZP 0, 2; CIR .1; TEXT, L; TEXT ’ MZP 0, 2;’;
MZP 6, 2; CIR .1; TEXT, L; TEXT ’ MZP 6, 2;’;
PAGE;
EXIT;
```

Printout

NEWP — start NEW Path

Format

```
NEWP;
```

Parameter

None

Function

The NEWP command empties the current path and starts a new path. A path construction ends with the CLSP (CLoSe Path) command or with any painting operator that paints the path or draws a line along it (STRK, FILL).

For a full description of path, refer to *Chapter 1*.

Related Command

CLSP, FILL, STRK

File

```
!R! RES; UNIT C;

NEWP;
PMZP 5, 5;
PDRP 1, -2, 3, 0, -1, 2, -3, 0;
STRK; CMNT Stroking the path;

NEWP;
PMZP 10, 5;
PDRP 1, -2, 3, 0, -1, 2, -3, 0;
GPAT .5; FILL 1; CMNT Filling the path;

PAGE; EXIT;
```

Printout

PAGE — start new PAGE

Format

```
PAGE;
```

Parameter

None

Function

The PAGE command causes a page break without resetting the printer. Subsequent data will be printed on a new page with no changes made to page formatting parameters such as spacing, margins, font selection.

If there is no printing on the current page, the PAGE command will have no effect. It does not feed out a blank page.

File

```
!R! RES;
SLM 1; STM 1;
EXIT;
Page 1:
Following this line, a page break will occur.
!R! PAGE; EXIT;
Page 2:
```

Printout

Omitted

PARC — in Path, draw ARC

Format

PARC *x-coordinate*, *y-coordinate*, *radius*, *start-angle*, *end-angle*;

Parameters

x-coordinate, y-coordinate:
coordinates of the center of arc, measured from the left and top edge limits

radius:
radius of arc

start-angle:
starting angle, measured counterclockwise from the positive x axis

end-angle:
ending angle, measured counterclockwise from the positive x axis

Function

This command first of all adds a line extending from the current position to the beginning of the arc, then adds an arc to the current path. Coordinates and radius are measured in the units designated by the UNIT command; the starting and ending angles are measured counterclockwise from the positive *x* axis.

To draw a simple arc as specified by the parameters, the cursor must be moved to the beginning of the arc by using the PMRA command. (See the example on next page.)

The arc is drawn at the starting angle through the ending angle in counterclockwise direction only. After the path is stroked, the cursor remains at the ending angle of the arc.

File

```
!R! RES; UNIT C;
NEWP; SPD .1;
PMZP 5.0, 10.0;
PARC 6.5, 12.5, 1.5, 180, 270;
STRK;

NEWP;
CMNT This program draws a circle;
PMRA 6.5, 18, 1.5, 0;
CMNT Moves cursor 1.5 cm by 0 degree;
PARC 6.5, 18, 1.5, 0, 360;
STRK;
PAGE; EXIT;
```

Printout

PAT — select fill PATtern

Format

PAT *pattern-number*[, *resolution*];

Parameters

pattern-number:
number from 1 to 60 or 100 to 105

resolution:
300 [dpi], 600 [dpi], or 1200 [dpi]

Function

The PAT command specifies the shading pattern used by the BLK and ARC commands and to fill a path.

The *pattern-number* should be any number between 1 through 60 if a resident pattern is selected. A full list of the printer's resident patterns appear on the following page.

Pattern numbers 100 through 105 are reserved for selecting the expanded patterns and can be generated by using the XPAT command. If you specify a pattern number between 100 and 105 when no expanded patterns are defined, the printer selects the No. 1 (solid black) resident pattern.

Variable resolution support is valid for 600 dpi and 1200 dpi models only.

Resident Fill Patterns (300 dpi)

PCRP — in Path, Curve to Relative Position

Format

PCRP *x1*, *y1*, *x2*, *y2*, *x3*, *y3*;

Parameters

x1, y1:
coordinates of the first control point as measured from the current cursor position

x2, y2:
coordinates of the second control point as measured from the current cursor position

x3, y3:
coordinates of the end point as measured from the current cursor position

Function

The PCRP command adds a Bézier curve segment to the path, starting from the current cursor point, referred to as current position as shown at right, through two control points of (*x1*, *y1*) and (*x2*, *y2*), and ending at (*x3*, *y3*).

Example:

```
NEWP;
PMZP 5, 10;
PCRP 2.5, -4, 7, -5, 7, 0;
STRK;
```

File

```
!R! RES; UNIT C;
NEWP;
SPD .1;
PMZP 3, 3;
PCRP 4, 2, 5, 1.5, 6, 1.8;
STRK;
PAGE;
EXIT;
```

Printout

File

```
!R! RES; UNIT C;
NEWP;
SPD .1;
PMZP 3, 3;
PCRP 5.5, 1.5, 1.5, 5.5, 7, 7;
STRK;
PAGE;
EXIT;
```

Printout

PCZP — in Path, Curve to Zero-relative Position

Format

PCZP *x1*, *y1*, *x2*, *y2*, *x3*, *y3*;

Parameters

x1, *y1*:
coordinates of the first control point as measured from the left and top edge limits of paper

x2, *y2*:
coordinates of second control point as measured from the left and top edge limits of paper

x3, *y3*:
coordinates of end point as measured from the left and top edge limits of paper

Function

The PCZP command adds a Bézier curve segment to the path, starting from the current cursor position through two controls points of (*x1*, *y1*) and (*x2*, *y2*), and ending at (*x3*, *y3*), measured from the left and top edge limits of the paper.

Example:

```
NEWP;
PMZP 1.5, 3.5;
PCZP 4.5, 1.5, 5.5, 5.5, 8, 3.5;
STRK;
```

File

```
!R! RES; UNIT C;
PMZP 3, 6;
PCZP 11, 3, 2, 2, 9, 6;
STRK;
PAGE;
EXIT;
```

Printout

PDIR — set Print DIRection

Format

PDIR *angle*;

Parameter

angle:

angle in degrees; in 90° increments in a counterclockwise direction

0=portrait
90=landscape
180=reverse portrait
270=reverse landscape

Function

The PDIR command rotates the coordinates of the logical page by the degree represented by the value of the *angle* which orients the page in one of four directions. It does not change the current page orientation.

When the print direction is changed by the PDIR command, the logical page coordinate system is transformed so the margins maintain the same printable area (the area enclosed by the margins) as shown on next page. The current position uses the same coordinate values as the previous print direction; line-spacing, and the character-spacing of the current font are effected by the new print direction as are the raster and pattern graphics.

Scalable fonts should be used for printed text in different page directions. The PDIR command rotates only the coordinates of the logical page on the current page orientation and does not affect the current page orientation. A bitmap font prints text according to the current page orientation (it adheres to the current font mode).

The PDIR command does not cause a page break, so you can print text in four different directions on the same page as shown in the sample file on the next page.

Portrait (PDIR 0;)

Landscape (PDIR 90;)

Reverse Landscape (PDIR 270;)

Reverse Portrait (PDIR 180;)

File

```
!R! RES;
UNIT P; SFNT 'Swiss742SWC-Roman', 8;
UNIT C; MZP 10, 12; SPD .144; CIR .075;

PDIR 270; TEXT ' ENDLESS VARIETY AND VERSATILITY';
PDIR 180; TEXT ' ENDLESS VARIETY AND VERSATILITY';
PDIR  90; TEXT ' ENDLESS VARIETY AND VERSATILITY';
PDIR   0; TEXT ' ENDLESS VARIETY AND VERSATILITY';

PAGE;
EXIT;
```

Printout

PDRP — in Path, Draw to Relative Position

Format

PDRP *x-coordinate*, *y-coordinate*, ...;

Parameters

x-coordinate, *y-coordinate:*
coordinates as measured from the current cursor position

Function

The PDRP command adds a line to the current path from the current cursor position to a specified relative position, measured in the units designated by the UNIT command. The cursor moves to the specified coordinates. The coordinates may be positive or negative. Negative coordinates may draw the line extending outside the current page. The thickness of the line is designated by the SPD command.

Multiple pairs of coordinates may be specified. The printer then draws a connected series of line segments, proceeding from one point to the next. For example, PDRP 1, 2, 3, 4; is equivalent to PDRP 1, 2; PDRP 3, 4;.

Related Commands

PDZP

File

```
!R! UNIT C; SPD .3;
CMNT Cube;

NEWP;

PMZP  5,  15;
PDRP  4,   0,  2, -2,
      0,  -4, -4,  0,
     -2,   2,  0,  4;
CLSP;
PMRP  4,   0;
PDRP  0,  -4, -4,  0,
      4,   0,  2, -2;
STRK;

PAGE; EXIT;
```

Printout

PDZP — in Path, Draw to Zero-relative Position

Format

PDZP *x-coordinate*, *y-coordinate*;

Parameters

x-coordinate, y-coordinate:
coordinates as measured from the left and top edge limits of the current page

Function

The PDZP command adds a line to the current path from the current cursor position to a position specified relative to the top and left edge limits of the current page, measured in the units designated by the UNIT command. The cursor moves to the specified coordinates.

The coordinates may be positive or negative. Negative coordinates may draw the line extending outside the current page. The thickness of the line is designated by the SPD command.

Related Commands

PDRP

File

```
!R! RES; UNIT C;
NEWP;
        PMZP 0, 0; PDZP 0, 5;
        PMZP 1, 0; PDZP 0, 4;
        PMZP 2, 0; PDZP 0, 3;
        PMZP 3, 0; PDZP 0, 2;
        PMZP 4, 0; PDZP 0, 1;
        PMZP 5, 0; PDZP 0, 0;
STRK;
PAGE;
EXIT;
```

Printout

PELP — in Path, draw ELlipse

Format

```
PELP #1, #2 [, #3, #4, #5, #6 [, #7] ] ;
```

Parameters

#1:
X-coordinate of diagonal point of bounding box

#2:
Y-coordinate of diagonal point of bounding box

#3:
X-coordinate of start control point of the ellipse

#4:
Y-coordinate of start control point of the ellipse

#5:
X-coordinate of end control point of the ellipse

#6:
Y-coordinate of end control point of the ellipse

#7:
ellipse options:
N = define an ellipse path
C = define an ellipse-based arc path
P = define an ellipse-based pie shape path

Function

The PELP command adds an ellipse-based path to the current path. This command cannot paint figures by itself. In addition, STRK or FILL is required. A complete ellipse path will be defined if parameter #3 and on are omitted. Executing this command will close current sub-paths.

An error will result and the command has no effect if the bounding box is specified as a straight line or a point.

Current cursor position
(#3, #4)
(#5, #6)
Bounding box
(#1, #2)
N :
C :
P :

File

```
!R!
res;
unit c;

mzp0,0;
box2,3;
newp;
pmzp0,0;
pelp2,3,2,0,0,0,n;
strk;

mzp5,5;
box2,-3;
newp;
pmzp5,5;
pelp2,-3,2,0,0,0,n;
strk;

mzp10,5;
box-2,-3;
newp;
pmzp10,5;
pelp-2,-3,-2,0,0,0,n;
strk;

mzp15,0;
box-2,3;
newp;
pmzp15,0;
pelp-2,3,-2,0,0,0,n;
strk;

res;
exit;
```

PIE — draw PIE chart

Format

`PIE` *radius*, *starting angle*, *size of slice*, ...;

Parameters

radius:
radius of the pie chart

starting angle:
position of the first slice

sizes of slices:
relative sizes of the slices

Function

The PIE command is a standard mode graphics command which draws a pie chart centered at the current cursor position. The sizes of the slices may be specified using any convenient non-negative integers. (PIE commands are ignored if they contain negative slices, or slices with decimal fractions.) The sum of the slice sizes should not exceed 9999. The total length of the command must not exceed 255 characters.

The printer automatically converts the slice sizes to angles totaling 360 degrees. It draws the first slice starting at the position specified by the second parameter (0=vertically up), then draws the other slices in order, proceeding in a clockwise movement. The line thickness is designated by the SPD command.

File

```
!R! RES; UNIT C;
MZP 10, 10;
PIE 3, 0, 10, 20, 30, 40;
PAGE;
EXIT;
```

Printout

PMRA — in Path, Move to Relative position specified by Angle

Format

PMRA *x-coordinate*, *y-coordinate*, *distance*, *angle*;

Parameters

x-coordinate, y-coordinate:
Coordinates as measured from the left and top edge limits of the page

distance:
distance specified in increments governed by the unit value.

angle:
angle in degrees, measured counterclockwise from the positive *x* axis

Function

The PMRA command moves the cursor to a position in a path construction, specified relative to the left and top edge limits of the page, then across a distance specified relative to the x- and y-coordinate and at a specified angle.

It should be noted that the x and y coordinates are measured from the top and left edge limits of the page, and not from the current cursor position.

The coordinates and distance are measured in the units designated by the UNIT command. The angle is measured counterclockwise from the positive x axis.

File

```
!R! RES; UNIT C; SPD 0.2;

NEWP;
PMRA 10, 19, 5, 45;
PARC 10, 19, 5, 45, 135;
STRK;

PAGE; EXIT;
```

Printout

PMRP — in Path, Move to Relative Position

Format

PMRP *x-coordinate*, *y-coordinate*;

Parameters

x-coordinate, *y-coordinate*:
Coordinates as measured from the current cursor position.

Function

The PMRP command moves the cursor from its current position to a specified relative position in a path construction, measured in the unit value designated by the UNIT command.

The coordinates may be positive or negative.

Related Commands

PMZP

File

```
!R! RES; UNIT C;
NEWP;
PMZP 5, 5;
PDRP 5, 0, 0, 5, -5, 0, 0, -5; GPAT .2; FILL 1;
PMRP 4, 4;
PDRP 5, 0, 0, 5, -5, 0, 0, -5; GPAT .8; FILL 1;
PAGE;
EXIT;
```

Printout

PMZP — in Path, Move to Zero-relative Position

Format

`PMZP` *x-coordinate*, *y-coordinate*;

Parameters

x-coordinate, y-coordinate:
Coordinates as measured from left edge limit of the current page

Function

The PMZP command moves the cursor to a position in a path construction, specified relative to the top and left edge limits of the current page, and measured in the units designated by the UNIT command.

The coordinates may be positive or negative. Negative coordinates move the cursor off the current page.

Related Commands

PMRP

File

```
!R! RES; UNIT C; STM 2; SLM 2;
SFNT ”Swiss742SWC-RomanCondensed”;
NEWP;
PMZP 0, 0; SPD .2;
PMZP 0, 4; FONT 13; TEXT ’<===Paper edge limits’;
PMZP 0, 0; PARC 0, 0, .1, 0, 360;
PMRP 0, .333; TEXT ’   PMZP 0, 0;’;
PMZP 4, 0; PARC 4, 0, .1, 0, 360;
PMRP 0, .333; TEXT ’   PMZP 4, 0;’;
PMZP 3, 6; PARC 3, 6, .1, 0, 360;
PMRP 0, .333; TEXT ’   PMZP 3, 6;’;
PMZP 7, 7; PARC 7, 7, .1, 0, 360;
PMRP 0, .333; TEXT ’   PMZP 7, 7;’;
STRK;
PAGE;
EXIT;
```

Printout

PRBX — in Path, draw Round BoX

Format

PRBX *width*, *height*, *radius*;

Parameters

width:
width of round box

height:
height of round box

radius:
radius of round box

Function

The PRBX command adds a round box path to the current path. This command cannot paint figures by itself. In addition, STRK or FILL is required. Executing this command will close current sub-paths.

An error will result and the command has no effect if the width, height or radius of the round box are negative.

File

```
!R!
res;
unit c;

newp;
pmzp0,0;
prbx5,4,1;
strk;

pat5;
newp;
pmzp10,0;
prbx4,5,2;
fill;

res;
exit;
```

PRRC — in Path, at Relative position, draw aRC

Format

PRRC *#1*, *#2*, *#3*, *#4*, *#5*;

Parameters

#1:
X-coordinate of center of ellipse

#2:
Y-coordinate of center of ellipse

#3:
radius of ellipse

#4:
angle of start point on ellipse

#5:
angle of end point on ellipse

Function

The PRRC command adds an arc and a straight line to the center of the associated ellipse to the current path. This command cannot paint figures by itself. In addition, STRK or FILL is required.

This command is the same as PARC except for using relative values for coordinates.

An error will result and the command has no effect if the radius of the ellipse is negative.

File

```
!R!
res;
unit c;

newp;
pmzp0,0;
prrc10,10,5,0,210;
strk;

res;
exit;
```

PSRC — select Paper SouRCe

Format

PSRC *mode*;

Parameters

mode:

input cassette number:
0 = Manual feed/multi-purpose feeder
1 = Cassette 1/printer's cassette
2 = Cassette 2
3 = Cassette 3
4 = Cassette 4
5 = Cassette 5
6 = Cassette 6
99 = EF-1/UF-1
100 = Ignores the current cassette, the printer automatically finds and selects the paper cassette having the matching paper type and paper size as defined by MTYP and SPSZ respectively.

Function

The PSRC command is functionally equivalent to the old cassette select command CASS. We recommend that this command be used to select the paper feed source, rather than CASS.

Note: **To feed from the envelope feeder (or universal feeder), mode should be 99 for PSRC; and mode should be 4 for CASS.**

Each cassette of the optional paper feeder (PF-30) is assigned a cassette number in the order from the top as 1 through 6.

The PSRC 100; command enables the automatic cassette switching mode using media type. The printer automatically finds and selects the paper cassette having the matching paper type and paper size as defined by MTYP and SPSZ respectively.

An error will result and the command has no effect if parameters other than the above are used. The current paper source will remain selected if the specified cassette is not installed.

The PSRC command causes a page break, so it should be placed at the beginning of a file or program, or at the top of a new page.

PXPL — PiXel PLacement

Format

PXPL *mode*;

Parameter

mode:

mode
0: Grid intersection
1: Grid centered

Function

The PXPL command determines how pixels are rendered in images.

This command is ignored when used with DAP, DRP, DRPA, DZP, BOX, BLK, CIR, ARC, or PIE. This command has no effect for text or images.

The printer is reset to *grid intersection* mode by the RES command.

An error will result and the command has no effect if a mode other than 0 or 1 is specified.

Grid Intersection (HP)

Grid Centered (Windows)

File

```
!R!
res;
unit d;

simg4;

pxpl0;
newp;
pmzp300.5,300.5;
pdzp600.5,300.5;
pdzp600.5,600.5;
pdzp300.5,600.5;
clsp;
gpat0;
fill;

pxpl1;
newp;
pmzp300.5,300.5;
pdzp600.5,300.5;
pdzp600.5,600.5;
pdzp300.5,600.5;
clsp;
gpat1;
fill;

page;
exit;
```

!R! — Prescribe start sequence

Format

!*command-recognition-character*!

Parameter

command-recognition-character:
capital R, unless changed by the SCRC or FRPO P9 command

Function

When the printer receives !R!, it enters Prescribe mode and treats the following data as Prescribe commands.

The command that follows the !R! command should be separated from the !R! by a space or placed on a new line.

The command recognition character can be changed from capital R to another character. Temporary changes can be made using the SCRC (Set Command Recognition Character) command described later. The RES command restores the command recognition character to its FRPO-set value. Permanent changes can be made with the FRPO command described in *Chapter 5*.

If !R! is used by mistake when the printer is already in the Prescribe mode, the printer ignores the mistaken !R! and whatever follows, up to the next semicolon.

Related Command

EXIT, SCRC

File

```
Following these five
lines, the printer
enters PRESCRIBE
2e mode to execute
commands.
!R! UNIT I;
BOX 2, 2;
BOX 1, 1, E;
CIR 1;
BOX 1, 1;
PAGE;
EXIT;
```

Printout

Following these five
lines, the printer
enters PRESCRIBE
2emode to execute
commands.

RDMP — Received-data DuMP

Format

```
RDMP;
```

Parameter

None

Function

The RDMP command causes all subsequent data to be printed in hexadecimal form (two hexadecimal digits per character) until an ENDD (END Dump) command is received, or until the printer runs out of data and times out.

Related Command

ENDD

Sample

```
1B 25 2D 31 32 33 34 35 58 40 50 4A 4C 20 45 4E      .%-12345X@PJL EN
54 45 52 20 4C 41 4E 47 55 41 47 45 3D 50 43 4C      TER LANGUAGE=PCL
0A 1B 45 1B 26 6C 31 47 1B 26 6C 31 58 1B 26 6C      ..E.&l1G.&l1X.&l
30 53 1B 26 6C 30 6F 32 61 34 64 31 65 34 32 46      0S.&l0o2a4d1e42F
1B 26 6C 31 48 1B 2A 74 33 30 30 52 1B 2A 70 30      .&l1H.*t300R.*p0
59 1B 2A 70 30 58 1B 2A 70 32 33 32 58 1B 2A 70      Y.*p0X.*p232X.*p
2B 33 39 39 59 1B 2A 62 32 4D 1B 2A 72 31 41 1B      +399Y.*b2M.*r1A.
2A 62 31 36 57 00 01 F8 FF 00 E0 F8 00 01 1F F0      *b16W...........
F3 00 01 3F E0 1B 2A 72 42 1B 2A 70 2D 31 59 1B      ...?..*rB.*p-1Y.
2A 70 31 32 38 38 58 1B 2A 72 31 41 1B 2A 62 33      *p1288X.*r1A.*b3
57 01 FE 1F 1B 2A 72 42 1B 2A 70 2D 31 59 1B 2A      W....*rB.*p-1Y.*
70 31 35 39 32 58 1B 2A 72 31 41 1B 2A 62 31 36      p1592X.*r1A.*b16
57 00 03 FD FF 00 E0 E1 00 00 07 FD FF 02 E1 FF      W...............
E0 1B 2A 72 42 1B 2A 70 32 33 32 58 1B 2A 72 31      ..*rB.*p232X.*r1
41 1B 2A 62 32 33 57 00 01 F8 FF 04 E0 7F FF FF      A.*b23W........
F0 FD 00 03 01 FF FF 80 F5 00 02 03 FF FE 1B 2A      ...............*
72 42 1B 2A 70 2D 31 59 1B 2A 70 31 32 38 30 58      rB.*p-1Y.*p1280X
1B 2A 72 31 41 1B 2A 62 35 57 03 07 FC 7F 80 1B      .*r1A.*b5W.....
2A 72 42 1B 2A 70 2D 31 59 1B 2A 70 31 35 39 32      *rB.*p-1Y.*p1592
58 1B 2A 72 31 41 1B 2A 62 32 34 57 00 1F FD FF      X.*r1A.*b24W....
00 E0 EB 00 04 01 FF FF FF C0 FC 00 00 07 FD FF      ................
02 E1 FF FC 1B 2A 72 42 1B 2A 70 32 33 32 58 1B      .....*rB.*p232X.
2A 72 31 41 1B 2A 62 32 34 57 00 01 F8 FF 04 E0      *r1A.*b24W......
7F FF FF F0 FD 00 03 03 FF FF C0 F5 00 03 0F FF      ...............
FF 80 1B 2A 72 42 1B 2A 70 2D 31 59 1B 2A 70 31      ...*rB.*p-1Y.*p1
32 38 30 58 1B 2A 72 31 41 1B 2A 62 35 57 03 1F      280X.*r1A.*b5W..
FD FF E0 1B 2A 72 42 1B 2A 70 2D 31 59 1B 2A 70      ....*rB.*p-1Y.*p
31 35 38 34 58 1B 2A 72 31 41 1B 2A 62 32 34 57      1584X.*r1A.*b24W
00 03 FC FF 00 E0 EB 00 04 01 FF FF FF C0 FC 00      ................
00 07 FD FF 02 E1 FF FF 1B 2A 72 42 1B 2A 70 32      .........*rB.*p2
33 32 58 1B 2A 72 31 41 1B 2A 62 32 34 57 00 01      32X.*r1A.*b24W..
F8 FF 04 E0 7F FF FF F0 FD 00 03 07 FF FF F0 F5      ...............
00 03 1F FF FF E0 1B 2A 72 42 1B 2A 70 2D 31 59      .......*rB.*p-1Y
1B 2A 70 31 32 38 30 58 1B 2A 72 31 41 1B 2A 62      .*p1280X.*r1A.*b
35 57 03 3F F9 FF E0 1B 2A 72 42 1B 2A 70 2D 31      5W.?....*rB.*p-1
59 1B 2A 70 31 35 38 34 58 1B 2A 72 31 41 1B 2A      Y.*p1584X.*r1A.*
62 32 35 57 00 0F FC FF 00 E0 EB 00 04 01 FF FF      b25W...........
FF C0 FC 00 00 07 FD FF 03 E1 FF FF C0 1B 2A 72      ...............*r
42 1B 2A 70 32 33 32 58 1B 2A 72 31 41 1B 2A 62      B.*p232X.*r1A.*b
32 34 57 00 01 F8 FF 04 E0 7F FF FF F0 FD 00 03      24W............
0F FF FF F8 F5 00 03 1F FF FF F0 1B 2A 72 42 1B      ............*rB.
2A 70 2D 31 59 1B 2A 70 31 32 38 30 58 1B 2A 72      *p-1Y.*p1280X.*r
31 41 1B 2A 62 35 57 03 FF F9 FF F0 1B 2A 72 42      1A.*b5W......*rB
1B 2A 70 2D 31 59 1B 2A 70 31 35 38 34 58 1B 2A      .*p-1Y.*p1584X.*
72 31 41 1B 2A 62 32 37 57 06 3F FF FE FF FF FF      r1A.*b27W.?.....
E0 EB 00 04 01 FF FF FF C0 FC 00 00 07 FD FF 03      ................
E1 FF FF F0 1B 2A 72 42 1B 2A 70 32 33 32 58 1B      .....*rB.*p232X.
```

RES — RESet

Format

```
RES;
```

Parameter

None

Function

The RES command causes a page break and resets parameters as indicated below.

Some reset values can also be changed by the FRPO command. For these, the factory reset value is given, followed by the FRPO parameters that can be used to change this value in parenthesis.

In HP-7475A emulation, the RES command resets the printer environment in the same manner as the KC-GL DF instruction. Refer to section 6.8.

Parameter	Value after reset (Related FRPO parameter)			Related Prescribe 2e Commands
	LaserJet	IBM/Epson	Diablo	
Command recognition character	R (P9)	←	←	SCRC
Emulation mode	6 (P1)*	←	←	SEM
Unit of measurement	Inches	←	←	UNIT
Number of copies per page	1*	←	←	COPY
Cassette	Cassette 1 (printer's cassette) (R4)*		←	CASS
Paper tray	Face-down (R0)*	←	←	STAK
Paper size	Cassette size (R2)*	←	←	SPSZ

Parameter	Value after reset (Related FRPO parameter)			Related Prescribe 2e Commands
	LaserJet	IBM/Epson	Diablo	
Top margin	1/2 inch (150 dots)	0 (A1/2)	←	STM
Left margin	Left logical	0 (A3/4)	←	SLM
Right margin	Right logical	Max. size (A5/6)	←	SRM, SPW
Bottom margin	1/2 inch (150 dots)	Max. size (A7/8)	←	SBM, SPL, SLPP
Page orientation	Portrait (Orientation of font C5/2/3)	Portrait (Orientation of font C5/2/3)	Portrait (C1)*	SPO
Line spacing	6 lpi (U0/1)	←	←	SLS, SLPI
Character spacing	10 cpi (Spacing of font C5/2/3)	10 cpi (U2/3)	←	SCS, SCPI
Underline thickness and distance below baseline	4 dots, 7 dots	←	←	SULP
Current font	Font 1 (C5/2/3) or V3 (scalable font)*	Font 8 (IBM) Font 1 (Epson)	Font 1 (C5/2/3) or V3 (scalable font)*	FONT, FSET, SFNT
Alternate font assignment	None	See Chap. 6.	←	SETF
Country code	0 (U6)*	←	←	INTL
Symbol set	Roman-8 (U6/7)	See Chap. 6.*	US ASCII (U7)*	CSET, INTL
Current path	Empty	←	←	NEWP
Graphics pen diameter	3 dots	←	←	SPD
Line cap	Square	←	←	SCAP
Line join	Beveled join	←	←	SLJN
Miter limit	10	←	←	SMLT
Flatness	1	←	←	FLAT
Dash pattern	Solid line	←	←	DPAT, SDP
Clipping rectangle	Size of printable page		←	CLPR
Fill pattern	Solid black	←	←	PAT, FPAT, GPAT

* These values can be set as permanent using the printer's control panel only when the FRPO C6 (panel keep) is active with a parameter of 1 (default).

Parameter	Value after reset (Related FRPO parameter)			Related Prescribe 2e Commands
	LaserJet	IBM/Epson	Diablo	
Image model	Transparent [3]	←	←	SIMG
Graphics resolution	75 dpi	←	←	STR
CR action	CR	CR (P2)	←	–
LF action	LF	LF (P3)	←	–

The RES command does not:

- delete permanent macros or permanent fonts from memory
- delete positions or fonts stored by the SCP and SCF commands
- reset font attributes set by the SFA command
- change any values in permanent memory (Refer to the FRPO INIT command page.)

RESL — select RESoLution

Format

RESL *resolution*;

Parameter

resolution:
300 [dpi] or 600 [dpi]

Function

The RESL command switches the resolution of the printer between 300 dpi and 600 dpi. The first thing that happens when this command is received is the image data currently remaining is forcibly output on paper. This does not affect the current unit of measure, but the system's memory will be reconfigured, causing PCL resources (fonts, macros, patterns, and symbol sets) which have been downloaded into RAM to be purged.

The printer's resolution setting enabled by this command is reset to default (FRPO N8), if a command which results in reset (RES, FRPO and SEM) is received. Actual resolution may be decreased to 300 dpi even though printer resolution is set to 600 dpi when there is insufficient memory because a duplex unit is installed and duplex mode has been set or because VRAM size has been increased for page protection.

Printer resolution cannot be switched from 300 dpi to 600 dpi for the following emulations.

Line printer
IBM ProPrinter
Diablo 630
EPSON LQ850

An error will result and the command has no effect if parameters other than the above are used.

RGST — offset ReGiSTration

Format

RGST *horizontal-offset*, *vertical-offset*;

Parameters

horizontal-offset:
horizontal offset value from the absolute coordinate (0, 0) for the physical paper feed direction, in current unit. The coordinates may be positive or negative.

vertical-offset:
vertical offset value from the absolute coordinate (0, 0) for the physical paper feed direction, in current unit. The coordinates may be positive or negative.

Function

This command moves the coordinate origin by the offset (physical horizontal and vertical directions) as measured from the values specified. The intersection (shared area) of the current printable area and the printable area shifted by the new offset registration is defined as the valid printable area.

No page break is caused when this command is received. The offset values set using this command are valid even when the printer is in HP emulation mode.

Since this command is PCL command-compatible (<Esc>&ℓ#U, <Esc>&ℓ#Z), the offset values are cleared to zero only by a software reset (<Esc>E). In other words, the offset is only cleared by PRESCRIBE (RES and FRPO INIT commands) when the emulation is HP.

An error will result and the command has no effect if a command format other than the above is used. An error will result and the value in question will be ignored if *horizontal-offset* or *vertical-offset* is specified as a value exceeding the physical dimensions of the current paper size.

RPCS — Return to Previous Code Set

Format

```
RPCS;
```

Parameter

None

Function

The RPCS command resumes use of a code set saved by a previous SCCS (Save Current Code Set) command. The RPCS commands return to the code sets in reverse order in which they were saved.

Related Commands

RPF, SCCS, SCF

File

See the SCCS command page.

RPF — Return to Previous Font

Format

```
RPF;
```

Parameter

None

Function

The RPF command resumes use of a font saved by a previous SCF (save current font) command. The RPF commands return to the fonts in the reverse order in which they were saved.

SCF and RPF are particularly useful in macros.

File

```
!R! RES; UNIT P;
MCRO SMALLPRINT;
SCF; FSET 10V; TEXT %1, E;
RPF;
ENDM;
SFNT 'Swiss742SWC-Roman', 12; SLS 14;
EXIT;
Computer literature is littered with acronyms such
as !R! CALL SMALLPRINT, 'CPU, DOS, EEPROM';
EXIT; and the like. Small capitals
make these easier to read. Compare the effect of
printing CPU, DOS, and EEPROM in regular capitals.
!R! PAGE; EXIT;
```

Printout

Computer literature is littered with acronyms such
as CPU, DOS, EEPROM and the like. Small capitals
make these easier to read. Compare the effect of
printing CPU, DOS, and EEPROM in regular capitals.

RPG — Return to Previous Graphics state

Format

```
RPG;
```

Parameter

None

Function

The RPG command restores the graphics state most recently saved by a SCG command. The following items of graphics state revert to the state saved previously.

Current path and cursor position (if defined)
Current pen diameter (line width)
Current line join type
Current line cap type
Current miter limit
Current dash pattern
Current flatness
Current fill pattern (16 × 16 dots)
Current clipping rectangle
Current raster resolution
Current image model

It is useful to save the graphics state then later restore it when you want to use a path for both stroking and filling. One such example is shown on the next page.

The RPG command does not affect other printer parameters such as page orientation, unit of measurement, etc. (See the RES command page.)

Related Command

SCG

File

```
!R! RES; UNIT C;
NEWP;
PMZP 4, 2;
PARC 3, 3, 1, 90, 270;
PARC 5, 3, 1, 270, 90;
CLSP;
SCG;    CMNT Saves the graphics state;
STRK;   CMNT Strokes the path;
RPG;    CMNT Restores the graphics state;
GPAT .5;
FILL 1; CMNT Fills the path;
PAGE;
EXIT;
```

Printout

RPP — Return to Previous Position

Format

```
RPP;
```

Parameter

None

Function

The RPP command moves the cursor to a position saved by a previous SCP (Save Current Position) command. If the RPP command is executed by mistake when no previous position has been saved, the resulting cursor movement is unpredictable.

The RPP command can be used in both standard mode and path mode graphics.

Related Command

SCP

File

```
!R! RES; UNIT P;
SFNT 'Swiss742SWC-BoldItalic', 16;
UNIT C;
MAP 8, 8; CIR .2;
MRP -.1, .1;
CMNT Save this position seven times;
SCP; SCP; SCP; SCP; SCP; SCP; SCP;
MRPA 2, 0; TEXT 'N';
RPP; MRPA 2, 45; TEXT 'NE';
RPP; MRPA 2, 90; TEXT 'E';
RPP; MRPA 2, 135; TEXT 'SE';
RPP; MRPA 2, 180; TEXT 'S';
RPP; MRPA 2, 225; TEXT 'SW';
RPP; MRPA 2, 270; TEXT 'W';
RPP; MRPA 2, 315; TEXT 'NW';
PAGE;
EXIT;
```

Printout

RPU — Return to Previous Unit

Format

```
RPU;
```

Parameters

None

Function

The RPU command brings the unit of measurement (inches, centimeters, points, or dots; as specified by the UNIT command) back to the unit saved by the SCU (Save Current Unit) command.

Related command

SCU

File/Printout

See the SCU command page.

RTTX — RoTate TeXt

Format

RTTX *angle*, '*string*'[, *U-option*];

Parameters

angle:
angle of rotation in degrees

string:
character string

U-option:
Underline text

Function

Taking the normal output angle for text as zero, the RTTX command rotates a character string around its starting point by the angle of rotation specified.

This command is ignored if the current font is a bitmap font. After this command is executed, text output returns to original orientation.

File

```
!R!
res;

SFNT' Courier-SWC', 18;
mzp3, 3;
rttx0,'Rotate0';
rttx60,'Rotate,60';
rttx120,'Rotate,120';
rttx180,'Rotate,180';
rttx240,'Rotate,240';
rttx300,'Rotate,300';

page;exit;
```

RTXT — print Right-aligned TeXT

Format

RTXT ['*string*'][,*option*][,*U-option*];

Parameters

string:
any character string

option:
B=Leave cursor at back end of string
E=Move cursor to front end of string
L=Move cursor down one line
N=Move cursor to beginning of next line

U-option:
Underline text

Function

The RTXT command prints the given string, ending at the cursor location, then moves the cursor as designated by the option. It accepts either a bitmap font or a scalable font to print the string.

The string must be enclosed in either single or double quotation marks. (If the string includes one kind of quotation mark, use the other kind to enclose it.) If the string is omitted, nothing is printed. If the option is omitted, the cursor is not moved (same as option B). If the U-option is specified, the string is underlined. The underline thickness and location can be set by the SULP command.

The RTXT command can be used to position a line of text so that it ends at an exact location. The RTXT command should be executed between left and right margins.

The length of the string is unlimited, except that the command as a whole may not be longer than 255 characters. Carriage-return and linefeed codes in the string are ignored.

The RTXT command can be used both in the standard mode and path mode graphics.

File

```
!R! RES;
UNIT P;
SFNT 'Dutch801SWC-Roman';
UNIT I;
MCRO PF;
MRP .15, 0;
BOX .1, -.1; MRP   .5, 0;
BOX .1, -.1; MRP -.65, 0;
ENDM;
MAP 3, 3; TEXT 'Pass     Fail', L, U;
CALL PF;  RTXT 'Unit test', L;
CALL PF;  RTXT 'Integration test', L;
PAGE;
EXIT;
```

Printout

	Pass	Fail
Unit test	☐	☐
Integration test	☐	☐

RVCD — ReceiVe Compressed raster Data

Format

RVCD[*compression-mode*]; *length*, *data*, ... ;

Parameters

compression-mode:

0 = Uncompressed
1 = Run-length encoding
2 = TIFF (Tagged Image File Format) rev. 4.0

length:

bytes of raster data

data:

binary raster data, 0H-FFH

Function

The RVCD command transfers and encodes the subsequent raster data by the amount of bytes represented by the *length* parameter.

The STR command sets the dot resolution for raster graphics which starts at the current cursor position. The SRO command specifies the orientation of the raster image in either physical (default) or logical page direction.

If the *compression-mode* value is zero [or omitted], the printer simply transfers raster data in an uncompressed binary format. A single bit means a single dot. Seventh bit in the first byte refers to the starting dot within that raster row and bit 0 refers to the eighth dot and continues.

In the *run-length* encoding mode, the printer treats raster data in pairs of bytes. The first byte of each pair is the repetition count for the data in second pattern byte. The repetition count accepts any value within a range of 0H to FFH.

Compression mode 2, TIFF rev. 4.0, translates raster data to be *packbits* in which a control byte precedes the raster data. A TIFF rev. 4.0 encoded data arrangement appears below.

> *control byte* (1 byte) + data (1–128 bytes) + *control byte* (1 byte) + data (1–128 bytes) ...

A control byte with a negative value from *-127* to *-1* (*81H* to *FFH*) means the repetition count for the subsequent data. A zero to *127 (0H* to *7FH*) indicates the number of data bytes that follow. A control byte of *-128* (*80H*) represents a non-operative control byte.

Related Commands

ENDR, STR

RVRD — ReceiVe Raster Data

Format

RVRD; *number of data*, *data*, ... ;

Function

The RVRD command declares the start of raster data. Raster data represents dot lines encoded as numeric values as shown below. Each dot line is divided into 8-dot segments. Each segment is converted to a number by the same system of column weights as used in the FPAT command.

The first segment in the example above encodes to 7 as follows:

0+0+0+0+0+4+2+1=7

The second segment encodes similarly to 192:

128+64+0+0+0+0+0+0=192

In the printer command language, the segments are being treated as bytes of data in which the black dots are 1s and the white dots are 0s. The raster data values are the decimal values of the bytes.

Each line of raster data starts with a positive integer (1 to 511) indicating the number of segments in the line (2 in the example shown). The raster data follows, separated by commas. Each data value is an integer from 0 to 255. A semicolon ends the line. Spaces occurring anywhere in the line are ignored.

Carriage returns following commas are also ignored, so long as raster lines can be broken up if necessary, as shown below. The carriage return must be placed after a comma, as follows:

```
34, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
1, 1, 1;
```

There are no limits on the length of a raster line or the number of lines.

Zeros can be omitted, retaining only the delimiting commas. For zeros at the end of the line, the commas can also be omitted. The following example displays equivalent raster data lines:

`7, 0, 0, 15, 0, 15, 0, 0;` and `7, , , 15, , 15;`

The following example demonstrates two ways to produce a blank raster line:

`1, 0;` or `1, ;`

The following examples produce invalid raster data lines:

Wrong:

`0,;` Count cannot be 0.
`1;` Use `1,;` for a blank line.
`2, 1, 1, 1;` Too many data values.
`2, -1, -1;` Negative values are not allowed.
`2, 1`
`, 1;` Carriage return before comma.

An invalid raster data line is not printed, and invalidates all raster lines that follow.

Again, the following example demonstrates how to create the raster graphic on the previous page.

```
!R! STR 75; RVRD;
2;A|0;
2;GG0;
2;^S;
2;~{>>;
2;^S;
2;GG0;
2;A|0;
ENDR;
PAGE; EXIT;
```

The value 2 in each raster data line indicates the number of data which follows. The subsequent data can be obtained by following the same procedure as explained in *Chapter 3*.

RWER D — [Read/Write External Resource] Delete data on external media

Format

RWER D, *medium*, *data-type*[, '*partition-name*'];

Parameters

medium:

0 = Hard disk
A = Memory card (Slot A)

data-type:

type of data to be deleted
1 = Font data
2 = Printable data
16 = Macro data
112 = File data
128 = API data (downloaded program)
224 = Engine program data
241 = Panel message data

partition-name:

Name of partition from which data is deleted. If the partition name is omitted, all data of the given type will be deleted.

Function

The RWER D command deletes data on any external media whether it is a memory card or the hard disk. This command has no effect if the media has been write protected using KPDL or PJL.

The partition name may be a maximum of 15 printable ASCII characters (20H through 7EH); upper and lower case letters are regarded distinct. A partition name may not have leading spaces, and in the command, the partition name must be enclosed in single or double quotation marks.

A partition list is not automatically printed when deleting data on external media, even though the automatic printing of partition information was enabled (by the RWER I command [See page 2-251]).

A command error results and the command has no effect if parameters other than the above are used.

Note that only data types 1, 2, 16 are currently allowed for parameter *data-type*.

RWER F — [Read/Write External Resource] Format external media

Format

```
RWER F, medium;
```

Parameter

medium:

0 = Hard disk
A = Memory card (Slot A)

Function

The RWER F command formats any external media whether it is a memory card or the hard disk. The hard disk is physically formatted when it is specified. This command has no effect if the media has been write-protected using KPDL or PJL.

A partition list is not automatically printed when formatting external media.

A command error results and the command has no effect if parameters other than the above are used.

RWER I — [Read/Write External Resource] automatically print partition Information

Format

RWER I, *mode*;

Parameter

mode:

control mode:
E = Enable automatic printing of partition information
D = Disable automatic printing of partition information

Function

The RWER I command toggles the automatic printing of partition lists for any external media whether it is a memory card or the hard disk. With the automatic printing of partition lists enabled (RWER I, E;), the printer prints partition lists whenever data are written to external media.

The setting made with this command returns to default when the power is turned off.

A command error results and the command has no effect if parameters other than the above are used.

RWER L — [Read/Write External Resource] print partition List

Format

```
RWER L[, medium];
```

Parameter

medium:

0 = RAM disk/Hard disk
A = Memory card (Slot A)
E = EPROM

Function

The RWER L command explicitly prints partition lists for any external media whether it is a memory card, the hard disk, or the RAM disk. The lists of partitions for all external media can be printed by omitting parameter *medium*.

Disk capacity, font cache capacity and data type are listed, with login file names for file data output in separate columns.

A command error results and the command has no effect if parameters other than the above are used.

RWER R — [Read/Write External Resource] Read data from external media

Format

`RWER R,` *medium*`,` *data-type*`, '`*partition-name*`';`

Parameters

medium:

0 = RAM disk/Hard disk
A = Memory card (Slot A)
E = EPROM

data-type:

2 = Printable data
128 = API data (downloaded program)

partition-name:

Name of partition from which data is read. (Spaces within a partition name are ignored.)

Function

The RWER R command reads data from any external media whether it is a memory card or the hard disk. This command is functionally equivalent to the ICCD R command. We recommend using this command in place of ICCD R or EPRM R depending on the value in parameter *medium*.

This command supports all types of media including memory cards, flash ROM and EPROMs.

If the same partition name exists on different external media, the priority with which data is read is as follows.

(High) Card > Hard disk (RAM disk) > EPROM (Low)

Note that only data type 2 is allowed for parameter *data-type*. A command error results and the command has no effect if parameters other than the above are used.

RWER S — [Read/Write External Resource] Store TrueType font

Format

```
RWER S, #1, #2, #3, #4, #5[,#6, #7, #8, #9];
<binary data>WRED;
```

Parameters

#1:

drive specification:
0 = RAM disk/Hard disk drive number
A = Memory card slot A

#2:

font type:
0 = TrueType font
1 = Japanese TrueType font
2 = Japanese TrueType Collection font

#3:

file name: (string of up to 11 characters; the extension .INF is added internally.) This string must be enclosed in either single or double quotation marks.

#4:

font name (ASCII text string up to 31 characters long; only up to 28 characters if #2 = 2). This string must be enclosed in either single or double quotation marks.

#5:

font data length (number of bytes sent as <*binary data*>)

#6:

font symbol set value (1 to 65535, 619: Shift JIS code)

#7:

font style (0 to 32767)

#8:
stroke weight (-127 to +127)

#9:
type face (0 to 32767)

<binary data>:
font data (TrueType format)

Function

The RWER S command allows outline fonts (in TrueType format) to be downloaded to the printer and to be stored on the specified media as font data. TrueType fonts particularly can be defined easily just by adding the TrueType font format as *<binary data>*.

Always explicitly terminate the end of font data using `WRED;`. The five bytes represented by `WRED;` are not counted as part of the font data length.

Since parameters #6, #7, #8 and #9 represent font attributes they have an affect during font selection. Although parameters #6 through #9 may be omitted, we recommend that parameters up through #9 be used to define font selection information.
In order to delete a Japanese TrueType font defined using this command, it is necessary to delete two separate file names using `RWER D, 'xxxxxx'` and `RWER D, 'xxxxxx.inf'`.
Up to 512 fonts may be registered on a single memory card or up to 4096 on a single hard disk. Note carefully that registration beyond this limit will result in data being interpreted as unneeded.

Only 28 characters are valid for Japanese TrueType font names when #2 = 2 is specified because the system automatically appends `(P)` for proportional fonts and `(F)` for fixed pitch fonts.

A command error will result and the command has no effect if any of the parameters are outside the given range. This command is ignored if even one parameter error occurs.
The font data following the semicolon for this command must match the length given by parameter #5. An error will result and the font data will not be defined if the data length is shorter than specified.

RWER T — [Read/Write External Resource] set Terminate string

Format

```
RWER T[, 'terminator'];
```

Parameter

terminator:
string of up to 4 bytes, enclosed in either single or double quotation marks

Function

The RWER T command sets a terminator string for external media whether it is a memory card or the hard disk. This terminator is used when storing binary data to external media. See the RWER S command page (page 2-255) for example. WRED is set as the default terminator if parameter *terminator* is omitted.

A command error results and the command has no effect if parameters other than the above are used.

RWER W — [Read/Write External Resource] Write data to external media

Format

RWER W, *medium*, *data-type*[, '*partition-name*'];

Parameters

medium:

0 = RAM disk/Hard disk
A = Memory card (Slot A)

data-type:

1 = Font data
2 = Printable data
16 = Macro data
112 = File data
128 = API data (downloaded program)
224 = Engine program data
241 = Panel message data

partition-name:

Name of partition to which data is written. If this parameter is omitted the printer will automatically determine the partition name. (Spaces within a partition name are ignored.)

Function

The RWER W command writes data to any external media whether it is a memory card or the hard disk. This command is functionally equivalent to the ICCD W command. We recommend using this command in place of ICCD W depending on the value in parameter *medium*.

This command has no effect if an attempt is made to write a data type not supported by the hard disk.

Note that only data types 1, 2, 16, 112 and 128 are allowed for parameter *data-type*.

Although all data types may be written up to the amount allowed by the storage size of the given media, note carefully that writing beyond this limit will result in data being interpreted as unneeded.

Even if data is written to a device using the same file name, that data will be written without overwriting the original file. A partition list will be printed as a warning when this happens.

A command error results and the command has no effect if parameters other than the above are used.

SBM — Set Bottom Margin

Format

`SBM` *length*`;`

Parameters

length:
distance from top of paper to bottom margin

Function

The SBM command sets the bottom margin, as measured from the top edge limit of the paper in the units designated by the UNIT command.

If an attempt is made to print below the bottom margin, the characters will be printed on the next page.

A bottom margin setting in a document file should be placed at the beginning of the file or at a page break.

The SPL (set page length) and SLPP (set lines per page) commands also set the bottom margin, but these commands measure from the top margin position.

File

```
!R! RES; UNIT C;
STM 1; SLS 1; SBM 11;
SFNT ”Swiss742SWC-RomanCondensed”;
EXIT, E;
Top margin at 1 cm, bottom margin at 11 cm. (Line 1)
Line 2
Line 3
Line 4
Line 5
Line 6
Line 7
Line 8
Line 9
Line 10
Line 11
Line 12
!R! PAGE; EXIT;
```

Printout

SCAP — Set line CAP

Format

SCAP *line-cap mode*;

Parameters

line-cap mode:

1=Square caps
2=Butt caps
3=Round caps

Function

The SCAP command determines the shape of line ends (or a line cap) in a path where they are finally stroked. The default caps is *butt caps* (2).

Square caps have square ends which extend one-half of a line width beyond the endpoints of the line. *Butt* caps are similar to square caps but the caps are flash with the endpoints and do not extend beyond them. *Round* caps end the lines with semicircular caps with diameters identical to the line width.

Square caps (default)

Butt caps

Round caps

File

```
!R! UNIT C; SPD .5;
NEWP; CMNT Round-capped on every end;
SCAP 3;
PMZP 6, 6;
SCP; SCP;
PDRP 1, -1; RPP;
PDRP 1,  1; RPP;
PDRP 5,  0;
STRK;
PAGE; EXIT;
```

Printout

SCCS — Save Current Code Set

Format

```
SCCS;
```

Parameters

None

Function

The SCCS command instructs the printer to remember the code set of the current font. This command may be used in conjunction with a SCF (Save Current Font) command to prevent the font from losing the current code set after a command operation has been made, even if the command changes the code set (macro, etc.).

To return to the saved code set later, use the RPCS (Return to Previous Code Set) command. In the case of using the SCCS command together with a SCF command, it is recommended that the RPCS command be used with a RPF command.

The current code set can be saved up to eight times using a separate SCCS for each. RPCS commands retrieve the previously saved code set in reverse order.

Related Command

RPCS, RPF, SCF

File

```
!R! RES; SFNT ‘Dutch801SWC-Roman’; SCF; SCCS;
SLPI 3;
TEXT ’The following line is printed using ISO 6: ASCII’, L;
TEXT ’@ABCDEFG’, L;
TEXT ”Now changing to Ventura Math, using a different font”, L;
SFNT ”Swiss742SWC-Roman”; CSET 6M; TEXT ’@ABCDEFG’, L;
RPF; RPCS;
TEXT ’Now bringing the previous font and code set back by a RPF and
RPCS command.’, L;
TEXT ’@ABCDEFG’;
PAGE;
EXIT;
```

Printout

The following line is printed using ISO 6: ASCII

@ABCDEFG

Now changing to Ventura Math, using a different font

≅ΑΒΧΔΕΦΓ

Now bringing the previous font and code set back by a RPF and RPCS command.

@ABCDEFG

SCF — Save Current Font

Format

```
SCF;
```

Parameter

None

Function

The SCF command saves the current font so that it can be retrieved later using the RPF (Return to Previous Font) command. The font to be saved can be either a bitmap font or a scalable font.

Up to eight font numbers can be saved in the printer's memory by SCF commands (using a separate SCF command for each).

The SCF command only instructs the printer to remember the font. It does not move actual fonts in or out of memory.

Related Command

RPF

File

```
!R! RES;
SLM 1; STM 2;
SFNT 'Dutch801SWC-Roman', 12;
EXIT;
Affixed to the door was a large sign that read:

!R! SCF; SFNT 'Swiss742SWC-BoldItalic', 20;
MRP 1.5, .423;
TEXT 'KEEP OUT';
RPF;
EXIT;

Being one of those people who assume that such
signs are put up to be ignored, she reached out
```

Printout

Affixed to the door was a large sign that read:

KEEP OUT

Being one of those people who assume that such
signs are put up to be ignored, she reached out

SCG — Save Current Graphics state

Format

```
SCG;
```

Parameter

None

Function

The SCG command saves the graphics state comprised of the following characteristics:

Current path and cursor position
Current pen diameter
Current line join
Current line cap
Current miter limit
Current dash pattern
Current flatness
Current current fill pattern (16 × 16 dots)
Current current clipping path
Current raster resolution
Current image model

Once the current graphics state is saved, it can be retrieved later using the RPG command. Saving and retrieving the graphics state in this way simplifies recovery of paths which stroke a filled and outlined shape. Note that the FILL command clears the current path, leaving no strokable path.

The printer holds as much graphics state information as the user memory area can accommodate; however, graphics state information larger than the memory area can cause a memory error.

Related Command

FILL, RPG

File

```
!R! RES; UNIT C;
NEWP;
PMZP 5, 5;
SFNT ’Swiss742SWC-Bold’, 72;
CPTH ’Mary’;
SCG;
STRK;
RPG;
GPAT .9;
FILL 1;
PAGE;
EXIT;
```

Printout

SCP — Save Current Position

Format

```
SCP;
```

Parameter

None

Function

The SCP command instructs the printer to remember the current cursor position, so that it can be retrieved later using the RPP (Return to Previous Position) command.

Up to eight positions can be saved in the printer's memory (using a separate SCP command for each). RPP commands return to the positions in the reverse order in which they were saved.

Related Command

RPP

File

See the RPP command.

SCPI — Set Characters Per Inch

Format

`SCPI` *number*`;`

Parameters

number:
number of characters per inch

Function

The SCPI command sets the number of characters per inch (even if the UNIT command designates a non-inch unit).

When a proportionally-spaced font is used and the font mode (FTMD) is 0 to 3 or 8 to 11, SCPI 0 (zero) must be specified to obtain the innate spacing of each character. A non-zero specification results in unnatural spacing of proportional fonts.

SCPI 0 does not change the width of the space character.

The character spacing can also be controlled by the SCS (set character spacing) command.

Related Command

SCS

File

```
!R! RES; SLM 1; STM 2; EXIT;
This line has 10 characters per inch.
!R! SCPI 8; EXIT;
This line has 8 characters per inch.
!R! SFNT 'Swiss742SWC-Roman', 10; SCS .2; EXIT;
This proportional font
is printed with fixed
spacing.
!R! SCS 0; EXIT;
This is correct proportional spacing.
!R! PAGE; EXIT;
```

Printout

```
This line has 10 characters per inch.

This line has 8 characters per inch.

T h i s   p r o p o r t i o n a l   f o n t
i s   p r i n t e d   w i t h   f i x e d
s p a c i n g .

This is correct proportional spacing.
```

SCRC — Set Command Recognition Character

Format

`SCRC` *character*`;`

Parameters

character:
new command recognition character, any character from ASCII code 33 (!) to ASCII code 126 (~) except the apostrophe ('), quotation mark (") or semicolon (;).

Function

The SCRC command changes the command recognition character between the exclamation points in the Prescribe start sequence.

The change remains in effect until power is turned off or a RES (reset) command is executed.

Originally the command recognition character is the capital letter R within the Prescribe start sequence of !R!.

One reason for changing the command recognition character is to print listings of files or programs containing Prescribe commands. If the command recognition character is not changed, then instead of printing the Prescribe commands, the printer will execute them.

File

```
!R! RES; UNIT C;
GPAT .7; BLK 1, 1;     BOX 1, 1, E;
GPAT .5; BLK 1.3, 1.3; BOX 1.3, 1.3, E;
GPAT .3; BLK 1.6, 1.6; BOX 1.6, 1.6, E;

CMNT Now list the above commands;

SCRC L;
EXIT;

!R! RES; UNIT C;
GPAT .7; BLK 1, 1;     BOX 1, 1, E;
GPAT .5; BLK 1.3, 1.3; BOX 1.3, 1.3, E;
GPAT .3; BLK 1.6, 1.6; BOX 1.6, 1.6, E;
PAGE; EXIT;
!L! RES; EXIT;
```

Printout

```
!R! RES; UNIT C;
GPAT .7; BLK 1, 1;     BOX 1, 1, E;
GPAT .5; BLK 1.3, 1.3; BOX 1.3, 1.3, E;
GPAT .3; BLK 1.6, 1.6; BOX 1.6, 1.6, E;
PAGE; EXIT;
```

SCS — Set Character Spacing

Format

`SCS` *distance*`;`

Parameters

distance:
character-to-character spacing, or 0

Function

The SCS command sets the distance from the beginning of one character to the beginning of the next character.

When a proportionally-spaced font is used and the font mode (FTMD) is 0 to 3 or 8 to 11, SCS 0 (zero) must be specified to obtain the innate spacing of each character. A non-zero specification results in unnatural spacing of proportional fonts.

SCS 0 does not change the width of the space character.

The character spacing can be set using either the SCS or the SCPI command.

File

```
!R! RES; SLM 1; STM 2; EXIT;
This line has the default spacing.
!R! UNIT C; SCS .3; EXIT;
This line has a slightly wider spacing.
!R! SFNT 'Dutch801SWC-Roman', 10; SCS .2; EXIT;
This is a proportional font printed with fixed spacing.
!R! SCS 0; EXIT;
This is correct proportional spacing.
!R! PAGE; EXIT;
```

Printout

This line has the default spacing.

This line has a slightly wider spacing.

This is a proportional font printed with fixed spacing.

This is correct proportional spacing.

SCU — Save Current Unit

Format

```
SCU;
```

Parameters

None

Function

The SCU command instructs the printer to save the current unit of measurement. Saving the current unit can prove useful when a macro containing a UNIT command changes the unit of measurement. The saved unit can be retrieved later using the RPU (Return to Previous Unit) command.

The current unit can be saved up to eight times using a separate SCU command for each. RPU commands retrieve the unit of measurement in reverse order.

Related command

SCF, SCP, UNIT

File

```
!R! FRPO N8, 0; RES;
SENT "Swiss742SWC-RomanCondensed", 9;

UNIT C; SCU;
MZP 1.5, 1.5;
TEXT "THE DAYS ON THE ISLAND: PART I", U:

MCRO TITLE;
FSET 24V;
UNIT I;
MZP 4, 3;
CIR 2;
MRP –1.5, .125;
TEXT %1;
ENDM;

CALL TITLE, "CHAPTER 1: PROLOGUE";

RPU;
SLM 2;
STM 13;
FSET 12v;
EXIT;
My long anticipated vacation started at Mallorca
island which
```

Printout

THE DAYS ON THE ISLAND: PART I

CHAPTER 1: PROLOGUE

My long anticipated vacation started at Mallorca island which

SDP — Store Dash Pattern

Format

SDP *pattern-number*, *dash1*, *space1*, *dash2*, *space2*, ..., *dash10*, *space10*;

Parameters

pattern-number:
number from 11 to 20

dash1 ... 10:
length of dash

space1 ... 10:
space between dashes

Function

The SDP command generates a new dash pattern used by the DPAT command for stroking a path. The *dash* and *space* values represent the lengths of alternating black and white segments for stroking the line segment in the path, using the unit value designated by the UNIT command.

For example, SDP 11, 2, 2, 5, 5; stores the following dash pattern in pattern number *11*:

The maximum number of pairs of dash and space allowed for a SDP command is *10*. If the dash pattern begins with a space, *0* must be specified for the first *dash* value (*dash1*). To end the pattern with a dash, the last *space* value may be omitted.

The user-defined dash patterns are valid until another SDP command changes the current definition or until the printer is switched off.

Related Commands

DPAT

File

```
!R! RES; UNIT P;
SDP 11, 2, 2, 5, 5;
NEWP;
UNIT C;
SPD .2;
         PMRA 10, 10, 3, 0;
DPAT 11; PARC 10, 10, 3, 0, 360;
STRK;

PAGE;
EXIT;
```

Printout

SEM — Set Emulation Mode

Format

SEM *mode*;

Parameters

mode:

0=Line Printer
1=IBM Proprinter X-24E
2=Diablo 630
5=Epson LQ-850
6=HP LaserJet
8=KC-GL (Plotter)
9=KPDL (an option on some models)

Function

The SEM command temporarily changes the printer's emulation mode. The new mode remains in effect until another SEM or an RES (reset) command is issued.

The SEM command also resets the margins and various other parameters. It should therefore be placed at the beginning of a program or file.

The SEM command does not change the power-up emulation mode. When power is switched off, the printer loses the mode set by the SEM command. Upon power up, it retains the default emulation, which is set by the P1 parameter of the FRPO command.

If you usually work in emulation A but occasionally use emulation B, it is convenient to set emulation A with the FRPO command and use the SEM command to change to emulation B when necessary. In this case you must avoid using the RES command in emulation B, because the RES command resets the printer to emulation A.

File

```
!R! CMNT To work temporarily in the LQ-850
emulation;
SEM 5;
EXIT;
```

Printout

Omitted

SETF — SET alternate Font

Format

SETF *alternate-number*, *font-number*;

Parameters

alternate-number:
a number from 0 to 31

font-number:
a number from 0 to 65535

Function

The SETF command assigns a font to an alternate number, so that it can be selected by the ALTF (ALTernate Font) command. The font number can be one of the resident font numbers or the number of a nonresident font defined by LDFC commands.

A scalable font can also be assigned to an alternate number when given a temporary font number in advance. See the SFNT command page.

In some emulation modes, default assignments are given to low alternate numbers so that SETF commands can be embedded for some word processing software. See *Chapter 6*.

File

```
!R! RES;
SFNT 'Swiss742SWC-Roman', 10, 2000;
SFNT 'Swiss742SWC-BoldItalic', 10, 2001;
SETF 1, 2000;
SETF 2, 2001;
MCRO BIBLIO;
ALTF 1; TEXT %1, E; TEXT " ", E;
ALTF 2; TEXT %2, E; TEXT " ", E;
ALTF 1; TEXT %3, N;
ENDM;
ALTF 1; TEXT 'BIBLIOGRAPHY',N,U;
TEXT,N;
CALL BIBLIO, "Engelberger, Joseph L., ",
"Robotics in Practice,", "Kogan Page";
CALL BIBLIO, "Cohen, J.,",
"Human Robots in Myth and Science,", "Allen and Irwin";
CALL BIBLIO, "McCorduck, Pamela,",
"Machines Who Think,", "W. H. Freeman and Company";
CALL BIBLIO, "Asimov, Isaac,",
"I, Robot,", "Doubleday & Co.";
EXIT;
```

Printout

BIBLIOGRAPHY

Engelberger, Joseph L., ***Robotics in Practice,*** Kogan Page
Cohen, J., ***Human Robots in Myth and Science,*** Allen and Irwin
McCorduck, Pamela, ***Machines Who Think,*** W. H. Freeman and Company
Asimov, Isaac, ***I, Robot,*** Doubleday & Co.

SFA — Set bitmap Font Attributes

Format

SFA *hmi*, *vmi*, *F/P* [, *rotation*, *sset*, *height*, *U/I*, *weight*, *typeface*][,*fonttype*];

Executable Parameters

hmi:

horizontal motion index; in a fixed font, the distance from the center of one character to the center of the next; in a proportionally spaced font, the width of the space character

vmi:

vertical motion index—the line-to-line spacing

F/P:

F=fixed spacing
P=proportional spacing

Non-executable Parameters

rotation:

0=normal
1=face-down
2=upside down
3=face-up (used in landscape mode)

sset:

symbol set (number from 0 to 65535):
4=ISO 60 Norway
5=Roman Extension
6=ISO 25 French*
7=HP German*
9=ISO 15 Italian
11=ISO 14 JIS ASCII*
14=ECMA-94 Latin 1
19=ISO 11 Swedish
21=ISO 6 ASCII
36=ISO 61 Norwegian*
37=ISO 4 U. K.

38=ISO 69 France
39=ISO 21 Germany
51=ISO 15 Spain*
53=US Legal
75=ISO 57 Chinese*
83=ISO 17 Spain
85=ISO 2 IRV*
115=ISO 10 Swedish*
147=ISO 16 Portuguese*
179=ISO 84 Portuguese*
211=ISO 85 Spanish*
277=HP Roman-8
305=PC Extension
341=IBM PC-8
373=IBM PC-8 (D/N)
405=IBM PC-850

* Available only with models FS-400/FS-1550/FS-3400 (each including type A)

height:

maximum height of the font

U/I:

U=upright
I=italic

weight:

degree of bolding, from -7 (light) to +7 (bold)

typeface:

0=Line Printer
1=Pica
2=Elite
3=Courier
4=Swiss 721
5=Dutch 801
6=Gothic
7=Script
8=Pret. Elite
9=Caslon
10=Orator

fonttype:

0=7-bit, 96 characters (character codes 32 to 127)
1=8-bit, 192 characters (character codes 32 to 127 and 160 to 255)
2=8-bit, 256 characters (All character codes. The printer must be set to the HP transparency mode. See *Chapter 6*.)

Function

The SFA command specifies the attributes of the current bitmap font. It can be used to change the default attributes of the bitmap font and will be ignored when the current font is a scalable font. The font retains its new attributes until they are changed by another SFA command or power is switched off. Font attributes are not reset by the RES command.

The SFA command has two types of parameters. The executable parameters adjust the intrinsic character and line spacing of the font. The non-executable parameters do not change the appearance of the font at all, but they affect the way in which the font is selected by word-processing software in the HP LaserJet emulation.

Executable Parameters
The first three parameters are required in every SFA command. The *hmi* parameter sets the character spacing of a fixed font or the word spacing of a proportional font. The *vmi* parameter adjusts the line spacing. The *vmi* and *hmi* parameters both use the unit value designated by the UNIT command.

The third parameter designates the font as fixed or proportional. Normally you should specify F for a fixed font (example: font 1) and P for a proportional font (example: font 2).

If the font mode (FTMD) value is 15, the assigned attributes take effect immediately. If the font mode value is less than 15, some of the attributes, although assigned to the font, will not take effect. If the font mode is 0 (the default value in the daisywheel emulation mode), none of the attributes will take effect.

Non-executable Parameters
The fourth and subsequent parameters of the SFA command are optional, although if one of these parameters is desired, then the preceding parameters must also be specified. The optional parameters are used to describe downloaded fonts for selection by embedded commands in the HP LaserJet emulation mode. The parameters can also redefine the attributes of resident fonts. However, they do not actually change the physical appearance of the font, only how the printer interprets the font's attributes.

The rotation parameter should be 0 for a portrait font or 3 for a landscape font. The values 1 and 2 are not normally used. You cannot change the orientation of a font with this parameter.

The symbol set parameter identifies the font's character set. Specifying this parameter does not actually change the character set. The height parameter is measured in the unit value designated by the UNIT command.

File

```
!R! RES; FTMD 15;
UNIT C; SLM 2; STM 4;
FONT 1; SFA .25, 1, F;
FONT 2; SFA .15, .5, P;
FONT 1;
EXIT;

At these settings, in
font mode 15, font 1 is
double spaced (1 cm),
!R! FONT 2; EXIT,E;
while font 2 is single
spaced (0.5 cm) with 1.5
mm spaces between words.

!R! FONT 1; EXIT,E;
The printer remembers
the spacing assigned
to each font.
```

Printout

```
At these settings, in

font mode 15, font 1 is

double spaced (1 cm),
```

while font 2 is single
spaced (0.5 cm) with 1.5
mm spaces between words.

```
The printer remembers

the spacing assigned

to each font.
```

SFNT — Select current FoNT by typeface

Format

SFNT *'typeface'* [, *height* [, *font-number* [, *symbol-set*, *compression*, *shear*]]];

Parameters

typeface:
Name of the typeface of the font to be selected.

height:
Height of the characters in points. The minimum value is 0.25 points and the maximum value is 999.75 points, in 0.25-point increments.

font number:
integer from 1000 to 65535

symbol-set:
Symbol set, number from 0 to 65535; Refer to LaserJet Symbol Sets in *Chapter 6*, page 6-47–51.

compression:
1 for normal character width. Smaller values for narrow characters; and larger values for wider characters. The minimum value is 0.3 and the maximum value is 3.

shear:
0 for normal (unitalicized) characters. Positive values give forward italicization; and negative values give backward italicization. The minimum value is -1 and the maximum value is 1.

Function

The SFNT command selects the font which matches the *typeface* parameters. It enables the user to size its height, assign a font number and vary some of the font attributes so that characters can appear compressed or sheared. All parameters except *typeface* are ignored if a bitmap typeface is specified.

By designating a font number for a scalable font, it can later be retrieved by using a FONT command. If you specify the symbol set, compression, and shear parameters together, the FONT command recalls the font with these effects intact.

Typeface should be a name from the font table in section 3.2. Specify the full name exactly as it appears in the table, including case sensitivity. This command is ignored and the current font is not changed if the typeface name is not in the table or is not typed correctly.

Height defines the size of the font, using the unit of points regardless of the current unit setting. The SFNT command is ignored if the *height* value is out of the range. If the *height* parameter is omitted, the printer sizes the font to the height of the current font. The following example displays a range of font heights.

You can assign any number from 1000 to 65535 as a temporary *font number*, as long as you do not duplicate the number of a bitmap font or a font number already in use. If the number matches one already assigned to another font, the printer ignores the SFNT command.

symbol-set uses HP PCL matching code to change the font's symbol set. Unsupported symbol set values, if specified, are ignored.

Compression squeezes or expands characters in the horizontal direction.

Compression = 0.3 Compression = 1 Compression = 3

Shear imparts a slant to the characters: forward if the angle value is positive; backward if it is negative. Zero gives upright characters.

Changes made with SFNT to a scalable font in its height, symbol set, compression, and shear remain effective until another font selection command is encountered. To retrieve this scalable font later, use the FONT command.

File

```
!R! RES; SPO P;
SFNT 'Swiss742SWC-RomanCondensed', 10, 3000, 277, 2, .3;
EXIT;
This is 10-point Swiss742SWC-RomanCondensed,
with Roman-8 symbol set, compression is 2, and
shear is .3. You can later recall this font by the
FONT 3000; command.
!R! PAGE; EXIT;
```

Printout

This is 10-point Swiss742SWC-RomanCondensed, with Roman-8 symbol set, compression is 2, and shear is .3. You can later recall this font by the FONT 3000; command.

SIMG — Set IMaGe model

Format

`SIMG` *operation-mode*`;`

Parameter

operation-mode:

Operation-mode	Source image	Pattern image
1	Transparent	–
2	Opaque	–
3	Transparent	Transparent
4	Transparent	Opaque
5	Opaque	Transparent
6	Opaque	Opaque

Function

The SIMG command sets the mode for controlling the transparency and opaqueness of an image and the current pattern when they are overlaid on each other.

In the table above, the *source image* can be a rectangular area, characters, or a raster graphics image preceded by an SIMG command. The fill patterns and gray shade rendered with the PAT, FPAT, and GPAT commands can be used for *pattern images*.

With operation modes 1 and 2, the SIMG command takes care of the source image's transparency only. The default operation mode is 1. The white pixels of the source image do not overlay on the destination. For example, you cannot pattern a character. With operation mode 2, the SIMG command applies the white pixels of the source image onto the destination directly.

SIMG=1

SIMG=2

The figure on the next page illustrates the effects of operation mode 3 through 6. In this example, the letter A represents the source image overlaid with the pattern image, while the two rectangles are referred to as the destination image.

operation-mode=3: Both the source image and pattern image are transparent. Since the source image is transparent, in the first example, the letter A is patterned and overlaid onto the destination image (two rectangles).

operation-mode=4: The source image is *transparent* and the pattern image is now *opaque*. The pattern's white pixels overlay the destination image in the shape of the letter A.

operation-mode=5: The source image is opaque and the pattern image is transparent. Being opaque, the source image (the letter A) as it is enclosed within a square comes overlaid onto the destination. The pattern image fills only the area on the destination which is covered by white pixels. Note that the letter A is patterned only with its opposing quarters.

operation mode=6: Both source and pattern images are opaque, the entire letter A is patterned, and the full source image is overlaid onto the destination.

Operation mode=1

Operation mode=2

Operation mode=3

Operation mode=4

Operation mode=5

Operation mode=6

File

```
!R! RES; UNIT C;
NEWP;
PMZP 5, 5;
PDRP 2.5, 0, 0, 2.5, -5, 0, 0, 2.5, 2.5, 0;
PAT 1; SIMG 4;
FILL 1;
MRP -1, 3.5; PAT 18;
FSET 4158T3B0S1P108V; TEXT ”A”;
FILL 1;
PAGE; EXIT;
```

Printout

SIR — Set Image Refinement level

Format

SIR *level*;

Parameters

level:

0= OFF (Ecoprint is off)
1= — (Light)
2= ON (Medium)
3= — (Dark)

Function

The SIR command accesses different levels of Kyocera Image Refinement (*KIR*). The image refinement level remains in effect until the printer receives a RES command or a different SIR command. The default value is the On (medium) level.

Refer to the *User's Manual* for details about how to obtain the optimum level of the image refinement.

File

```
!R! SIR 0; CMNT KIR is off; EXIT;
```

Printout

Omitted

Note: **Refer to the KIR item in the User's Manual for the printer.**

SLJN — Set Line JoiN

Format

`SLJN` *line-join mode*;

Parameter

line-join mode:

1=Beveled join
2=Mitered join
3=Round join
4=Notched join

Function

The SLJN command determines how two connected lines in a path are joined. The default join is *beveled* (1).

Beveled join ends the lines with butt caps (Refer to the SCAP command) and fills the larger angle between the lines with a triangle. *Mitered* join extends the edges of the lines until they touch. The current *miter limit* value affects this join type (Refer to SMLT command page). *Round* join connects lines with a circular join noted by a diameter equal to the width of the lines. *Notched* join enables the lines to overlap.

File

```
!R! RES; UNIT C;
NEWP;

SPD .5;
SCAP 3;
CMNT Round-capped at the upper-left corner;
SLJN 3;
CMNT Round-joined at other corners;
PMZP 5, 16.5;
PDRP 3, 0, 0, 3, -3, 0, 0, -3;
STRK;

NEWP;
SCAP 1;
CMNT Square-capped at the upper-left corner;
SLJN 2;
CMNT Mitered-joined at other corners;
PMZP 11, 16.5;
PDRP 3, 0, 0, 3, -3, 0, 0, -3;
STRK;

PAGE;
EXIT;
```

Printout

SLM — Set Left Margin

Format

`SLM` *distance*;

Parameter

distance:
size of left margin

Function

The SLM command sets the left margin, as measured from the left edge limit of the paper in the unit value designated by the UNIT command.

If the margin is moved to the right of the current cursor position, the cursor moves to the new margin.

When the left margin is moved to the right, the right margin does not change. But when the left margin is moved toward the left, the right margin moves with it, keeping a constant page width. To move the left margin to the left but leave the right margin in its original position, you must add an SRM command after the SLM command to restore the original right margin.

File

```
!R! RES; UNIT C; FONT 2;
SFNT ”Dutch801SWC-Roman”;
SLM 1;
EXIT;
Location of 1-cm left margin

!R! SLM 2; EXIT;
Location of 2-cm left margin

!R! SLM 3; EXIT;
Location of 3-cm left margin

!R! PAGE; EXIT;
```

Printout

Location of 1-cm left margin

Location of 2-cm left margin

Location of 3-cm left margin

SLPI — Set Lines Per Inch

Format

`SLPI` *number*;

Parameter

number:
Number of lines per inch

Function

The SLPI command sets the number of lines per inch (even if the UNIT command designates a non-inch unit).

Related Command

SLS

File

```
!R! RES; STM 2;
SFNT ”Swiss742SWC-Roman”;
EXIT;
These lines have the
default spacing of
six lines per inch.
!R! SLPI 2; EXIT;
These lines are
spaced at two lines
per inch.
!R! PAGE; EXIT;
```

Printout

These lines have the
default spacing of
six lines per inch.

These lines are

spaced at two lines

per inch.

SLPP — Set Lines Per Page

Format

SLPP *number*;

Parameter

number:
number of lines per page

Function

The SLPP command sets the bottom margin for an exact number of lines per page based on the current line spacing. As long as you do not change the line spacing or use Prescribe commands that move the cursor, you will get the specified number of lines per page.

To control the page size in terms of inches or centimeters instead of a number of lines, use the SBM (Set Bottom Margin) or SPL (Set Page Length) command. The advantage of the SLPP command is that it sets the bottom margin to accommodate an exact number of lines, so no excess is carried over to the next page.

A bottom margin setting in a document file should be placed at the beginning of the file or at a page break.

File

```
!R! RES; UNIT C;
SFNT ”Dutch801SWC-Roman”;
STM 1; SLS 1; SLPP 10;
EXIT, E;
Top margin at 1 cm, with 10 lines per page. (Line 1)
Line 2
Line 3
Line 4
Line 5
Line 6
Line 7
Line 8
Line 9
Line 10
Line 11
Line 12
!R! PAGE; EXIT;
```

Printout

Top margin at 1 cm, with 10 lines per page. (Line 1)

Line 2

Line 3

Line 4

Line 5

Line 6

Line 7

Line 8

Line 9

Line 10

Line 11

Line 12

SLS — Set Line Spacing

Format

SLS *distance*;

Parameter

distance:
Line-to-line spacing

Function

The SLS command sets the distance from the base of one line to the base of the next line. The distance is measured in the unit value designated by the UNIT command.

The line spacing can be set by either the SLS or the SLPI (set lines per inch) command. SLPI sets the number of lines per inch. SLS sets the number of inches (or other units) per line.

Related Command

SLPI

File

```
!R! RES; UNIT C; STM 5;
SFNT "Dutch801SWC-Roman";
EXIT;
These lines have the
default line spacing
of 0.423 cm (6 lpi).
!R! SLS .6; EXIT;
These lines are
spaced at intervals
of .6 centimeters.
!R! PAGE; EXIT;
```

Printout

These lines have the
default line spacing
of 0.423 cm (6 lpi).

These lines are
spaced at intervals
of .6 centimeters.

SMLT — Set Miter LimiT

Format

`SMLT` *limit-value*;

Parameter

limit-value:

Ratio of the length through a join to the width of line, expressed by the following formula (Default is 10. Minimum value is 1).

$$\text{limit-value} = \frac{\textit{miter length}}{\textit{line width}} = \frac{1}{\sin\left(\frac{a}{2}\right)}$$

Function

The *miter limit* value set by the SMLT command is the maximum ratio of the miter length through a join to the width of the lines connected to each other.

The default miter limit value is *10*. In smaller miter-limit values, say *3*, the miter join automatically switches to the beveled join. This switching prevents the problem of a spike extending beyond the intersection of the path because a small angle is used for the miter-join.

Related Commands

SLJN

File

```
!R! RES; UNIT C;
NEWP;
PMZP 5, 15;
SPD .5;
SLJN 2; CMNT Mitered join;
PDRP 1.5, -2, 1.5,  2, 1.5, -2,
     1.5,  2, 1.5, -2, 1.5,  2;
SMLT 10; CMNT Miter limit is 10;
STRK;

NEWP;
PMZP 5, 19;
SPD .5;
SLJN 2; CMNT Mitered join;
PDRP 1.5, -2, 1.5,  2, 1.5, -2,
     1.5,  2, 1.5, -2, 1.5,  2;
SMLT 1; CMNT Miter limit is 1;
STRK;

PAGE;
EXIT;
```

Printout

SPD — Set Pen Diameter

Format

SPD *diameter*;

Parameter

diameter:
Line thickness

Function

The SPD command sets the thickness of the line used in the graphics commands (DRP, PDRP, etc.). The thickness is specified in the unit value designated by the UNIT command. The maximum thickness is 4200 dots (14 inches or 35.56 centimeters) in path graphics mode, and 127 dots (0.42 inches or 1.08 centimeters) in standard graphics mode. The minimum thickness is 1 dot (about 0.01 centimeters or 0.0033 inches). The printer rounds off all decimal values to the nearest integer value.

The SPD command affects graphics segments created by DZP, DAP, DRP, DRPA, BOX, CIR, and PIE commands. It also affects the width of the line and curve segments stroked as paths.

A slant line drawn by the standard graphics commands becomes thicker than specified by the SPD command. The effect may be most noticeable with a 45° slant. In the path mode graphics, however, the thickness of any slant lines is automatically adjusted so that the slant lines are maintained in constant thickness as specified by SPD. (See next page.)

File

```
!R! RES; UNIT C; STM 2; SLM 2; SLS .6;
SFNT "Swiss742SWC-RomanCondensed";
SPD 0.01; DRP 5, 0; TEXT ' 0.01 cm', N;
SPD 0.02; DRP 5, 0; TEXT ' 0.02 cm', N;
SPD 0.05; DRP 5, 0; TEXT ' 0.05 cm', N;
SPD 0.1; DRP 5, 0; TEXT ' 0.1 cm', N;
SPD 0.2; DRP 5, 0; TEXT ' 0.2 cm', N;
PAGE; EXIT;
```

Printout

SPL — Set Page Length

Format

SPL *length*;

Parameter

length:
Distance from top margin to bottom margin

Function

The SPL command sets the bottom margin, as measured from the top margin position in the unit value designated by the UNIT command.

If an attempt is made to print below the bottom margin, the characters are printed on the next page.

A page length setting in a document file should be placed at the beginning of the file or at a page break.

The SBM (Set Bottom Margin) and SLPP (Set Lines Per Page) commands also set the bottom margin.

File

```
!R! RES; UNIT C;
SFNT ”Dutch801SWC-Roman”;
STM 1; SLS 1; SPL 10;
EXIT, E;
Top margin at 1 cm, with 10 cm page length. (Line 1)
Line 2
Line 3
Line 4
Line 5
Line 6
Line 7
Line 8
Line 9
Line 10
Line 11
Line 12
!R! PAGE; EXIT;
```

Printout

Top margin at 1 cm, with 10 cm page length. (Line 1)

Line 2

Line 3

Line 4

Line 5

Line 6

Line 7

Line 8

Line 9

Line 10

Line 11

Line 12

SPO — Set Page Orientation

Format

SPO *orientation;*

Parameter

orientation:

P=portrait (upright)
L=landscape (lengthwise)

Function

The SPO command instructs the printer how to orient the page, laying text and graphics on the page in a vertical direction (portrait orientation) or a horizontal direction (landscape orientation).

When the orientation is changed, the margins are adjusted so that they remain the same distance from the four edges of the paper (provided cassette paper is being used). See the illustration.

If the printer cannot adjust the margins as described above, it sets them to the edge limits. For example, if you set a top portrait margin greater than the paper width, then switch to landscape orientation, the printer resets the top margin to zero.

The printer uses separate bitmap fonts for portrait and landscape orientations. When the font mode (FTMD) is 8 or higher, as it is in the IBM, Epson, and LaserJet III/4/4 Plus emulations, the printer automatically sets the correct page orientation each time a new font is selected. Outside of the FTMD range, the printer will not change orientation with a change in fonts. After using the SPO command, remember to select a font with the new orientation.

The orientation can be changed without starting a new page, as in the example below. It should be noted, however, the printable areas in portrait and landscape orientations are not symmetrical because the edge limits in each orientation are not identical. See page 1-8 for details.

File

```
!R! RES;
SFNT 'Dutch801SWC-Italic', 10;
CMNT This file is for an A4 cassette.;
SPSZ 8;
PAT 16, 300;
UNIT C;
MZP 4, 24; BOX 6, –6;
MZP 7, 24; BOX 3, –3; BLK 3, –3;
MZP 4, 24;
TEXT, L;
TEXT 'Portrait orientation';
SPO L;
MZP 12, 10; BOX 6, –6;
MZP 15, 10; BOX 3, –3; BLK 3, –3;
MZP 12, 10;
TEXT, L;
TEXT 'Landscape orientation';
PAGE;
EXIT;
```

Printout

Landscape orientation

Portrait orientation

SPSZ — Set Paper SiZe

Format

SPSZ *size-code* [, *enlargement/reduction ratio*];

Parameters

size-code:

0 = Same as the size of the paper cassette
1 = Monarch (3-7/8 × 7-1/2 inches)*
2 = Business (4-1/8 × 9-1/2 inches)*
3 = International DL (11 × 22 cm)*
4 = International C5 (16.2 × 22.9 cm)*
5 = Executive (7-1/4 × 10-1/2 inches)*
6 = US Letter (8-1/2 × 11 inches)
7 = US Legal (8-1/2 × 14 inches)
8 = A4 (21.0 × 29.7 cm)
9 = JIS B5 (18.2 × 25.7 cm)
10 = A3 (29.7 × 42 cm)
11 = B4 (25.7 × 36.4 cm)
12 = US Ledger (11 × 17 inches)
13 = A5 (14.8 × 21 cm)
14 = A6 (10.5 × 14.8 cm)*
15 = JIS B6 (12.8 × 18.2 cm)
16 = Commercial #9 (3-7/8 × 8-7/8 inches)*
17 = Commercial #6 (3-5/8 × 6-1/2 inches)*
18 = ISO B5 (17.6 × 25 cm)
19 = Custom (11.7 × 17.7 inches)**
30 = C4 (22.9 × 32.4 cm)**
31 = Hagaki (10 × 14.8 cm)**
32 = Ofuku-Hagaki (14.8 × 20 cm)**

* These values may not be used if the *enlargement/reduction ratio* is specified.

** Some printers do not support all of these paper sizes. Refer to the User's Manual for the printer.

Enlargement/reduction ratio (for printers that handle A3-size paper):

0 = 100% [Cassette size to cassette size]
4 = 61% [A3 to JIS B5, B4 to A5]
5 = 70% [A3 to A4, B4 to JIS B5, A4 to A5]
6 = 81% [B4 to A4, B5 to A5]
7 = 86% [A4 to JIS B5]
8 = 94% [A4 to letter]
9 = 98% [Cassette size to cassette size × 98%]
20 = 115% [JIS B5 to A4, B4 to A3]
21 = 122% [A5 to JIS B5, A4 to B4]
22 = 141% [A4 to A3, letter to ledger, JIS B5 to B4, A5 to A4, B6 to JIS B5]
23 = 163% [B6 to A4, JIS B5 to A3]

Function

The SPSZ command sets the paper edge limits to the dimensions of a standard paper size, allowing for a 5 mm border of all sides. The margins are set to the edge limits. This command is particularly useful for printing on envelopes (size-codes 1 through 4, 16, and 17). If the size-code is 0, the printer adjusts the edge limits to match the cassette size. The size-code defaults to 0 at power-up and after a reset.

Size codes 10 through 12, 19, and 30 are supported only by the printer model that handles the A3 size paper.

If your printer model supports the A3 size paper, the *enlargement/reduction ratio* parameter controls reduction and enlargement of printing a page sized by the size-code parameter. Although the enlargement/reduction ratio parameter is optional, an enlargement/reduction ratio setting remains effective until an SPSZ command with new enlargement/reduction ratio specified or a reset command is encountered.

Note that the enlargement/reduction parameter is ignored unless the source paper size and the cassette paper size does not match.

The SPSZ command causes a page break, so it should be placed at the top of a file or program, or at the beginning of a new page.

Files

```
!R! CMNT Size the page as Monarch; SPSZ 1;
EXIT;
```

```
!R! CMNT Size the page as A3 and reduce it to A4;
    SPSZ 10, 5;
EXIT;
```

```
!R! CMNT Size the page as letter and reduce it to
    98%; SPSZ 6, 9;
EXIT;
```

Printout

Omitted

SPW — Set Page Width

Format

`SPW` *width*;

Parameter

width:
Width of page, from left margin to right margin

Function

The SPW command sets the right margin, as measured from the left margin position in the unit value designated by the UNIT command.

If an attempt is made to print beyond the right margin, the characters are printed on the next line in the IBM and Epson emulation modes and discarded in the other emulations.
The SRM (Set Right Margin) command also sets the right margin, but it measures from the left edge limit of the paper.

Related Command

SRM

File

```
!R! RES; UNIT C; SLM 1;
CMNT Emulation mode is 1 (IBM);
SFNT ”Swiss742SWC-RomanCondensed”, 18; SLPI 4;
SPW 10;
EXIT;
Line with 1-cm left margin and 10-cm width

!R! SPW 8; EXIT;
Line with 1-cm left margin and 8-cm width

!R! SPW 6; EXIT;
Line with 1-cm left margin and 6-cm width

!R! PAGE; EXIT;
```

Printout

Line with 1-cm left margin and 10-cm width

Line with 1-cm left margin and 8-cm width

Line with 1-cm left margin and 6-cm width

SRM — Set Right Margin

Format

SRM *width*;

Parameter

width:
Size of right margin

Function

The SRM command sets the right margin, as measured from the left edge limit of the paper in the unit value designated by the UNIT command.

If an attempt is made to print beyond the right margin, the characters are printed on the next line in the IBM and Epson emulation modes and discarded in the other emulations.

The SPW (Set Page Width) command also sets the right margin, but it measures from the left margin position.

Related Command

SPW

File

```
!R! RES; UNIT C; SLM 1;
CMNT Emulation mode is 1 (IBM);
SFNT ”Swiss742SWC-RomanCondensed”, 18; SLPI 4;
SRM 11;
EXIT;
Line with 1-cm left margin and 11-cm right margin

!R! SRM 9; EXIT;
Line with 1-cm left margin and 9-cm right margin

!R! SRM 7; EXIT;
Line with 1-cm left margin and 7-cm right margin

!R! PAGE; EXIT;
```

Printout

Line with 1-cm left margin and 11-cm right ma
rgin

Line with 1-cm left margin and 9-cm
right margin

Line with 1-cm left margin
and 7-cm right margin

SRO — Set Raster Options

Format

SRO *presentation-mode* [, *width*, *height*];

Parameters

presentation-mode:
0=physical raster direction
1=logical page direction

width:
width of raster area in dot; min. 1 to max. 4200 dots

height:
height of raster area in dot; min. 1 to max. 4200 dots

Function

The SRO command specifies the *presentation mode* which defines the orientation of the raster image. If the presentation mode is *0* (default), the printer creates the raster image along the width of the physical page regardless of the current page orientation. With the presentation mode *1*, however, the raster graphics prints in the orientation of the logical page. Presentation modes 0 and 1 are depicted in next page.

The *width* and *height* options define the size of the raster area which has the current position as its left-top corner of the area. These options are measured in the dot unit regardless of the current designation of the UNIT command.

Raster data extending beyond the border along the width of the raster area is clipped in the increment of dot.

After a RVRD command sequence finishes, the current position is moved down by 1/300 inch.

File

Presentation-mode = 0
The width and height of the raster area are defined based on the physical page regardless of the current page orientation. The current page orientation affects the position of the current point, however.

Landscape (SPO L;)

Portrait (SPO P;)

Presentation-mode = 1
The orientation of the logical page determines the width and height of the raster image. The current position also depends on the current page orientation.

Landscape (SPO L;)

Portrait (SPO P;)

```
!R! SPO L; SRO 0; STR 75;
RVRD; 2;A|0; 2;GG0; 2;^S<; 2;~{>;
      2;^S<; 2;GG0; 2;A|0; ENDR;
PAGE; EXIT;
```

Printout

Omitted

SROP — Set Raster OPeration

Format

SROP *value*;

Parameter

Value:

ROP3 value = 0 to 255

Function

The SROP command sets the raster operation in conjunction with the SIMG command.

This command cannot be specified for DAP, DRP, DRPA, DZP, BOX, BLK, CIR, ARC, or PIE. This command cannot be specified for images in dot-matrix printer emulations.

Raster operation is reset to the default of 252 by the RES command.

An error results and this command has no effect if the ROP3 value is outside the range 0 to 255.

File

```
!R!
dam;
res;

mcro dbox;
newp;
pmrp0,0;
pdrp0.5,0;
pdrp0,0.5;
pdrp-0.5,0;
clsp;
srop252;
gpat0;
fill;
newp;
pmrp0.2,0.2;
pdrp0.5,0;
pdrp0,0.5;
pdrp-0.5,0;
clsp;
srop%1;
pat25;
fill;
mrp0.8, -0.2;
endm;

mcro trop;
mzp0,2;
call dbox,0;
call dbox,1;
call dbox,2;
call dbox,3;
call dbox,4;
call dbox,5;
call dbox,6;
call dbox,7;
call dbox,8;
call dbox,9;
call dbox,10;
call dbox,11;
call dbox,12;
call dbox,13;
```

```
call dbox,14;
call dbox,15;

res; exit;
```

SSTK — select Sorter STacKer

Format

`SSTK [`*tray*`, `*tray*`, ...]; or SSTK 0;`

Parameter

tray:
number from 1 to the maximum (bottom)

Function

The SSTK command is effective only when the optional sorter is installed to the printer. It instructs the printer to deliver printed pages in the sorter mode. Each specified tray receives a complete set of pages, one copy of each.

If the parameters are omitted, the top *n* trays are used, where *n* is the copy count (equal or less than the number of trays). If you specify the copy count which is greater than the number of the trays being selected, the bulk tray receives the overflowed pages. If the tray parameters are specified, the COPY command is unnecessary as the printer automatically makes the copy count to be the same as the number of the tray parameters specified.

Upon receiving the SSTK command, the printer automatically performs a page feed.

If the parameter is 0 for SSTK (SSTK 0;) this command disables sorting and delivers all pages to the bulk output tray (SO-6).

File

```
!R! RES; SSTK 1, 3, 5; EXIT;
Three copies of this file will be printed.
The output goes to sorter trays 1, 3, and 5.
!R! PAGE; EXIT;
If the tray parameters were omitted (SSTK;
COPY3;), sorter trays 1, 2, and 3 would be used.
!R! PAGE; EXIT;
```

Printout

Omitted

STAK — select paper STAcKer

Format

STAK *stacker*;

Parameter

stacker:

1 = printer's face-down paper tray
2 = face-up paper tray of the printer or the stacker
3 = face-down paper tray of the optional stacker

Function

The STAK command instructs the printer to deliver pages to the face-up tray or face-down tray of the printer or the optional stacker. The selected tray remains in effect until changed by another STAK command. The default value is 1: the printer's face-down tray.

If an optional stacker (HS-3, ST-30, DF-30, DF-31, etc.) is installed, the value *2* instructs the printer to deliver printed pages to the stacker's face-up tray; the value *3* delivers the pages to the stacker's (or the sorter's) face-down tray.

The STAK command should be placed at the top of a file or program.

File

```
!R! STAK 2; EXIT;
PAGE 1
On printers with only one paper tray this file
will be delivered face-down as usual, page 1
first.
!R! PAGE; EXIT;
PAGE 2
PAGE 2 next, and so on, stacking in the correct
order.
!R! PAGE; EXIT;
PAGE 3
But on printers with two paper trays this file
will be delivered to the face-up tray with the
pages in reverse order, page 3 on top.
!R! PAGE; EXIT;
```

Printout

Omitted

STAT — STATus

Format

STAT [*mode*];

Parameter

mode:

0 = prints a user status page (default)
1 = prints a service person status page

Function

The STAT command instructs the printer to print a page of status information, starting on a new page. The status page lists the software version and release date as well as the following information:

- The current unit (inches, centimeters, points, or dots; not available in KPDL mode)
- The current page orientation, font, and country code (not available in KPDL mode)
- Current margins, line spacing, character spacing, and graphics line width, as measured in the current unit (not available in KPDL mode)
- Current memory allocations

The above status settings are temporary conditions set by Prescribe commands. They revert to their default values when power is switched off. Other status page information includes:

- Miscellaneous status: a list of options stored in permanent memory. See *Chapter 5* for the definitions of the option values. These values do not change when power is switched off. Only the FRPO command can alter them.

- Service information to inform an authorized Kyocera service person.

- Nonresident fonts in memory: Fonts generated by the LDFC command, downloadable soft fonts from software or read from a memory card. Font size and numbers appear alongside the font name. These fonts are lost when power is switched off.

Note: **Items and values on the status page may vary among the printer's firmware versions.**

Depending on the parameters, different information may be printed on the status page. (There are two types of status pages: one intended for the end user, and one intended for service personnel.) Also, the printer can print the status page in different languages in accordance with the language setting of the printer's control panel. The default is the English status page.

Sample Status Page

▪ User status page

KYOCERA ECOSYS™ Page Printer

STATUS PAGE

Software version: Released:

Hardware Information

MP Tray	A4	Plain
*Cassette 1	A4	Plain

Ecoprint mode	OFF
Buzzer control	ON
Host buffer size	60 KB
Sleep timer	30 Minutes
FF time out	30 Seconds

Page Information

Resolution	600 DPI
Copies	1
Total page	209

Memory

Standard memory	4096 KB
Option memory	
Slot 1	Empty
Total	4096 KB
User available	845 KB
RAM disk	OFF
Write protect	-
Total	0 KB
User available	0 KB

Installed Options

Option EP-ROM	NO
Memory card	NO

Emulation

Line printer
IBM Proprinter
Diablo 630
Epson LQ-850

▪ Service status page

KYOCERA **PAGE PRINTER STATUS PAGE** ECOSYS™

Software version: Released:

Standard setting

Interfaces	Unit
	*Inch
*Parallel	Centimeter
	Dots
Copies	Points
1	**Page orientation**
	*Portrait
	Landscape

Emulation

Line printer
IBM Proprinter
Diablo 630
Epson LQ-850
*PCL 6
KPDL2

Paper

Feeder	Size	
MP Tray	A4	01
*Cassette 1	A4	01

Margin

Top	0.333
Bottom	11.023
Left	0.500
Right	7.793

Memory

Total	4096 KB
User available	1433 KB

Font

1byte code
1

Interface independent parameters

Environment	Parameters	
Reserved	B0	00
Default pattern switch	B8	00
Serial line control	D0	00
Reserved	D1	00
	D2	01
	D3	00
		01

Interface dependent parameters

Environment	Parameters	Parallel
User top margin	A1+A2/100	00.00
User left margin	A3+A4/100	00.00
User page length	A5+A6/100	13.61
User page width	A7+A8/100	13.61
Page orientation	C1	00
Default font number	C2.C3.C5 *1	00000
PCL font switch	C8	00
release timeout	J2	06
parallel I/O	o0/o1/o2	01/01/02
tion	P1	06
	P2/P3	01/01
	P4/P5	00/06
		02/02
		06.00

STM — Set Top Margin

Format

STM *distance*;

Parameter

distance:
Size of top margin

Function

The STM command sets the top margin, in the unit value designated by the UNIT command.

A top margin setting in a document file should be placed at the beginning of the file or at a page break.

If the top margin is moved below the current cursor position, the cursor moves to the new margin. But if the top margin is moved above the current cursor position, the cursor does not move.

File

```
!R! RES; UNIT C;
SFNT ”Swiss742SWC-RomanCondensed”, 18;
STM 2;
EXIT, E;
First page with 2-cm top margin

!R! RES; UNIT C;
SFNT ”Swiss742SWC-RomanCondensed”, 18;
STM 4;
EXIT, E;
Second page with 4-cm top margin

!R! PAGE; EXIT;
```

Printout

First page with 2-cm top margin

Second page with 4-cm top margin

STPC — set STaPle Counter

This command is an MPS command.

Function

Sets the number of sheets to be stapled.

For a detailed explanation of this command, refer to Chapter 7, “Prescribe Commands for MPS Management.”

STPL — STaPLe option

This is an MPS command.

Function

This commmand staples the pages of a job.

For a detailed explanation of this command, refer to Chapter 7, “Prescribe Commands for MPS Management.”

STR — SeT dot Resolution

Format

STR *dot resolution*;

Parameter

dot resolution:
75, 100, 150, 200, 300, 600, or 1200

Function

The STR command sets the dot resolution for raster graphics to 75, 100, 150, 200, 300, or 600 dots per inch. The 200, 600, and 1200 dpi resolutions are available only for the printer models that support the 600 or 1200 dpi printing resolution. The default value is 75 dots per inch.

The STR command affects only Prescribe raster graphics. It does not change the resolution of vector graphics commands or HP LaserJet raster graphics.

75 dpi resolution (Default) | 100 dpi resolution | 150 dpi resolution | 200 dpi resolution | 300 dpi resolution | 600 dpi resolution | 1200 dpi resolution

STRK — STRoKe current path

Format

STRK;

Parameter

None

Function

The STRK command strokes the constructed path onto the current page according to the following current graphics state:

Pen diameter
Dash pattern
Fill pattern
Line cap
Line join
Flatness

A path itself will not place a line or graphic on a page because Prescribe path-construction commands only define the path. For the path to be drawn or filled as a line, box, character, etc., on the page, the STRK command must be issued.

After stroking the current path, the STRK command clears the path and moves the cursor to the end of the path.

Related Commands

FILL, NEWP

File

```
!R! RES; UNIT C;

NEWP;
PMZP 7, 17;
SPD .2;
PDRP -2.5, 0, 0, 2.5, 2.5, 0, 0, -2.5;
PDRP 2.1, 1.25, 1.25, -2.1, -2.1, -1.25, -1.25, 2.1;
PMRP 0, 2.5;
PDRP 2.1, -1.25, 1.25, 2.1, -2.1, 1.25, -1.25, -2.1;
STRK;

PAGE;
EXIT;
```

Printout

SULP — Set UnderLine Parameters

Format

SULP *distance*, *thickness*;

Parameters

distance:
distance below the baseline

thickness:
thickness of the underline

Function

The SULP command sets the thickness of any subsequent underlining as well as the distance below the baseline, in the unit value designated by the UNIT command. The distance parameter is limited only by the size of the page. Negative values can be used to obtain overlines.

The minimum underline thickness is one dot. The maximum underline thickness is 127 dots. The default values include:

Distance below baseline: 7 dots
Thickness of underline: 4 dots
One dot equals approximately 0.0083 cm or 0.0033 inches.

The SULP command does not affect the underline character (_), which is an independent character with ASCII code 95 (hex 5F). If your word-processing software writes underlines by backing up and printing the underline character instead of using the printer's automatic underline feature, the SULP command will control only underlines printed by the U-option in Prescribe commands such as TEXT.

File

```
!R! RES; UNIT C; SLS 0.8;
SFNT 'Swiss742SWC-RomanCondesed', 12;
TEXT 'Default paramaters', E, U; TEXT ', ', E;
SULP .2, .1;
TEXT 'heavier underlining', N, U;
TEXT 'and even ', E;
SULP -.32, .04;
TEXT 'OVERLINING', E, U;
TEXT '!';
PAGE;
EXIT;
```

Printout

Default parameters, heavier underlining

and even OVERLINING!

TEXT — print TEXT

Format

`TEXT ['string'][,option][,U-option];`

Parameters

string:
any character string

option:
B=Leave cursor at beginning of string
E=Move cursor to end of string
L=Move cursor down one line
N=Move cursor to beginning of next line

U-option:
Underline text

Function

The TEXT command prints the given string at the cursor location, then moves the cursor as designated by the option. The string to be printed must be enclosed in either single or double quotation marks. (If the string includes one kind of quotation mark, use the other kind to enclose it.) If the string is omitted, nothing is printed. `TEXT, N;` can be used to print a blank line, for example. If the option is omitted, the cursor is not moved (same as option B). If the U-option is specified, the string is underlined. The underline thickness and location can be set by the SULP command.

The TEXT command can be used to position a line of text at an exact location.

The length of the string is unlimited, except that the command as a whole may not be longer than 255 characters. Carriage-return and linefeed codes in the string are ignored.

Related Commands

CTXT, RTXT

File

```
!R! RES; UNIT; MAP 2, 2;
SFNT 'Swiss742SWC-RomanCondensed';
TEXT 'Check desired options:', L, U;
FONT 2;
BOX .1, -.1; TEXT ' Power steering', L;
BOX .1, -.1; TEXT ' CD auto changer', L;
BOX .1, -.1; TEXT ' Air conditioner', L;
PAGE;
EXIT;
```

Printout

Check desired options:

- ▫ Power steering
- ▫ CD auto changer
- ▫ Air conditioner

TPRS — Text PaRSing method

Format

TPRS *mode*;

Parameter

mode:

0 = ANK mode (1-byte code)
1 = Shift JIS mode (2-byte code)

Function

If the current font supports 2-byte characters and a 2-byte symbol set such as Windows 3.1J (19K), the TPRS command allows 2-byte characters to be parsed according to the specified parsing mode and output whenever printing using a text command.

The only emulation for which this command is currently valid is the HP emulation. The pursing method will automatically be Shift JIS encoding if the default font and symbol set is of 2-byte.

An error results and this command has no effect if parameters other than the above are used.

UNIT — set UNIT of measurement

Format

`UNIT` *code*;

Parameter

code:

I=inches
C=centimeters
P=points
D=dots

Function

The UNIT command sets the unit of measurement used in other Prescribe commands.

The initial unit is inches. Other supported units of measurement can be calculated as follows:

1 inch=2.54 centimeters
1 inch=72 points
1 inch=300 dots (300 dpi)/600 dots (600 dpi)/1200 dots (1200 dpi)

UNIT commands are not retroactive. They do not affect values set by previous commands.

File

```
!R! UNIT C; MRP 3, 3;
SFNT ”Swiss742SWC-RomanCondensed”;
MRP 3, 3;
CIR .35;
TEXT ’       7mm pistol’;
UNIT I; MRP 0, 1;
CIR .225;
TEXT ’       .45 caliber pistol’;
PAGE;
EXIT;
```

Printout

UOM — Unit Of Measurement

Format

UOM *number*;

Parameter

number:

one of the following numbers:
96, 100, 120, 144, 150, 160, 180, 200, 225, 240, 288, 300, 360, 400, 450, 480, 600, 720, 800, 900, 1200, 1440, 1800, 2400, 3600, 7200

The UOM command applies only to the printer models that support the 600 dpi resolution. It defines the unit of measurement in dots per inch for cursor movements. The command requires that the unit value be set to D.

The default unit of measurement is 300 (dpi). For example, the cursor movement of 50 dots equals 1/6 inches.

The command accepts only the above numbers for the unit of measurement. Any other numbers will be ignored when used with this command.

Related Command

UNIT

File

```
!R! FRPO N8, 1; RES;
UNIT C;
SFNT "Swiss742SWC-RomanCondensed", 9;

MZP 5, 5;
TEXT "UOM 120; BOX 100, 100;", L;
UNIT D;
UOM 120;
BOX 100, 100;

UNIT C;
MZP 5, 9;
TEXT "UOM 720; BOX 100, 100;", L;
UNIT D;
UOM 720;
BOX 100, 100;

PAGE; EXIT;
```

Printout

UOM 120; BOX 100, 100;

UOM 720; BOX 100, 100;

VMAL — set Virtual MAiL box alias

This is a Virtual Mail Box command.

Function

The VMAL command adds or changes the name for a Virtual mail box tray as desired.

For a detailed explanation of this command, refer to Chapter 9, "VMB Operation Commands."

VMPW — set Virtual Mail box Pass Ward

This is a Virtual Mail Box command.

Function

Sets the output password for a virtual mail box tray. (This is the locked mailbox function.)

For a detailed explanation of this command, refer to Chapter 9, “VMB Operation Commands.”

WRED — WRite EnD

Format

```
WRED;
```

Parameter

None

Function

The WRED command terminates writing to the memory card. Alternatively, you can terminate writing by pressing the FORM FEED key on the printer's front panel. (This command applies only to the models that support writing to a memory card.)

Related command

ICCD

XPAT — generate eXpanded fill PATtern

Format

XPAT *pattern-number*, *bit map*;

Parameters

pattern-number:
number from 100 to 105

bit map:
dot pattern of the pattern, coded as a character string

Function

The XPAT command generates a new, expanded shading pattern. The new pattern can be specified with the PAT command for use by the BLK and ARC commands and in a path.

Details for creation of new patterns appear in *Chapter 3*.

Related Commands

PAT, BLK, ARC

File

```
!R! RES; UNIT C; MAP 5, 5;
XPAT 105;//?//?p@0p@0p@0p@0p@0p@0p@0p@0p@0p@0p@0p@0p@0p@0;
PAT 105; BOX 4, 1; BLK 4, 1;
PAGE;
EXIT;
```

Printout

Chapter 3

Fonts

This chapter covers font-related topics, including the printer's resident and option fonts, character sets, and usage of font-selection and symbol creation commands.

3.1. Bitmap and Scalable Fonts

A font is a set of characters of a particular design. The design is referred to as a *typeface*. Several characteristics identify a font. These include the font type (bit map or scalable), symbol set, spacing, pitch, height, style, stroke weight, and typeface family.

The printer provides two types of resident fonts: **bitmap fonts** and **scalable** (outline) **fonts**. Also, fonts may be downloaded to the printer's memory from a memory card or floppy disk. These fonts are referred to as *downloadable* or *soft* fonts. The printer accepts as many downloadable fonts as user memory allows.

When the HP LaserJet emulation is the printer's default emulation mode, the power-up (default) font is ordinarily font #1 (**12-point Courier**). A different default bitmap font can be selected by using the **FRPO** (Firmware RePrOgram) command with parameters (C2, C3, and C5). To make a scalable font the default font, change the settings of parameters V0-V3. For details, refer to *Chapter 5*.

For printer models that support 600 dpi resolution printing, all resident fonts, either bitmap or scalable, can print at both 300-dpi and 600-dpi resolutions.

Bitmap Fonts

A bitmap font is made of a fixed bit pattern as shown on the next page. This pattern is stored in a special format for use by the printer. Bitmap fonts have the fixed height (size) for each character. Therefore, different font sets are required for different font sizes.

For example, Dutch801BM10-Roman means a Dutch 801 style bitmap font of 10-point and Roman-style. Remember that **Roman** means the medium weight typeface. Other options include weights for **bold** and *italic*.

Bitmap font character

Scalable Fonts

Scalable fonts provide an outline of characters which can be sized according to sizing information for the font. These fonts can be scaled from 0.25 to 999.75 points in quarter point increments.

For example, Swiss742SWC-Bold means a Swiss 742 style scalable font with bold weight.

Scalable font character

3.2. List of Fonts

This section displays a chart of the printer's resident fonts. To print a full list of resident fonts, use the printer's control panel key or the FLST command.

Resident Bitmap Fonts

The following chart lists the printer's resident bitmap fonts. Note the difference in font numbers for portrait and landscape orientations. Also, all resident bitmap fonts include the letters BM in the typeface name.

Font Name	Font Number		Height	Pitch
	Port.	Land.	(Pts.)	(cpi)
CourierBM12-Roman	1	17	12	10
CourierBM12-Italic	37	18	12	10
CourierBM12-Bold	38	67	12	10
CourierBM12-BoldItalic	39	68	12	10
Dutch801BM10-Roman	2	19	10	Prop.
Dutch801BM10-Italic	3	20	10	Prop.
Dutch801BM10-Bold	4	21	10	Prop.
Dutch801BM10-BoldItalic	40	69	10	Prop.
Dutch801BM8-Roman	5	22	8	Prop.
Dutch801BM8-Italic	41	—	8	Prop.
Dutch801BM8-Bold	42	70	8	Prop.
Dutch801BM8-BoldItalic	43	—	8	Prop.
PrestigeEliteBM10-Roman	6	23	10	12
PrestigeEliteBM10-Italic	44	24	10	12
PrestigeEliteBM10-Bold	45	71	10	12
PrestigeEliteBM10-BoldItalic	46	72	10	12
PrestigeEliteBM7.2-Roman	7	25	7.2	16.67
PrestigeEliteBM7.2-Italic	47	—	7.2	16.67
PrestigeEliteBM7.2-Bold	48	73	7.2	16.67
PrestigeEliteBM7.2-BoldItalic	49	—	7.2	16.67
LetterGothicBM12-Roman	8	26	12	12
LetterGothicBM12-Italic	50	27	12	12
LetterGothicBM12-Bold	9	28	12	12
LetterGothicBM12-BoldItalic	51	79	12	12
LinePrinterBM8.5-Roman (Available only on models with Agfa fonts)	88	—	8.5	16.67
Swiss721BM14.4-Bold	10	29	14.4	Prop.
Swiss721BM14.4-BoldItalic	52	—	14.4	Prop.

Font Name	Font Number		Height (Pts.)	Pitch (cpi)
	Port.	Land.		
Swiss721BM12-Bold	11	30	12	Prop.
Swiss721BM12-BoldItalic	53	—	12	Prop.
Swiss721BM10-Bold	12	31	10	Prop.
Swiss721BM10-BoldItalic	54	—	10	Prop.
Swiss721BM8-Roman	13	32	8	Prop.
Swiss721BM8-Italic	55	—	8	Prop.
Swiss721BM8-Bold	56	74	8	Prop.
Swiss721BM8-BoldItalic	57	—	8	Prop.
Swiss721BM6-Roman	14	33	6	Prop.
Swiss721BM6-Italic	58	—	6	Prop.
Swiss721BM6-Bold	59	75	6	Prop.
Swiss721BM6-BoldItalic	60	—	6	Prop.
LinePrinterBM9-Roman	15	34	9	16.67
LinePrinterBM9-Italic	61	35	9	16.67
LinePrinterBM9-Bold	62	76	9	16.67
LinePrinterBM9-BoldItalic	63	77	9	16.67
LinePrinterBM7-Roman	16	36	7	21.43
LinePrinterBM7-Italic	64	—	7	21.43
LinePrinterBM7-Bold	65	78	7	21.43
LinePrinterBM7-BoldItalic	66	—	7	21.43

Resident Scalable Fonts

The following list displays the scalable fonts resident for the FS-series printer models. These fonts including the letters SWC in the typeface name are equivalent to Intelli fonts; the fonts including the letters SWM are equivalent to the TrueType fonts.

Resident BitStream Fonts in the FS-series Printers

Font Name	FS-400/ 1550/3400 (13)	Other FS models (45)	Optional Font ROM FR-1 (46)
Dutch801SWC-Bold	Yes	Yes	
Dutch801SWC-BoldItalic	Yes	Yes	
Dutch801SWC-Italic	Yes	Yes	
Dutch801SWC-Roman	Yes	Yes	
Swiss742SWC-Bold	Yes	Yes	
Swiss742SWC-BoldCondensed	Yes	Yes	
Swiss742SWC-BoldCondensedItalic	Yes	Yes	
Swiss742SWC-BoldItalic	Yes	Yes	
Swiss742SWC-Italic	Yes	Yes	

Font Name	FS-400/ 1550/3400 (13)	Other FS models (45)	Optional Font ROM FR-1 (46)
Swiss742SWC-ItalicCondensed	Yes	Yes	
Swiss742SWC-Roman	Yes	Yes	
Swiss742SWC-RomanCondensed	Yes	Yes	
ZapfDingbatsSWC-Regular	Yes		
Incised901SWC-Black		Yes	Yes
Incised901SWC-Italic		Yes	Yes
Incised901SWC-Roman		Yes	Yes
OriginalGaramondSWC-Bold		Yes	Yes
OriginalGaramondSWC-BoldItalic		Yes	Yes
OriginalGaramondSWC-Italic		Yes	Yes
OriginalGaramondSWC-Roman		Yes	Yes
ZapfHumanist601SWC-Bold		Yes	Yes
ZapfHumanist601SWC-BoldItalic		Yes	Yes
ZapfHumanist601SWC-Demi		Yes	Yes
ZapfHumanist601SWC-DemiItalic		Yes	Yes
BenguiatSWC-Bold			Yes
BenguiatSWC-BoldItalic			Yes
BenguiatSWC-Book			Yes
BenguiatSWC-BookItalic			Yes
BodoniSWC-Bold			Yes
BodoniSWC-BoldItalic			Yes
BodoniSWC-Book			Yes
BodoniSWC-BookItalic			Yes
BookmanSWC-Demi			Yes
BookmanSWC-DemiItalic			Yes
BookmanSWC-Light			Yes
BookmanSWC-LightItalic			Yes
CenturySchoolbookSWC-Bold			Yes
CenturySchoolbookSWC-BoldItalic			Yes
CenturySchoolbookSWC-Italic			Yes
CenturySchoolbookSWC-Roman			Yes
ChiantiSWC-Bold			Yes
ChiantiSWC-ExtraBold			Yes
ChiantiSWC-Italic			Yes
ChiantiSWC-Roman			Yes
CooperSWC-Black			Yes
Incised901SWC-Compact			Yes
RevueSWC-Light			Yes
SouvenirSWC-Demi			Yes
SouvenirSWC-DemiItalic			Yes
SouvenirSWC-Light			Yes
SouvenirSWC-LightItalic			Yes
StymieSWC-Bold			Yes

Font Name	FS-400/ 1550/3400 (13)	Other FS models (45)	Optional Font ROM FR-1 (46)
StymieSWC-BoldItalic			Yes
StymieSWC-Medium			Yes
StymieSWC-MediumItalic			Yes
ZapfCalligraphic801SWC-Bold			Yes
ZapfCalligraphic801SWC-BoldItal			Yes
ZapfCalligraphic801SWC-Italic			Yes
ZapfCalligraphic801SWC-Roman			Yes
AudreyTwo-RegularSWC		Yes	
Clarendon-CondensedSWC		Yes	
Courier-BoldItalicSWC		Yes	
Courier-BoldSWC		Yes	
Courier-ItalicSWC		Yes	
Courier-SWC		Yes	
Dutch801-BoldItalicSWM		Yes	
Dutch801-BoldSWM		Yes	
Dutch801-ItalicSWM		Yes	
Dutch801-RomanSWM		Yes	
Flareserif821-ExtraBoldSWC		Yes	
Flareserif821-RomanSWC		Yes	
LetterGothic-BoldSWC		Yes	
LetterGothic-ItalicSWC		Yes	
LetterGothic-SWC		Yes	
MoreWingbats-RegularSWM		Yes	
Ribbon131-RomanSWC		Yes	
Swiss721-BoldObliqueSWM		Yes	
Swiss721-BoldSWM		Yes	
Swiss721-ObliqueSWM		Yes	
Swiss721-SWM		Yes	
Symbol-Set-SWM		Yes	
CourierBM10-Roman (Bitmap*, Port. and Land.)		Yes	
CourierBM10-Italic (Bitmap*, Port. and Land.)		Yes	
CourierBM10-Bold (Bitmap*, Port. and Land.)		Yes	
CourierBM10-BoldItalic (Bitmap*, Port. and Land.)		Yes	

Resident Agfa Fonts in the FS-series Printers

Font Name	Font Number
Courier	0
CGTimes	1
CGTimes-Bd	2
CGTimes-It	3
CGTimes-BdIt	4
CGOmega	5
CGOmega-Bd	6
CGOmega-It	7
CGOmega-BdIt	8
Coronet	9
Clarendon-Cd	10
Univers-Md	11
Univers-Bd	12
Univers-MdIt	13
Univers-BdIt	14
Univers-MdCd	15
Univers-BdCd	16
Univers-MdCdIt	17
Univers-BdCdIt	18
AntiqueOlive	19
AntiqueOlive-Bd	20
AntiqueOlive-It	21
GaramondAntiqua	22
Garamond-Hlb	23
Garamond-Krsv	24
Garamond-HlbKrsv	25
Marigold	26
Albertus-Md	27
Albertus-ExBd	28
Arial	29
Arial-Bd	30
Arial-It	31
Arial-BdIt	32
TimesNewRoman	33
TimesNewRoman-Bd	34
TimesNewRoman-It	35
TimesNewRoman-BdIt	36
Helvetica	37
Helvetica-Bd	38
Helvetica-Ob	39
Helvetica-BdOb	40
Helvetica-Nr	41
Helvetica-NrBd	42
Helvetica-NrOb	43

Font Name	Font Number
Helvetica-NrBdOb	44
Palatino	45
Palatino-Bd	46
Palatino-It	47
Palatino-BdIt	48
ITCAvantGardeGothic-Bk	49
ITCAvantGardeGothic-Dm	50
ITCAvantGardeGothic-BkOb	51
ITCAvantGardeGothic-DmOb	52
ITCBookman-Lt	53
ITCBookman-Dm	54
ITCBookman-LtIt	55
ITCBookman-DmIt	56
NewCenturySchoolbook-Rom	57
NewCenturySchoolbook-Bd	58
NewCenturySchoolbook-It	59
NewCenturySchoolbook-BdIt	60
Times-Rom	61
Times-Bd	62
Times-It	63
Times-BdIt	64
ITCZapfChancery-MdIt	65
Symbol	66
SymbolPS	67
Wingdings	68
ITCZapfDingbats	69
Courier-Bd	70
Courier-It	71
Courier-BdIt	72
LetterGothic	73
LetterGothic-Bd	74
LetterGothic-It	75
CourierPS	76
CourierPS-Bd	77
CourierPS-Ob	78
CourierPS-BdOb	79

Optional Fonts ROM

The additional 46 scalable and 8 bitmap fonts (FR-1) can be purchased as an option. This optional font installation requires a qualified service technician because a ROM chip, containing the optional fonts, must be placed on the printer's board. Ask your local dealer about font ROM option.

See the tables on the preceding pages for a full list of the optional fonts. Both the bitmap fonts and scalable fonts are included in one single font ROM.

KPDL Fonts

Kyocera printers have KPDL (Kyocera Printer Description Language) emulation capabilities. With KPDL emulation, you can use 47 fonts that are PostScript Level 2-compatible. Even if your printer does not have KPDL emulation capabilities, you can implement KPDL emulations by installing the PK-1/2/4 option in your printer.

With the printer in KPDL mode, a list of the KPDL fonts can be printed by using the Prescribe FLST command or from the printer's control panel. The KPDL fonts are identifiable with suffix **SWA**.

KPDL Outline Fonts

- ***Models with Resident BitStream Fonts***

Font Name	Total
Century-Schoolbook-BoldItSWA	47
Century-Schoolbook-BoldSWA	
Century-Schoolbook-ItalicSWA	
Century-Schoolbook-SWA	
Courier-BoldItalicSWA	
Courier-BoldSWA	
Courier-ItalicSWA	
Courier-SWA	
Dutch801-BoldItalicSWA	
Dutch801-BoldSWA	
Dutch801-ItalicSWA	
Dutch801-RomanSWA	
ITC-Avant-Garde-BookObliqueSWA	
ITC-Avant-Garde-BookSWA	
ITC-Avant-Garde-DemiObliqueSWA	
ITC-Avant-Garde-DemiSWA	
ITC-Bookman-DemiItalicSWA	
ITC-Bookman-DemiSWA	
ITC-Bookman-LightItalicSWA	
ITC-Bookman-LightSWA	
ITC-Garamond-BoldItalicSWA	
ITC-Garamond-BoldSWA	
ITC-Garamond-LightItalicSWA	
ITC-Garamond-LightSWA	
ITC-Korinna-BoldSWA	
ITC-Korinna-KursivBoldSWA	
ITC-Korinna-KursivRegularSWA	
ITC-Korinna-RegularSWA	
ITC-Zapf-Chancery-MediumItSWA	
ITC-Zapf-Dingbats-SWA	
Swiss721-BlackObliqueSWA	
Swiss721-BlackSWA	
Swiss721-BoldObliqueSWA	
Swiss721-BoldSWA	
Swiss721-LightObliqueSWA	
Swiss721-LightSWA	
Swiss721-NarrowBoldObliqueSWA	
Swiss721-NarrowBoldSWA	
Swiss721-NarrowObliqueSWA	
Swiss721-NarrowSWA	
Swiss721-ObliqueSWA	
Swiss721-SWA	
Symbol-Set-SWA	
Zapf-Calligraphic801-BoldItSWA	
Zapf-Calligraphic801-BoldSWA	
Zapf-Calligraphic801-ItalicSWA	
Zapf-Calligraphic801-SWA	

- ***Models with Resident Agfa Fonts***

Font Name	Total
Albertus-ExtraBold	80
Albertus-Medium	
AntiqueOlive	
AntiqueOlive-Bold	
AntiqueOlive-Italic	
Arial	
Arial-Bold	
Arial-BoldItalic	
Arial-Italic	
AvantGarde-Book	
AvantGarde-BookOblique	
AvantGarde-Demi	
AvantGarde-DemiOblique	
Bookman-Demi	
Bookman-DemiItalic	
Bookman-Light	
Bookman-LightItalic	
CGOmega	
CGOmega-Bold	
CGOmega-BoldItalic	
CGOmega-Italic	
CGTimes	
CGTimes-Bold	
CGTimes-BoldItalic	
CGTimes-Italic	
Clarendon-Condensed-Bold	
Coronet	
Courier	
Courier-Bold	
Courier-BoldOblique	
Courier-Oblique	
CourierPCL	
CourierPCL-Bd	
CourierPCL-BoldItalic	
CourierPCL-Italic	
Garamond-Antiqua	
Garamond-Halbfett	
Garamond-Kursiv	
Garamond-KursivHalbfett	
Helvetica	
Helvetica-Bold	
Helvetica-BoldOblique	
Helvetica-Narrow	
Helvetica-Narrow-Bold	
Helvetica-Narrow-BoldOblique	
Helvetica-Narrow-Oblique	
Helvetica-Oblique	
LetterGothic	
LetterGothic-Bold	
LetterGothic-Italic	

Font Name	Total
Marigold	80
NewCenturySchlbk-Bold	
NewCenturySchlbk-BoldItalic	
NewCenturySchlbk-Italic	
NewCenturySchlbk-Roman	
Palatino-Bold	
Palatino-BoldItalic	
Palatino-Italic	
Palatino-Roman	
Symbol	
Symbol MT	
Times-Bold	
Times-BoldItalic	
Times-Italic	
Times-Roman	
TimesNewRoman	
TimesNewRoman-Bold	
TimesNewRoman-BoldItalic	
TimesNewRoman-Italic	
Univers-Bold	
Univers-BoldItalic	
Univers-Condensed-Bold	
Univers-Condensed-BoldItalic	
Univers-Condensed-Medium	
Univers-Condensed-MediumItalic	
Univers-Medium	
Univers-MediumItalic	
Wingdings-Regular	
ZapfChancery-MediumItalic	
ZapfDingbats	

3.3. Font Selection

There are several ways to select the page printer's fonts: one way is to use the appropriate keys on the printer's control panel; a second way is to place a Prescribe 2e command in the file to be printed, as in the examples in *Chapters 1*; a third way is to select an FS-series printer driver within a software application. This third way is preferable because the fonts are integrated directly into the software. In the absence of this support, the user should read the following information on choosing and placing Prescribe commands.

Font Selection by Prescribe 2e Commands

The Prescribe 2e commands associated with font selection include:

- FONT (select current FONT by number)
- ALTF (select ALTernate Font) and SETF (SET alternate Font)
- SCF (Save Current Font) and RPF (Return to Previous Font)
- SCCS (Save Current Code Set) and RPCS (Return to Previous Code Set)
- FSET (change current Font SETting by characteristic)
- SFNT (Select current FoNT by typeface)
- CSET (Change current symbol SET)
- FTMD (set bitmap FonT MoDe)
- SFA (Set bitmap Font Attributes)

Most of these commands are applicable both with bitmap fonts and scalable fonts. The exceptions are the FTMD and SFA commands, which are only valid with bitmap fonts.

The following is a brief guide to the use of these commands.

Selecting Fonts with the FONT Command

When you print a document with just one bitmap font, or make only a few font changes, the simplest command to use is FONT.

Example:
To select font 8 (bitmap portrait LetterGothicBM12-Roman), use the following command sequence:

```
!R! FONT 8; EXIT;
```

To select a scalable font (which does not normally have the font number to use with a FONT command), you must take one extra step using the SFNT (Select FoNT by typeface) command. See *Selecting Fonts using the SFNT command* which follows.

If you select a bitmap font, a change in fonts can also affect the character spacing, line spacing, and page orientation. This depends on the *font mode* (**FTMD**). With bitmap fonts, setting the font mode to 15 enables the printer to adjust all these parameters automatically. When you select font 23 (landscape PrestigeEliteBM10-Roman), for example, the printer automatically changes the character spacing to 12 characters per inch, the line spacing to about 7.25 lines per inch, and the page orientation to landscape.

Remember that the font mode is only valid for bitmap fonts. Scalable fonts always adjust to the current page orientation. Also, with scalable fonts, you must use a line-spacing adjustment command to set the innate line spacing for the new font.

Each emulation has a default font mode for bitmap fonts which takes effect when the emulation is enabled. Font mode 15 is the default font mode of the Line Printer emulation. The other emulations have lower default font mode values.

If you use a variety of bitmap fonts, you will probably find font mode 13 most convenient. In font mode 13 character spacing and orientation are always correct, and the line spacing remains constant when you change fonts. Font mode 13 is the default font mode of the LaserJet emulation. To select font mode 13 in the other emulations, place the following sequence at the top of your program or file:

```
!R! RES; FTMD 13; EXIT;
```

(Place FTMD after RES, because RES resets the font mode.)

One reason for selecting font mode 13 over font mode 15 is that a self adjusting line spacing feature can create disastrous affects with software applications designed to handle line spacing without the assistance of Prescribe.

For lower font mode, such as the default font modes in emulation modes 1 through 5, spacing and orientation adjustments may be necessary when you change fonts. Use the following commands:

SCS (Set Character Spacing) or **SCPI** (Set Characters Per Inch), to adjust the character spacing, **SLS** (Set Line Spacing) or **SLPI** (Set Lines Per Inch), to adjust the line spacing, **SPO** (Set Page Orientation), to adjust the page orientation.

The following sequences both use the `FONT 19;` command to select the 10-point Dutch 801 font with landscape orientation and proportional character spacing. Neither sequence affects the line spacing.

```
!R! FONT 19; SPO L; SCS 0; EXIT;
```

or

```
!R! FTMD 13; FONT 19; EXIT;
```

For making many font changes within a document, use the **ALTF** (change to ALTernate Font) and **SETF** (SET alternate Font) commands instead of FONT. To switch repeatedly between fonts 6 and 8, for example, place the following sequence at the beginning of your document:

```
!R! SETF 1,6; CMNT PrestigeEliteBM10-Roman;
SETF 2, 8; CMNT LetterGothicBM12-Roman;
EXIT;
```

Then use `!R! ALTF1; EXIT;` within the document to select font 6 and `!R! ALTF2; EXIT;` to select font 8. The advantages of ALTF and SETF are that:

- The numbers are easy to remember (1 and 2 instead of 6 and 8).
- All the font number assignments are collected in one place, where they can be easily checked.

- If you change your mind and decide to use LetterGothicBM12-Bold (font 9) instead of LetterGothicBM12-Roman, all you have to change is one SETF command (from `SETF 2, 8;` to `SETF 2, 9;`).

In emulation modes 1, 2, and 5, the SETF command can team up in a very effective way with embedded word-processing commands. See *Chapter 6* for details.

The **SCF** (Save Current Font) and **RPF** (Return to Previous Font) commands enable font numbers to be managed in stack fashion. These commands are particularly useful at the beginning and end of macros, and when you are using embedded commands of word-processing software. To ensure that the saved font is retrieved with the correct code set, add the **SCCS** (Save Current Code Set) and **RPCS** (Return to Previous Code Set) commands to the SCF and RPF command, respectively.

For instance, to select a font using embedded commands, you can save the current font, call a new font, enter the text and return to the previous font, as in the following sequence.

```
!R! SCF; FONT 7; EXIT; (Text of footnote...)
!R! RPF; EXIT;
```

This sequence leaves the current font, prints the footnote in font 7 (PrestigeEliteBM7.2-Roman), then returns to the previous font.

Selecting Fonts Using the SFNT Command

Use the SFNT command to specify a font by typeface or give a font number to a scalable font, making it possible to select a scalable font with the FONT command.

For example, to print text using the scalable Dutch font (Dutch801SWC-Roman) at 10 points, use the following sequence:

```
!R! SFNT 'Dutch801SWC-Roman', 10; EXIT;
```

Here, **Dutch801SWC-Roman** represents the typeface name and 10 represents font height in the unit of points. Note that the SFNT command recognizes all character heights in terms of points, regardless of the specified unit value.

The SFNT command works with both bitmap fonts and scalable fonts. However, parameters other than 'typeface' are ignored when using the command to select a bitmap font.

The SFNT command is particularly useful when you want to assign the font number to a scalable font and alter its appearance by compressing, expanding, or obliquing it. The following example selects a scalable Dutch font, sizes it to 10 points, assigns it the font number 1001 and the Roman-8 symbol set, compresses it to 90 percent of its normal width, and obliques the font so that it tilts forward at an angle of 13.5 degrees.

```
!R! SFNT 'Dutch801SWC-Roman', 10, 1001, 277, .9, .3; EXIT;
```

In this sequence, the assignment of font number 1001 enables it to be selected using the FONT command. Once this assignment has been made, it remains effective until changed with another SFNT command or until the power is turned off.

Following the font number assignment, value 277 selects the symbol set *Roman-8*. A full list of symbol sets and values appear on the SFNT command page in *Chapter 2*.

The value .9 following the symbol set parameter indicates compression to 90 percent of normal width. Compression can be specified in a range from 0.3 (30 percent) to 3 (300%).

Compression = 0.3 Compression = 1 Compression = 3

Finally, the value .3 concluding the font selection sequence specifies a forward tilt of 13.5 degrees. The angle for normal characters is 0. Negative values result in backward-tilting characters. The angle parameter accepts any value from –1 (–45°) to 1 (45°). Examples appear below.

Angle = –1 Angle = 0 Angle = 1

The parameters for symbol set, compression, and obliquing must be either all specified or all omitted.

Selecting Fonts Using the FSET Command

The FSET command provides a third method of selecting fonts: either bitmap fonts or scalable fonts. This selection is made based on font characteristics and font location in the printer.

Font characteristics upon which selection is based appear in order of priority, from highest to lowest as follows:

Symbol set
Spacing
Pitch
Point size (height)
Style
Stroke weight
Typeface family
Location
Orientation

In selecting a font, the printer searches the available fonts to match a characteristic based on the highest priority. If this matching produces only one font, that font is selected. If many fonts match this highest priority, then matching begins with the next highest characteristic. The printer continues going down the list until only one font is left, then that font is selected.

A font may reside in any of three locations: printer ROM (for resident fonts, and option fonts, if installed), memory card (for card option fonts), and printer RAM (for downloaded fonts). A font in printer ROM has lower priority than an identical font on a memory card, and a memory card font has a lower priority than an identical font in printer RAM. Also, assuming all other characteristics are the same, a scalable font has lower priority than a bitmap font.

The last characteristic checked is the font orientation. If two fonts are found that differ only in orientation, the one selected is that which matches the page orientation. If only one font remains and its orientation does not match the orientation of the page, the printer rotates the font to match the page orientation.

The example below shows an FSET command sequence that selects the fixed-pitch, 12-cpi, 12-point, upright, normal-weight, Letter Gothic font (LetterGothicBM12-Roman).

```
FSET 0p12h12v0s0b6T;
```

This command sequence may be followed by a **CSET** (Change current symbol SET) command which selects the desired HP symbol set. In the example below, the Windows symbol set is selected.

```
CSET 9U;
```

HP symbol set values can be referenced on the CSET command page in *Chapter 2*.

Placement of Font Commands

It is important to note that most existing word-processing software will not recognize Prescribe 2e font selection commands. However, this software typically accommodates embedded printer commands whereby the Prescribe command placed in a document is recognized as a printer command and not as document text. The following command sequence demonstrates the embedded commands which might appear in a document.

Example of an appropriate command placement:

... end of previous paragraph.
`!R! ALTF 2; EXIT;`
Title or Heading `!R! ALTF 1; EXIT;`
Start of next paragraph ...

The first ALTF command appears on a blank line. The second ALTF command is placed at the end of a short title or heading, so that it fits on the same line and does not affect the line count.

Font Selection by Embedded Commands

Word-processing programs with IBM and Epson printer drivers include support for a set of specific typefaces. Kyocera internally assigns these typefaces to match similar typefaces already in the printer. Kyocera users may reassign these fonts to create a custom font list. To make this change, refer to the SETF command in *Chapter 2*.

Word-processing programs that support the Diablo 630 printer use embedded *ribbon-color* commands. The page printer translates these internally into ALTF commands. By placing two SETF commands at the top of a file, you can designate any two desired fonts by ribbon-color commands.

Word-processing programs that support the LaserJet printer have font description commands. Kyocera page printers understand these commands. You can use them to select any of the page printer's fonts.

When you select fonts by selecting your software's own commands, your software recognizes the command and is not thrown off in its tracking of characters per line or lines per page. The IBM, Epson, and LaserJet emulations support enough embedded commands to meet nearly all font selection needs. Only in the Line Printer emulation must you rely wholly on Prescribe 2e commands for font selection.

Details on font selection by embedded command appear in *Chapter 6*.

3.4. Creation of New Symbols and Characters

With a little work, it is possible to design completely new bit-map characters by constructing their dot maps. This technique can be used to obtain special characters and symbols not provided in any of the page printer's symbol sets. The relevant command is the **LDFC** (LoaD Font Character) command.

One LDFC command defines one character, specifying its font number, character code, dimensions, orientation, and bit map. An entire new font can be created by specifying an LDFC command for each character. The command format appears as follows.

LDFC *font*, *code*, *height*, *width*, *y-offset*, *x-offset*, *cell width*, *center*, *rotation*, *resolution*; *bit map*;

Some of the dimension parameters are specified in dots ($^1/_{300}$ inch). Other dimensions are specified in micro dots, a unit of measurement equal to $^1/_{32}$ of 1 dot. These units are used regardless of the unit set by the UNIT command. The rotation parameter is a non executable parameter. It does not change the orientation of the character. Instead, it tells the printer what the character's orientation is, so that the printer can adjust the page orientation correctly (when the font mode is *8* or higher), and can select the font in response to embedded word-processing commands for a particular rotation. The rotation parameter should be the same for all characters in the font.

The bit map can be constructed by drawing the character on square-ruled paper (shown at right) and proceeding as explained below. To demonstrate, we shall encode the bit map for a small diamond-shaped character (the figure on the next page).

Character dot pattern

The pattern is 13 dots high and 13 dots wide. The pattern is encoded as a series of 16-bit words. If necessary, blank cells may be added on the right to make the width a multiple of 16. For this reason, the three extra columns appear on the right (see the figure above).

Each 16-bit word is encoded with three characters, representing the most significant six bits, the next six bits, and the least significant four bits, respectively, as shown in *Defining Your Own Fill Patterns* in *Chapter 1*.

To obtain the character codes, divide the word into sections of *six*, *six*, and *four* bits and calculate the numerical value of each section (referred to as *x*, *y*, and *z*, respectively), treating it as a binary number in which the white dots are zeros and the black dots are ones. Then add an *offset* of 64 to the values of the six-bit sections and 48 to the values of the four-bit sections. The result is the ASCII code of the character representing that section (*x*, *y*, and *z*, respectively). Refer to the example of dot map and numerical derivation in *Defining Your Own Fill Patterns* in *Chapter 1*. The procedure for the numerical derivation is identical to creating fill patterns for XPAT.

Six-bit sections consisting of all black dots, as in the middle row of this symbol, are a special case. They encode by using the ASCII code 127, which is the unprintable delete code. Character 47 (/) may therefore be used instead.

The resolution may be specified for 300 or 600 (dpi) only in printer models that support the 600-dpi resolution printing. LDFC generated 300 dpi characters may print when the default resolution is 300 or 600 dpi. It is not possible for 600 dpi LDFC generated characters to print at 300 dpi.

The bit map data proceeds from left to right across the character pattern, then from top to bottom. The data can be formatted by inserting line-feeds, but not spaces. If we assign this character an x-offset of 0 and a y-offset and cell width of 500 micro dots each, and make it ASCII code 42 (*) of font 1000, it creates the following LDFC command:

```
!R! LDFC 1000, 42, 13, 13, 500, 0, 500, 250, 0;
    @'0@'0Ap0Ap0Cx00~0//J80~0Cx0Ap0Ap0@'0@'0;
    UNIT C;
    BOX 4.35, 0.75, L;
    FONT 1000;
    TEXT ' * * * * * * * * ';
EXIT;
```

3.5. Symbol Set

The page printer can produce sets of alphabet, numeric, and symbol characters. These sets, with each character assigned to a particular code, are known as symbol sets.

The following figure shows all the characters included in the most common symbol set, HP Roman-8.

Roman-8 Symbol Set

```
 !"#$%&'()*+,-./0123456789:;<=>?
@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^
‘abcdefghijklmnopqrstuvwxyz{|}~▒
ÀÂÈÊËÎÏ´ˆ`ˆ¨˜ÙÛ£¯Ýý°ÇçÑñ¡¿¤£¥§ƒ¢
âêôûáéóúàèòùäëöüÅîØÆåíøæÄìÖÜÉïßÔ
ÁÃãÐðÍÌÓÒÕõŠšÚŸÿÞþ•µ¶¾—¼½ª º«■»±
```

In addition to a large selection of bitmap and scalable fonts, the page printer supports many symbol sets (also referred to as *character sets*). The variety of Kyocera supported symbol sets can be attributed to the numerous printer emulations. Most of those symbol sets are the same regarding the letters of the alphabet, digits, and basic punctuation marks, but they differ considerably in their special symbols which lie in the upper half of the character code table, consisting of character codes 128 through 254 (hex 80 through FE).

Charts for the available symbol sets in each emulation appear in *Chapter 6*.

Only the resident fonts can be assigned with a new symbol set. All downloaded fonts contain specific symbol sets.

International Characters

The **INTL** (print INTernationaL characters) command provides quick access to printing characters from a different character set, characters not found in the default symbol set (**US ASCII**). By simply using the INTL command with appropriate parameters for language and country code, the Kyocera user can access a wide variety of specific characters.

The following sequence selects the ISO-4 U.K. symbol set for the Swiss721BM8-Roman font in the HP LaserJet emulation:

```
!R! UNIT P; CMNT Emulation must be HPLJ;
    FONT 13;
    INTL 3, 1; CMNT ISO-4 U.K.;
EXIT;
```

The U.K. symbol set is identical to the US ASCII character set except that it has the pound currency symbol (£) in place of the number sign (#).

It should be noted that the symbol set selected by INTL is specific to the currently emulated printer (HP LaserJet in the above example). If the current emulation is changed to Diablo 630 for the example above (by a SEM command, for example), the INTL command selects the Diablo U.K. symbol set instead of HP ISO-4 U.K. symbol set.

Selecting HP Symbol Sets

The HP LaserJet emulation has considerably more supported symbol sets than can be accessed through the INTL command. To establish a symbol set, use one of the following commands.

CSET (Change symbol SET)
SFNT (Select current FoNT by typeface)

The CSET command selects a symbol set by specifying its identification code which closely resembles the command parameters of the HP printer control language. In the example below, the Windows symbol set is selected.

```
CSET 9U;
```

The CSET command may be preceded by an FSET font selection command. Remember that the symbol set has the highest priority in font selection. The following example still selects the ISO-4 U.K. symbol set for the Swiss742SWC-Roman font in the HP LaserJet emulation:

```
!R! UNIT P;
    FSET 1p12v0s0b4148T; CMNT 4148 means Swiss742;
    CSET 1E; CMNT ISO-4 U.K.;
EXIT;
```

The SFNT command, primarily used to select and size a scalable font as stated previously, also provides the parameter that specifies a symbol set for the font. It has the following format:

SFNT '*typeface*'[, *height*[, *font-number*[, *symbol-set*, *compression*, *angle*]]];

In the above format, the *symbol-set* parameter specifies the symbol set for the font designated by *typeface*. The symbol-set value must be given together with the *compression* and *angle* parameters. In the example below, the symbol-set value 37 assigns the ISO-4 U.K. symbol set to the Swiss742SWC-Roman font.

```
!R! UNIT P;
    SFNT ‘Swiss742SWC-Roman’, 12, 2000, 37, 1, 0;
    CMNT 37=ISO-4 U.K.;
EXIT;
```

The symbol set values are tabled in *LaserJet Symbol Sets* in *Chapter 6*.

Chapter 4

Barcodes

The page printer is capable of printing a wide variety of barcodes, with human-readable text if desired. The user need only specify the type of barcode and the data to be encoded. The printer performs the rest of the work, including bar and space generation, symbol translation, insertion of start and stop codes, checksum calculation, interleaving, padding, zero suppression, and parity reversal.

Note: **The scanability of barcodes is affected by the quality of the paper and the type of scanner used. Parameters of the BARC command enable the width of the bars and spaces to be adjusted to compensate for these factors. A certain amount of testing and experimentation may be needed to find the right parameter values for a particular set of conditions.**

Prescribe uses the BARC (draw BARCode) command to execute barcodes. This printer feature is described fully in this chapter.

The BARC command uses the following format.

BARC *type*, *flag*, '*string*'[, *short*, *tall*[, *bar1*, *bar2*, *bar3*, *bar4*, *space1*, *space2*, *space3*, *space4*]];

The BARC command prints specified data in barcode form. The cursor is located at the top left corner of the barcode for types 0 to 38, 40 and 41, and at the bottom left corner of the barcode for type 39, and does not move.

The *type*, *flag*, and *string* parameters are always required. The other parameters are optional. The type parameter is a number from 0 to 42 designating one of the barcode types listed in Table 4.1. Numbers outside the range from 0 to 42 are regarded as type 15 (MSI barcode with no check digit).

The *flag* parameter specifies whether (Y or y) or not (N or n) to print a human-readable text under the barcode. The text is printed in the printer's current font. Any desired font can be obtained by placing a font selection command before the BARC command. The flag parameter for barcodes 39 and 40 (USPS) must be N.

The *string* parameter gives the barcode data enclosed in apostrophes or quotation marks. The allowable length of the string and the characters that can be included depend on the barcode type. Table 4.2. lists the allowed lengths and character sets.

Table 4.2. also lists a default character that is used to fill out strings shorter than the minimum length and which may be substituted for any illegal characters in the string.

If the string is too long, it is truncated to the maximum allowed length.

Examples:

```
!R! UNIT I; BARC 11, N, '123456'; EXIT;
```

```
!R! BARC 0, Y, '12345678910'; EXIT;
```

The *short* and *tall* parameters specify the short and tall bar heights in the unit designated by the UNIT command (default: inches). The *short* and *tall* parameters must be both specified or both omitted. If they are omitted, the default values as shown in Table 4.3. must be specified.

Only barcode types 0 to 12, 35 to 38, and 39 have two bar heights. For types 13 to 34, 40, and 41, the bar height is determined by the short parameter and the tall parameter is ignored. Even when all bars are the same height, however, the command syntax requires that when a short parameter is specified, the tall parameter must be specified too.

Examples:

```
!R! UNIT I; BARC 15, N, '1234567890', .2, .2;
EXIT;
```

```
!R! UNIT I; BARC 8, Y, '123456', .6, .7; EXIT;
```

When two bar heights with human-readable text are used, in some cases the tall bars may overlap the text.

The *bar1* to *bar4* and *space1* to *space4* parameters adjust the width of the bars and spaces. Fine adjustment of these parameters may be needed to obtain scannable barcodes for a particular scanner and type of paper. The dots unit (`UNIT D;`) is convenient. Barcode 40 (USPS FIM) ignores all these parameters and therefore has a constant height and space.

Some barcode types have only two classes of widths (*bar1, bar2, space1, space2*). Others have three or four classes. Regardless of the barcode type, when any width parameter is specified all eight width parameters must be specified together. In the case of two classes of widths, dummy values must be specified for *bar3, bar4, space3,* and *space4*.

The bar and space width parameters should be specified in ascending order. The maximum specifiable value is 200 dots.

1 ≦ bar1 ≦ bar2 ≦ bar3 ≦ bar4 ≦200 (dots)
1 ≦ space1 ≦ space2 ≦ space3 ≦ space4 ≦ 200 (dots)

If the bar and space width parameters are omitted, the printer uses suitable default values. Table 4.3 indicates the number of width classes and the default values for each barcode type.

Barcode 19 (Code 39) has two width classes, which are set to 5 and 10 dots respectively in the example below. *Bar1* and *space1* are both 5 dots, and *bar2* and *space2* are 10 dots. *Bar3, space3, bar4,* and *space4* are all given dummy values of 10.

Examples:

```
!R! UNIT D;
BARC 19, Y, '0123ABC', 60, 60, 5, 10, 10, 10, 5, 10, 10, 10;
EXIT;
```

0123ABC

The above widths are doubled in the next example.

```
!R! UNIT D;
BARC 19, Y, '0123ABC', 60, 60, 10, 20, 20, 20, 10, 20, 20, 20;
EXIT;
```

0123ABC

Barcode 36 (EAN 8 with a five-digit supplement) has four width classes, which are set to 10, 20, 30, and 40 dots in the example below. Two bar heights are also used.

```
!R! UNIT D;
BARC 36, N, '012345678912', 180, 220, 10, 20, 30, 40, 10, 20, 30, 40;
EXIT;
```

Barcode 39 (USPS POSTNET) prints a POSTNET barcode on a mail piece. The United States Postal Service (USPS) utilizes POSTNET (POSTal Numeric Encoding Technique) to process bulk mail and business reply envelopes quickly and efficiently.

Though this barcode accepts any values within the range specified on the previous page, we recommend that all parameters except *type*, *flag*, and *string* **not** be specified as the scanability of the barcode is most effective with the default values. Also the *flag* parameter for this barcode must be N (do not print human-readable text). See the figure on 4-11. for POSTNET barcode location.

Barcode 41 (USPS FIM) prints a Facing Identification Mark pattern which may be printed on the envelope adjacent to the stamp. The combination of a FIM and the POSTNET (barcode 39) barcode enables faster processing by the USPS.

When generating a FIM pattern, all parameters except *type, flag,* and *string* are ignored. The flag parameter must be N. Characters permitted for the string parameter are 'A', 'B', 'C', and 'D' only, and each represents one of four different FIM patterns. For example, Courtesy Replay Mail and stamped reply mail require the FIM-A pattern, while Business Reply Mail and unstamped (prepaid) return mail require the FIM-C pattern. Also see the figure on 4-11 for FIM location.

Barcode 43 (Customer) has four bar heights. Only the shortest and tallest bar heights are specifiable, the heights for the intermediate two bars being adjusted automatically. Any values entered for bar and space widths are ignored and defaulted to 1.68 points respectively. The rules for the order of specifiable bar and space widths, bar1≦bar2≦bar3≦bar4 and space1≦space2≦space3≦space4, must be adhered to, however.

Table 4.1. Barcode Types

No.	Type
0	UPC A
1	UPC A with two-digit supplement
2	UPC A with five-digit supplement
3	UPC D-1
4	UPC D-2
5	UPC D-3
6	UPC D-4
7	UPC D-5
8	UPC E
9	UPC E with two-digit supplement
10	UPC E with five-digit supplement
11	EAN-8
12	EAN-13
13	DUN-14 (Distribution Unit Number, EAN)
14	DUN-16 (Distribution Unit Number, EAN)
15	MSI with no check digit
16	MSI with single mod-10 check digit
17	MSI mod-10 followed by mod-10 check digit
18	MSI mod-11 followed by mod-10 check digit
19	Code 39 with no check digit (USD-3)

No.	Type
20	Code 39 with mod-43 check digit (USD-3)
21	Interleaved two of five (USD-1) with no check digit (See No. 41.)
22	Identicon two of five with no checksum
23	Code 128 (USD-6) manual code change
24	Code 128 (USD-6) automatic code change
25	Code 11 with only 'c' checksum (USD-8)
26	Code 11 with both 'c' and 'k' checksums (USD-8)
27	Code 93 with both 'c' and 'k' checksums (USD-7)
28	CODABAR with no check digits (USD-4)
29	Matrix two of five with no checksum
30	Datalogic two of five with no checksum
31	Industrial two of five with no checksum
32	Ames with no checksum
33	Delta distance 'a' (IBM) with no checksum
34	Delta distance 'a' (IBM) with checksum
35	EAN 8 with two-digit supplement
36	EAN 8 with five-digit supplement
37	EAN 13 with two-digit supplement
38	EAN 13 with five-digit supplement
39	POSTNET (USPS)
40	FIM (USPS)
41	Interleaved two of five (USD-1) with checksum
42	UCC/EAN 128
43	Customer [FS-600/FS-800/FS-7000/FS-7000+/FS-9000]
44	Wide gap CODABAR [FS-600/FS-800/FS-7000/FS-7000+/FS-9000]

Table 4.2. Length, Character Set, and Default

Type	Length	Character set	Default
0	11	0123456789	0
1	13		
2	16		
3	13		
4	18		
5	22		
6	25		
7	29		
8	6		
9	8		
10	11		
11	7		
12	12		
13	13		
14	15		
15	1-14		
16	1-14		
17	1-14		
18	1-14		
19	1–40	$%+-./0123456789ABCDEFGHIJK LMNOPQRSTUVWXYZ and space	Space
20	1–40		
21	2–26	0123456789	0
22	1–25		
23	1–40	All printable characters (ASCII codes 32 to 126)	Space
24	2–40		
25	1–45	-0123456789	Space
26	1–45		
27	1–50	All printable characters (ASCII codes 32 to 126)	Space
28	3–32	$+-./0123456789:abcdetn*	–
29	1–25	0123456789	0
30	1–25		
31	1–25		
32	1–25	-0123456789	0
33	1–25	0123456789KLMO	0
34	1–25		
35	9	0123456789	0
36	12		
37	14		
38	17		

Type	Length	Character set	Default
39	139	0123456789	–
40	1	One of the following FIM pattern types: A – Country Reply Mail with POSTNET. B – Business Reply, Penalty and Franked Mail without POSTNET. C – Business Reply, Penalty and Franked Mail with POSTNET. D – OCR Readable Mail without POSTNET.	
41	125	0123456789	0
42	80	All printable characters (ASCII codes 32 to 126)	0
43	1-20	0123456789ABCDEFGHIJKLM NOPQRSTUVWXYZ	–
44	3-32	$+-./0123456789:abcdetn* and space	–

Table 4.3. Bar Height and Width Classes

Type	Tall bars	Width classes				Default (dots)			
		1	2	3	4	1	2	3	4
0	Yes	Yes	Yes	Yes	Yes	6	12	18	24
1	Yes	Yes	Yes	Yes	Yes	6	12	18	24
2	Yes	Yes	Yes	Yes	Yes	6	12	18	24
3	Yes	Yes	Yes	Yes	Yes	6	12	18	24
4	Yes	Yes	Yes	Yes	Yes	6	12	18	24
5	Yes	Yes	Yes	Yes	Yes	6	12	18	24
6	Yes	Yes	Yes	Yes	Yes	6	12	18	24
7	Yes	Yes	Yes	Yes	Yes	6	12	18	24
8	Yes	Yes	Yes	Yes	Yes	6	12	18	24
9	Yes	Yes	Yes	Yes	Yes	6	12	18	24
10	Yes	Yes	Yes	Yes	Yes	6	12	18	24
11	Yes	Yes	Yes	Yes	Yes	6	12	18	24
12	Yes	Yes	Yes	Yes	Yes	6	12	18	24
13	—	Yes	Yes	—	—	6	12	(18)	(24)
14	—	Yes	Yes	—	—	6	12	(18)	(24)
15	—	Yes	Yes	—	—	6	12	(18)	(24)
16	—	Yes	Yes	—	—	6	12	(18)	(24)
17	—	Yes	Yes	—	—	6	12	(18)	(24)
18	—	Yes	Yes	—	—	6	12	(18)	(24)
19	—	Yes	Yes	—	—	6	12	(18)	(24)
20	—	Yes	Yes	—	—	6	12	(18)	(24)
21	—	Yes	Yes	—	—	6	12	(18)	(24)
22	—	Yes	Yes	—	—	6	12	(18)	(24)
23	—	Yes	Yes	Yes	Yes	6	12	18	24
24	—	Yes	Yes	Yes	Yes	6	12	18	24
25	—	Yes	Yes	Yes	—	6	14	21	(21)
26	—	Yes	Yes	Yes	—	6	14	21	(21)
27	—	Yes	Yes	Yes	Yes	6	12	18	24
28	—	Yes	Yes	—	—	6	18	(18)	(18)
29	—	Yes	Yes	—	—	6	12	(18)	(24)
30	—	Yes	Yes	—	—	6	12	(18)	(24)
31	—	Yes	Yes	—	—	6	12	(18)	(24)
32	—	Yes	Yes	—	—	6	12	(18)	(24)
33	—	Yes	Yes	Yes	—	6	12	18	(24)
34	—	Yes	Yes	Yes	—	6	12	18	(24)
35	Yes	Yes	Yes	Yes	Yes	6	12	18	24
36	Yes	Yes	Yes	Yes	Yes	6	12	18	24
37	Yes	Yes	Yes	Yes	Yes	6	12	18	24
38	Yes	Yes	Yes	Yes	Yes	6	12	18	24
41	—	Yes	Yes	—	—	6	12	(18)	(24)
42	—	Yes	Yes	Yes	Yes	6	12	18	24
44	—	Yes	Yes	—	—	6	18	(18)	(18)

Type	Height	Width	Pitch	Spacing
39	Tall: 0.125″ Short: 0.05″	0.02″	21 bars/inch	0.0475″
40	5/8″	0.031″	1/16″	(Tilt: ±5°)
43	Tall: 10.2 pt. Short: 3.4 pt.	1.68 pt.	–	1.68 pt.

Location of POSTNET and FIM

Chapter 5

Permanent Parameters

The page printer maintains a number of parameters in a battery-backed-up memory or in a non-volatile memory. These parameters control the initial state of the environment at power-up, including the initial emulation mode, page orientation, character set, buffer allocations in memory, interface parameters, and other options.

The parameters may be changed permanently with the **FRPO** (Firmware RePrOgram) command. Some FRPO parameters affect only the current interface (interface-dependent) and some affect all interfaces at once (non-interface-dependent). If the printer is shared with other users, remember that any changes to any non-interface-dependent parameters may interfere with the print jobs of the other users. This chapter explains the FRPO command and gives examples of its use.

The current settings of the FRPO parameters are listed as option values on the printer's status page. Refer to the table in this chapter to interpret the values.

Before changing any FRPO parameters, print out a status page, so you will know the parameter values before the changes are made. To print a status page, send a **STAT** (print STATus) command to the printer or use the key on the printer's control panel. To return FRPO parameters to their factory default values, send the **FRPO INIT** (FRPO-INITialize) command.

5.1. Permanent Parameters

The FRPO parameters described in this chapter are stored in a battery-backed-up memory chip (SRAM) or a non-volatile memory and are retained indefinitely while power is off. Standard values are set in this chip at the factory. These factory settings can be changed to suit your own system requirements.

Typical Parameters

The following brief descriptions present several of the major FRPO parameters.

C5/C2/C3 and V0-V3 Default (power-up) font

These parameters define the default font at power up. The power-up font can be a bitmap font or a scalable font.

- The C5/C2/C3 parameters define a bitmap font as the power-up font. The factory setting for these parameters is font *1* (**CourierBM12-Roman**).
- The V3 parameter accepts a scalable font name of up to 32 characters and defines it to be the power-up font. The factory setting is *none* (null). In models that only have scalable fonts as resident fonts, Courier is the default font. The V0, V1, and V2 parameters specify the height of the font. The default size is 012.00 points.
- In models that only have scalable fonts as resident fonts, bitmap fonts can not be selected.

Note: **The V0-V3 parameters are valid in the LaserJet emulation only.**

- The selection of a bitmap or scalable font for the power-up font is interdependent. Specifying a new scalable font name in the V3 parameter automatically sets the C5/C2/C3 parameter value to 0; and conversely, specifying a new font number for the C5/C2/C3 parameter resets the V3 parameter value to null.

The V0-V3 parameters are ignored if the specified font is not present at power-up, and the printer selects the default font as specified by the C5/C2/C3 parameters.

The example below gives the Prescribe 2e sequence which changes the default font to Dutch801SWC-Roman, 14.25 points:

```
!R! FRPO V3, 'Dutch801SWC-Roman';
    FRPO V0, 0;
    FRPO V1, 14;
    FRPO V2, 25;
EXIT;
```

You can assign the default (power-up) symbol set to the power-up font by using the FRPO U6 and U7 parameters. However, if you assign a symbol set intended for scalable fonts as the default symbol set, it will be ignored at power up when the default font is a bitmap font. For details, refer to *LaserJet Symbol Sets* on page 6-47.

C8—PCL font range

The printer offers a greater variety of fonts than those of the HP LaserJet printer. Because of this, it is possible that a selected font may have no equivalent in the HP LaserJet printer.

The C8 parameter creates a font environment for the LaserJet emulation (mode 6) only. It enables the user to disable the PostScript fonts to prevent conflicts with the resident scalable fonts. The result is a font environment that more closely resembles the HP LaserJet. The following table identifies the groups of fonts available for specific C8 parameters.

C8 Parameter	Resident fonts				Option fonts
	Bitmap fonts (79)	Scalable fonts (45)	KPDL (PK-1/2/4) fonts (47)	FR-1 bitmap fonts (4)	FR-1 scalable fonts (46)
0	Used	Used	Not used	Used	Used
1	Not used	Used	Not used	Not used*	Used
2	Used	Used	Used	Used	Used
3	Not used	Used	Used	Not used*	Used

* *Used* for models FS-400/FS-1550/FS-3400 (each incl. type A)

As the table implies, parameter 1 will provide the closest matching PCL5 environment for font selection (evaluation).

U6/U7—Symbol set for international characters

The U6 parameter sets the default symbol set according to the code set value given by the U7 parameter. The factory setting is 0 (**US ASCII**). European users in particular may find a different selection more convenient. The page printer supports most of those provided by the emulated printers.

The symbol set which the U6 value selects for a specific country can vary considerably depending on the U7 value. Note that the blank entries mean that symbol set is unsupported for the code set.

U6 (Symbol set) value	U7 (code-set) value			
	1 (IBM code set)*	2 (Diablo code set)	5 (Epson code set)	6 (HP LaserJet** code set)
0 (US ASCII)	IBM US	Diablo US	LQ US	ISO-6 ASCII
1 (France)		Diablo France	LQ France	ISO-25 France
2 (Germany)		Diablo Germany	LQ Germany	HP German
3 (UK)		Diablo U.K.	LQ U.K.	ISO-4 U.K.
4 (Denmark/ Norway)	IBM D/N	Diablo Denmark	LQ Denmark	ISO-60 Norway
5 (Sweden)		Diablo Swe-den	LQ Sweden	ISO-11 Swed-ish
6 (Italy)		Diablo Italy	LQ Italy	ISO-15 Italian
7 (Spain)		Diablo Spain	LQ Spain	HP Spanish
8 (Japan)		Diablo Japan	LQ Japan	ISO-14 JIS ASCII
9 (US Legal)	US Legal	Diablo US Legal	LQ US Legal	US Legal
10 (IBM PC-850)	IBM PC-850		IBM PC-850	IBM PC-850
11 (IBM PC-860)	IBM PC-860		IBM PC-860	IBM PC-860
12 (IBM PC-863)	IBM PC-863		IBM PC-863	IBM PC-863
13 (IBM PC-865)	IBM PC-865		IBM PC-865	IBM PC-865

U6 (Symbol set) value	U7 (code-set) value			
	1 (IBM code set)*	2 (Diablo code set)	5 (Epson code set)	6 (HP LaserJet** code set)
14 (Norway)			LQ Norway	
15 (Denmark 2)			LQ Denmark 2	
16 (Spain 2)			LQ Spain 2	
17 (Latin America)			Latin America	

* In the Diablo emulation, characters and symbols consisting of character codes 0 through 20 (hex) and 80 through 9F (hex) are not printed.

** The HP LaserJet symbol sets can be established as the power-up default symbol set when unique values are assigned for the U6 and U7 parameters. The matching symbol sets for these parameters can be found in *Chapter 6*.

I0—Name of the partition in memory card

The FRPO I0 specifies a memory card partition name to be read at power up. Only one partition may be specified with FRPO I0 command. The host data (macros and forms) read from the named partition at power up will be available to users accessing the currently-active interface. The FRPO M2 parameter enables the printer to read the partition name into a port apart from the currently active one. For instance, if the active port were the parallel port but the M2 parameter specified the serial port, then the memory card host data would be available to users accessing the serial interface.

The command uses the following format:

`FRPO I0, '`*partition-name*`';`

Note that a comma must be placed after the I0 parameter. The partition name should not exceed 15 printable ASCII characters (20H through 7EH) and be enclosed by single or double quotation marks. Partition names are case-sensitive so the correct upper and lowercase characters must be used in the FRPO I0 string.

I8—End-of-job interpretation (Option interface only)

The FRPO I8 parameter determines whether a form feed is issued at the end of a print job. The default value (0) specifies that a form feed will not be issued with the End of Job command. An `FRPO I8, 1` enables a form feed to accompany the End of Job command.

M1—Status send control

The FRPO M1 parameter enables the user to receive printer status information through the serial or optional interfaces. By sending CTRL-T (Hex 14) from the host computer to the FS-series printer, the user can receive status information about printer ready or waiting states, the total page count for the printer, the default page size, and the available memory size in bytes. The command uses the following format:

```
FRPO M1, n;
```

n = 0 (factory default) reports status in KPDL mode only
  = 1 reports status in all emulations
  = 20 treats all CTRL-T commands as data in all emulations

M2—Default interface for control panel

The FRPO M2 parameter establishes the power-up interface. The default value (2) specifies the parallel interface. The command uses the following format:

```
FRPO M2, n;
```

n = 2 parallel (factory default)
  = 3 option interface (if installed)

When used in combination with the FRPO I0 command, the FRPO M2 command will enable the user to automatically download data from the memory card data partition upon power up. This data will be accessible only to users on the default interface. A printer control panel function will allow the user to download the memory card data partition into other interfaces.

M3—Host buffer mode

The M3 parameter determines the way each host buffer selects the interface to receive data, *automatic* or *fixed*.

If the M3 value is *0* (automatic), the first data arriving from the computer go into buffer #1, regardless of which interface they arrive on, and the printer begins printing these data. While buffer #1 is still in use, if data also begin to arrive on a second interface they are stored in buffer #2. The printer will print these data after it has finished printing the job received through buffer #1. The general rule is that data go to the available buffer.

If the M3 value is *1* (fixed), buffer #1 is fixed to receive only the data arriving on the parallel interface; and buffer #2 is fixed on the option interface (if installed). The first data arriving on one of the interfaces go into its fixed, *dedicatd* buffer and the printer begins printing these data, and continues as above.

The factory setting of the total host buffer size is 60 kilobytes (FS-7000+/FS-9000 is 500 kilobytes) and can be changed by the FRPO H8 command.

Note: **If you alter the parameters for the buffer sizes, reset the printer by turning the power off and on again or by using the front panel keys.**

M5/M6/M7—Host buffer sizes

The printer utilizes three host buffers for each of its interfaces through which the printer receives data simultaneously. These parameters determine the ratio between the sizes of these buffers. Parameters M6 and M7 are provided for option interfaces. (Some printers have two option interfaces.) However, these parameters are valid only if the corresponding option interface is actually installed.

For example, to power up the printer with the buffer sizes for the parallel and option interfaces shared in the ratio of 5:1, give the following command and reset the printer.

```
!R! FRPO M3, 1;
FRPO M5, 5; FRPO M6, 1; EXIT;
```

The M3 value establishes that fixed allocation of buffer memory will be used. For values of 0 used in the M4-M7 parameters, the corresponding buffer size will be 1 kB.

N8—Default Resolution

The FRPO N8 command for default printer resolution is available on the FS-series printers that support 600 dpi or 1200 dpi resolution. The command enables the user to choose default printer resolution: a value of 3 establishes 1200 dpi, a value of 1 establishes 600 dpi and a value of 0 establishes a 300 dpi default resolution.

Note: **The FRPO N8 is a common parameter saved permanently and effecting all printer interfaces. In addition to this permanent command, the printer's front control panel can be used to establish the default resolution. PJL commands for switching resolutions, prominent in many software printer drivers, is supported by the FS-series printers. There are no Prescribe 2e commands specifically designed for changing default resolution. The SeT dot Resolution command (STR) effects Prescribe raster graphics only.**

P4/P5—Automatic Emulation Switching (AES) mode

The FRPO P4 command establishes Automatic Emulation Switching (AES) for FS-series printers installed with the optional KPDL. With AES enabled (a P4 value of 1), the printer will switch emulations from a KPDL emulation to a non-KPDL emulation, or from a non-KPDL emulation to KPDL, based upon the type of data the printer receives. The FRPO P5 value specifies the non-KPDL emulation to which the printer switches from KPDL. The factory default for P5 is the HP LaserJet.

Note: **The automatic emulation switching mode may not operate properly if a file contains Prescribe 2e command.**

For model FS-600, the automatic emulation switching is automatically enabled on the option interface when the KPDL kit is installed.

5.2. FRPO Parameters

The FRPO command changes the value of one parameter in permanent memory. A separate command is required for each parameter change. The parameters, their meanings, and the specifiable values are listed below.

In these tables, the **Interface-dependent parameters** affect the environment on the current interface only. Any changes made to the parameters on one interface will not change parameters on the other interfaces. To change a similar parameter on another interface, first switch to that interface then issue the FRPO command.

The **Interface-common parameters** affect all interfaces simultaneously. If the printer is shared with other users, remember that changes made to non-interface-dependent parameters can affect users on other interfaces as well.

Note: **Certain parameters are available only when the printer is installed with the relevant option equipment/kit.**

Interface-dependent Parameters

Environment	Parameter	Value	Factory setting
Top margin*	A1	Integer value in inches	0
	A2	Fraction value in 1/100 inches	0
Left margin*	A3	Integer value in inches	0
	A4	Fraction value in 1/100 inches	0
Page length*	A5	Integer value in inches	13 (16)**
	A6	Fraction value in 1/100 inches	61 (60)**
Page width*	A7	Integer value in inches	13 (16)**
	A8	Fraction value in 1/100 inches	61 (60)**
Page orientation*	C1	0: Portrait 1: Landscape	0
Default font No.*	C5	First two digits of power-up font	00
	C2	Middle two digits of power-up font	00
	C3	Last two digits of power-up font	01
PCL font range	C8	See page 5-3.	0
KC-GL options*	G0	0: Mode A; formfeed to SP0 1: Mode B; formfeed to SP0 2: Mode A; no formfeed to SP0 3: Mode B; no formfeed to SP0 4: Fixed mode A; formfeed 5: Fixed mode B; formfeed 6: Fixed mode A; no formfeed 7: Fixed mode B; no formfeed 8: Mode A; formfeed 9: Mode B; formfeed 10: Mode A; no formfeed 11: Mode B; no formfeed 12: Fixed mode A; formfeed 13: Fixed mode B; formfeed 14: Fixed mode A; no formfeed 15: Fixed mode B; no formfeed	0
KC-GL pen width*	G1 through G8	0 to 99 dots	01/02/03/04/ 05/06/07/08
Interface release time-out value	J2	Value in units of 5 seconds:0-99	6

* Ignored in some emulation modes.

** For models FS-6500/FS-7000/FS-7000+/FS-9000

Environment	Parameter	Value	Factory setting
KC-GL enlarge mode*	J9	0: Off 1: A2 2: A1 3: A0 4: B3 5: B2 6: B1 7: B0	0
Duplex mode	N4	0: Simplex mode 1: Long-edge binding 2: Short-edge binding	0
Default emulation mode	P1	0: Line Printer 1: IBM Proprinter X24E 2: Diablo 630 5: Epson LQ-850 6: HP LaserJet 8: KC-GL 9: KPDL	6
Carriage-return action	P2	0: Ignored 1: Carriage-return 2: Carriage-return+linefeed	1
Linefeed action	P3	0: Ignored 1: Linefeed 2: Linefeed+carriage-return	1
Automatic emulation sensing	P4	0: AES disabled 1: AES enabled	0
Alternative emulation mode	P5	Same as the P1 values except that 9 is ignored.	6 (HP LJ)
AES option 1—Page eject command as AES trigger	P7	0: All page eject commands 1: None 2: All page eject commands and Prescribe *EXIT* command 3: Prescribe *EXIT* command 4: ^L command 6: Prescribe *EXIT* command and ^L command	2
AES option 2—Emulation after receiving Prescribe *!R!* command	P8	0: Current emulation 1: Change to the default emulation (P1) 2: Change to the alternative emulation (P5)	2
Sorter sharing	S0	0: Single user 1: Multiple users 2: Multiple interfaces	0
Sorter mode	S1	0: Sorter 1: Collator 2: Stacker 3: Mailbox	0

* Ignored in some emulation modes.

Environment	Parameter	Value	Factory setting
Sorter message	S2	0: `Remove sorter paper` messaged 1: `Remove sorter paper` deactivated except at power-up 2: `Remove sorter paper` deactivated	0
Sorter tray capacity	S3	Number from 5 to 50	50
Job separate	S8	0: Offset 1: 1st page only	0
Barcode mode for serial port	S9	0: Off (normal mode) 1: On (barcode reader mode)	0
Line spacing*	U0	Lines per inch (integer value)	6
Line spacing*	U1	Lines per inch (fraction value)	0
Character spacing*	U2	Characters per inch (integer value)	10
Character spacing*	U3	Characters per inch (fraction value)	0
Country code	U6	0: US 1: France 2: Germany 3: UK 4: Denmark 5: Sweden 6: Italy 7: Spain 8: Japan 9: US Legal 10: IBM PC-850 (Multilingual) 11: IBM PC-860 (Portuguese) 12: IBM PC-863 (Canadian French) 13: IBM PC-865 (Norwegian) 14: Norway 15: Denmark 2 16: Spain 2 17: Latin America	0
Code set at power up in daisywheel emulation	U7	0: Same as emulation mode 1: IBM 2: Daisywheel 3: Reserved 4: Reserved 5: Epson LQ-850 6: HP Roman-8	0
Default fixed-space scalable font pitch	U8	Integer value in cpi: 0 – 99	10
	U9	Fraction value in 1/100 cpi: 0 – 99	0
Default scalable font size*	V0	Integer value in 100 points: 0–9	0
	V1	Integer value in points: 0–99	12
	V2	Fraction value in 1/100 points: 0, 25, 50, or 75	0
Default scalable font name*	V3	Name of typeface of up to 32 characters, enclosed with single or double quotation marks	—

* Ignored in some emulation modes.

Interface-independent Parameters

Environment	Parameter	Value	Factory setting
Default pattern resolution	B8	0: 300 dpi 1: 600 dpi 3: 1200 dpi	0
Copy count	C0	Number of copies to print:1-999	1
Option font (FR-1) utility for KPDL*	C9	0: FR-1 fonts are not available for use in KPDL 1: FR-1 fonts are available for use in KPDL	0
Serial line control	D0	0: XON is sent every 5 seconds during the printer is ready or waiting. Error is ignored. 1: XON is sent every 5 seconds during the printer is ready or waiting. Error is valid. 10: XON is not sent. Error is ignored. 11: XON is not sent. Error is valid.	0
Buzzer mode	D2	0: Off 1: On	0
Paper size error	D3	0: Off 1: On	0
Print density	D4	Number from 1 (Light) to 5 (Dark)	3
Host buffer rate (Hard disk)	H0	0 to 99 in units of 10MB (0 to 990MB)	0
Serial interface baud rate	H1	3: 300 bps (not valid for some models) 6: 600 bps (not valid for some models) 12: 1200 bps 24: 2400 bps 48: 4800 bps 96: 9600 bps 19: 19200 bps 38: 38400 bps 57: 57600 bps 11: 115200 bps	96
Serial interface data bits	H2	7 or 8	8
Serial interface stop bits	H3	1 or 2	1
Serial interface parity	H4	0: None 1: Odd 2: Even 3: Ignore	0
Serial interface protocol	H5	0: Combination of 1 and 3 below 1: DTR, positive true 2: DTR, negative true 3: XON/XOFF 4: ETX/ACK 5: XON/XOFF recognized only as protocol	0
Buffer nearly-full threshold	H6	Percentage of the received data buffer size	90
Buffer nearly-empty threshold	H7	Percentage of the received data buffer size	70

* Ignored in some emulation modes.

Environment	Parameter	Value	Factory setting
Total host buffer size	H8	0 to 99 in units of 10kB (0: 5kB) 0 to 99 in units of the size defined by FRPO S5 (FS-7000+/FS-9000)	6 (4 for FS-600) 5 (500kB)
Form feed time-out value	H9	Value in units of 5 seconds (0 to 99)	6
Memory card partition reading at power-up	I0	Partition name on a memory card to be read automatically at power-up. Maximum of 15 printable ASCII characters (20H through 7EH), enclosed in single or double quotation marks	–
End-of-job interpretation (Only when an option interface (OPT2) is installed)	I7	0: Disabled 1: Adds ^L 2: Adds ^D 3: Adds ^L and ^D 7: Adds ^D and ^L	0
End-of-job interpretation (Only when an option interface (OPT1) is installed)	I8	0: Disabled 1: Adds ^L 2: Adds ^D 3: Adds ^L and ^D 7: Adds ^D and ^L	0
Reduce/enlarge ratio (Models supporting A3 size only)	J0	0: 100% 4: 61% [FS-6500 only] 5: 70% 6: 81% 7: 86% 8: 94% 9: 98% 20: 115% [FS-6500 only] 21: 122% [FS-6500 only] 22: 141% [FS-6500 only] 23: 163% [FS-6500 only]	0
Status send control	M1	0: Off 1: Send printer status	0
Default interface	M2	1: Serial 2: Parallel 3: Option (Aux*) 4: Option*	2
Host buffer mode	M3	0: Automatic 1: Fixed	0
First buffer size	M4	Size of the first buffer	3
Second (First) buffer size	M5	Size of the second (first) buffer	3 (1)
Third (Second) buffer size	M6	Size of the third (second) buffer	1
KIR mode	N0	0=Off or 0=Off 1=Light 2=On 2=Medium 3=Dark	2
Sleep timer time-out time	N5	Value in units of 5 minutes: 0 to 24 [0 to 120 min.]	6 (3)

Environment	Parameter	Value	Factory setting
Ecoprint level	N6	0: Off 1: Light 2: Medium 3: Dark or 0: Off 2: On	0
Reserved	N7	—	0
Default resolution	N8	0: 300 dpi 1: 600 dpi 3: 1200 dpi	1
PCL resource protection	N9	0: Off 1: Protects permanent PCL resources and resets the environment 2: Protects permanent and temporary PCL resource	0
Parallel interface mode	O0	0: Normal 1: High-speed mode 5: Nibble (High) 70: Auto (Negotiation) mode (except FS-3400)	5 or 70
—	O1	Reserved	1
Parallel line control in high-speed mode	O2	0: Off 2: HP LaserJet compatible	0
Message language	P0	0: English 1: French 2: German 3: Danish 4: Swedish 5: Italian 6: Spanish	0
Command recognition character	P9	ASCII code from 33 to 99	82 (R)
Default stacker	R0	1: Face-down tray 2: Face-up tray 3: Sorter's Bulk tray (SO-6)/ Bulk stacker's tray	1

Environment	Parameter	Value	Factory setting
Auto cassette switching	R1	0: Cassette not switched when empty 1: Switched between the printer's cassette and the upper feeder cassette 2: Switched between the upper and lower feeder cassettes 3: Switched between the printer's cassette and the lower feeder cassette 4: Switched among all cassettes 99: Switched according to the page size command in data The following values are used in the FS-7000/FS-7000+/FS-9000. 0: Cassette not switched when empty 1: Cassettes 1 and 2 2: Cassettes 3 and 4 3: Cassettes 5 and 6 4: Cassettes 1 through 4 5: Cassettes 3 through 6 6: Cassettes 1, 2, 5 and 6 7: Cassettes 1 through 6 The following values switches Cassettes of the same paper size. 11: Cassettes 1 and 2 12: Cassettes 3 and 4 13: Cassettes 5 and 6 14: Cassettes 1 through 4 15: Cassettes 3 through 6 16: Cassettes 1, 2, 5 and 6 17: Cassettes 1 through 6 99: Switched according to the page size command in data The R1 parameter is ignored if the PSRC 100; (automatic cassette switching by paper type) is issued (in models that support the automatic cassette switching function).	0

Environment	Parameter	Value		Factory setting
Default paper size	R2	0: Size of the default cassette (See R4.) 1: Monarch (3-7/8 × 7-1/2 inches) 2: Business (4-1/8 × 9-1/2 inches) 3: International DL (11 × 22cm) 4: International C5 (16.2 × 22.9cm) 5: Executive (7-1/4 × 10-1/2 inches) 6: Letter (8-1/2 × 11 inches) 7: Legal (8-1/2 × 14 inches) 8: A4 (21 × 29.7 cm) 9: B5 (18.2 × 25.7 cm) 10: A3 (29.7 × 42 cm) 11: B4 (25.7 × 36.4 cm) 12: Ledger (11 × 17 inches) 13: A5 (14.8 × 21 cm) 14: A6 (10.5 × 4.8 cm) 15: B6 (12.85 × 18.2 cm) 16: Commercial 9 (3-7/8 × 8-7/8 inches) 17: Commercial 6-3/4 (3-5/8 × 6-1/2 inches) 18: International B5 (17.6 × 25 cm) 19: Custom* 30: C4* 31: Hagaki* 32: Ofuku-Hagaki*		0
Default cassette	R4	0: Manual feed/Multi-purpose tray 1: Printer's cassette/cassette 1 2: Cassette 2 3: Cassette 3 4: Envelope/universal feeder (cassette 4 for FS-7000/7000+/9000) 5: Cassette 5 6: Cassette 6 99: Envelope/universal feeder [FS-7000/7000+/9000 only]		1
Raster memory size (Reserved for FS-6500)	R5	1: 128 kB 2: 256 kB 3: 512 kB 4: A4/Letter 5: Legal 6: 2 × A4/Letter 7: 2 × Legal	1 – 3: Auto 4 – 5: On (for FS-600/1700/3700/7000/7000+/9000)	1
Parallel line control (FS-400/1550)	R6	0: Off 1: On		0
Manual paper size	R7	Same as the R2 values except 0. 0: Maximum paper size of the printer		8 (0 for U.S.)

Environment	Parameter	Value	Factory setting
Daisywheel data length	R8	7: 7-bit 8: 8-bit	7
Default envelope feeder paper size	R9	Same as the R2 values except: 0: A4 (Letter for U.S.A. and Canada)	0
A4/letter size Override	S4	0: Off 1: On	0
Host buffer size rate	S5	0: 10kB 1: 100kB 2: 1MB	1
RAM disk size	S6	1 to 99 (MB)	12
RAM disk mode	S7	0: Disabled 1: Enabled	0
MP tray mode	T0	0: Off (Cassette mode for FS-7000) 1: Manual feed overrides other paper sources (even during printing) (Effective after a printer reset) 2: Manual feed (FS-7000 only)	1
"OTHERS" paper size (FS-600 only)	T3	0: A5 1: B5	0
MP tray direction (FS-7000 only)	T8	0: Lengthwise 1: Widthwise	0
Paper thickness (Excl. FS-7000+/ FS-9000)	T9	0: Normal 1: Thick	0
Status page print at power-up	U5	0: Not printed automatically 1: Printed automatically at power-up	0
Default Courier font	V9	0: Dark 1: Light	0

Environment	Parameter	Value	Factory setting
Paper type settings for the MP tray	X0	1: Plain 2: Transparency 3: Preprinted 4: Label 5: Bond 6: Recycle 7: Vellum 8: Rough 9: Letterhead 10: Color 11: Prepunched 12: Envelope 13: Cardstock 21: Custom1 22: Custom2 23: Custom3 24: Custom4 25: Custom5 26: Custom6 27: Custom7 28: Custom8	8
Paper type settings for paper cassettes 1 through 6	X1 – X6	1: Plain 3: Preprinted 5: Bond 6: Recycled 8: Rough 9: Letterhead 10: Color 11: Prepunched 21: Custom1 22: Custom2 23: Custom3 24: Custom4 25: Custom5 26: Custom6 27: Custom7 28: Custom8	1

Environment	Parameter	Value	Factory setting
Paper type settings for Envelope Feeder (EF-1)/Universal Feeder (UF-1)	X7	1: Plain 3: Preprinted 4: Label 5: Bond 6: Recycled 8: Rough 9: Letterhead 10: Color 11: Prepunched 12: Envelope 13: Cardstock 21: Custom1 22: Custom2 23: Custom3 24: Custom4 25: Custom5 26: Custom6 27: Custom7 28: Custom8	8

Chapter 6

Emulation

Kyocera page printers emulate the operation of seven other widely used printers:

HP LaserJet (mode 6)
HP 7550A (mode 8)
IBM Proprinter X24E (mode 1)
Epson LQ-850 (mode 5)
Diablo 630 (mode 2)
Standard line printer (mode 0)
KPDL (mode 9) [an option on some models]

Word-processing and graphics software for any of the above printers also works with the page printer. All you need to do is to set the page printer to emulate the printer your software supports and select the appropriate printer driver.

In rare cases when your software does not support any of the printers above, install your software to drive the *standard* printer and use Prescribe 2e commands to control line spacing, character spacing, etc.

Inappropriate selection of software printer drivers and printer based emulations will produce undesirable results.

Note: **An option ROM is available for printers for which KPDL is supported as an option. With the upgrade kit installed, the printer can operate similar to the Apple LaserWriter II NT/NTX (mode 9). For purchase information about the upgrade kit, contact your Kyocera dealer. (The installation of the upgrade kit requires a qualified Kyocera technician.)**

HP LaserJet Emulation
In HP LaserJet emulation, each Kyocera model (series) emulates the following models (see the table on page iii):

When shipped from the factory, the printer is set to emulate the HP LaserJet. For best results, look for an FS-series printer driver in your software application.

You can also find the appropriate printer driver for your model in the Kyocera Digital Library CD-ROM supplied with the printer. Or, you are encouraged to visit our Internet home page to directly download the printer driver of the latest version.

Note: **If the FS-6500 printer is not supported as one of the printer drivers in your software application, choose HP LaserJet 4L (or LaserJet 4 in 300 dpi resolution mode).**

This chapter first explains how to select an emulation. Then it gives some general information applying to all the emulation modes. Finally, it goes over each of the modes, explaining the printer's word-processing capabilities and showing its character sets. Tables of control codes and escape sequences are also given at the end of each emulation section.

6.1. Selecting an Emulation

When installing the FS-series printer, you can select an emulation that best suits your needs. In most cases, the emulation will be the factory default setting (mode 6). Refer to the following diagram to locate the next level emulation in case you need to change the emulation.

For example, in printing environments using the HP plotter model HP 7550A (KC-GL), the user should select mode 8. In PostScript printing environments, mode 9 should be selected (an option on some models) .

To set an emulation mode, send the printer the FRPO commands listed in the table below.

Mode	Emulation	FRPO Commands
0	Line Printer	!R! FRPO P1, 0; FRPO P3, 1; EXIT;
1	IBM Proprinter X24E	!R! FRPO P1, 1; FRPO P3, 2; EXIT;
2	Diablo 630	!R! FRPO P1, 2; FRPO P3, 1; EXIT;
5	Epson LQ-850	!R! FRPO P1, 5; FRPO P3, 2; EXIT;
6	HP LaserJet	!R! FRPO P1, 6; FRPO P3, 1; EXIT;
8	HP 7550A	!R! FRPO P1, 8; FRPO P3, 1; EXIT;
9	KPDL	!R! FRPO P1, 9; EXIT;

Note: **The emulation mode can also be changed from the printer's control panel.**

Automatic emulation sensing

In printers that permit the selection of KPDL emulation, the automatic emulation sensing (AES) can be activated so that print jobs using other emulations will automatically print in the correct emulation. The KPDL option emulates the Apple LaserWriter II NTX. Refer to the AES related FRPO command parameters, P4, P5, P7, and P8 in *section 5.2.*, *Chapter 5*.

6.2. General Information on Emulation

The FS-series printer's capability for supporting seven printer emulations is remarkably complete; although a few differences are noteworthy.

- The page printer cannot print on paper larger than the size of its cassette. In particular, it cannot print on continuous forms.

- The 600 dpi resolution is supported only with HP LaserJet and KPDL emulations. Even for the models with 300/600 dpi support, printing occurs only with the 300 dpi resolution in Line Printer, IBM Proprinter, Diablo, and Epson emulation modes.

- The page printer's fonts do not duplicate the appearance of the fonts of the emulated printers exactly. For a fixed font, the page printer provides the same character spacing as the printer under emulation. This is not always true for proportional spacing. When proportional spacing is used, your word processing software, using an HP LaserJet driver, may be unable to properly right justify proportional text.

- The page printer supports scalable (outline) fonts. With the assistance of Prescribe 2e commands, the scalable fonts are available for printing in any one of the emulation modes. (See *Chapter 3* for details.)

- The graphics commands which create a path are also supported in all emulation modes. Instructions on how to create a path are described in *Chapter 1*.

- In all emulations, the page printer's margins differ slightly between emulations. The margins can be adjusted with Prescribe margin commands. However, they cannot be moved outside the paper edge limits.

- Prescribe commands can also be used for supplementary font control. Examples are given in each section.

6.3. Line Printer Emulation (Mode 0)

To set the power-up emulation for Line Printer, send the printer the following Prescribe command sequence:

```
!R! FRPO P1, 0 ; FRPO P3, 1; FRPO U6, 1; EXIT;
```

The Line Printer character set options are the same as for the IBM emulation. FRPO U6, 1 selects the full IBM US ASCII character set, which includes many international characters, graphic symbols, and mathematical symbols in addition to standard ASCII. If you leave the U6 parameter at its 0 factory setting, you will get a subset excluding some international characters and symbols. The other options are US Legal (`FRPO U6, 9;`) and the Danish character set (`FRPO U6, 4;`). See Section 6.4 for details.

The line printer emulation is virtually featureless. It uses only the control codes listed below.

Character code (decimal)	Abbreviation	Meaning
8	BS	Backspace
10	LF	Linefeed
12	FF	Formfeed
13	CR	Carriage return

Other control codes are ignored. In particular, the escape code (ESC: character code 27) is ignored. If the printer receives the escape sequence ESC A, for example, it ignores the escape code and prints the letter A. Therefore, this emulation requires Prescribe commands for controlling the printer.

In font mode (FTMD) 15, the printer automatically gives the innate character spacing, line spacing, and page orientation for each bitmap font, and character spacing and page orientation for each scalable font.

If a line overruns the right margin, word wrap occurs automatically in this emulation.

6.4. IBM Proprinter X24E Emulation (Mode 1)

To set the power-up emulation for IBM Proprinter X24E, send the printer the following Prescribe command sequence:

```
!R! FRPO P1, 1; FRPO P3, 2; EXIT;
```

The IBM symbol sets include IBM US plus international characters, mathematical symbols, Greek letters, and graphic symbols, so you can print things like:

$$\alpha \in \Sigma \cap \Omega \quad \delta\theta \approx 4GM/r_o c^2$$

Symbol sets PC-850, PC-860, PC-863, PC-865, US ASCII, and Denmark allow all ruling characters (hex B0 to DF) and underscore characters (5F) to be printed in the correct pitch for creating continuous lines.

The symbol set may be selected with the INTL command or the printer's control panel keys. Permanent setting of the symbol set is made with the FRPO U6 and U7 commands. See *Chapter 5* for instructions.

The following symbol sets list shows the support for the IBM emulation.

Symbol set	Message display	FRPO command
US ASCII	IBM US	FRPO U6, 0; FRPO U7, 1;
Denmark	IBM D/N	FRPO U6, 4; FRPO U7, 1;
US Legal	US Legal	FRPO U6, 9; FRPO U7, 1;
IBM PC-850 (Multilingual)	IBM PC-850	FRPO U6, 10; FRPO U7, 1;
IBM PC-860 (Portuguese)	IBM PC-860	FRPO U6, 11; FRPO U7, 1;
IBM PC-863 (Canadian French)	IBM PC-863	FRPO U6, 12; FRPO U7, 1;
IBM PC-865 (Norwegian)	IBM PC-865	FRPO U6, 13; FRPO U7, 1;

At power-up or after a reset, the printer defaults to **LetterGothic** (12 points)/**LetterGothicBM12-Roman** (10 cpi). This default font emulates the IBM printer's **Sans-serif 10cpi** font. The default font cannot be changed in the IBM emulation. (The FRPO C5, C2, and C3 commands will be ignored in the IBM emulation.)

The page printer also emulates three other IBM-printer fonts: **Courier, Prestige Elite, and Courier Proportional** (See the table on next page). These fonts can be obtained by embedded commands or by using a printer driver from your word-processing software that supports the IBM Proprinter X24E. No Prescribe 2e commands are needed. An embedded command gives double-wide versions and another give double-high version of all four fonts. Samples are shown below.

In the IBM emulation, you have five basic fonts to choose from. This is Draft Sans-serif, 10 cpi.

This is also Draft Sans-serif, but in 12 cpi.

This is Courier, 10 cpi.

This is PrestigeElite, 12 cpi.

This is Draft Sans-serif Condensed, or Courier Condensed.

This is Courier Proportional.

The IBM emulation supports embedded commands for double-wide/double-high printing, emphasized printing, double-strike printing, superscripts, subscripts, underlining, backspace, vertical and horizontal tabulation, line spacing, and paper length.

The font mode set for the IBM emulation is *0* (the printer adjusts nothing automatically for font attributes) unless you change it by the FTMD command. If you do not need exact character spacing, you can improve the appearance of some fonts by changing the font mode to 13.

```
!R! FTMD 13; EXIT;
```

It should be noted that for `FTMD 13;` the default Draft Sans-serif font will be printed in 12 cpi, and the Courier Proportional font will be printed in fixed pitch.

To use some of the page printer's other fonts, you can select them with font selection commands, but a more convenient method is available. You can substitute other fonts for the four embedded fonts with **SETF** (SET alternate Font) commands. This works because the page printer obtains these fonts from the following default values of the SETF command:

IBM font		**SETF default values**	
Font name	**Character spacing**	**ALTF No.**	**Font No.**
Draft Sans-serif	10 cpi, 12 cpi	0	8
Courier	10 cpi	1	1
Prestige Elite	12 cpi	2	6
Draft Sans-serif	Condensed	3	15
Courier			
Courier Prop.	Proportional	4	1

A substitute font can be a scalable font if you use the SFNT command to assign the font number. (See the SFNT command page in *Chapter 2*).

Note: **To assign a font number to scalable fonts for substituting the emulated fonts in IBM emulation, all the option parameters (including *symbol-set, compression,* and *angle*) for the SFNT command must be specified.**

Landscape orientation is another feature the page printer can offer that the IBM printer cannot. The fonts are limited in availability by the current page orientation. If you command `!R! SPO L; EXIT;` the printer rotates the current font and prints text in landscape orientation.

The page printer supports the IBM printer's bit-image graphics in portrait orientation, so graphics software using the IBM emulation will print charts, graphs, and pictures without the need for Prescribe 2e commands. The print model and clipping features of the Prescribe 2e path mode graphics will be ignored with the IBM bit-image graphics, however.

If you attempt to print beyond the right margin, the characters will wrap around and print on the next line.

IBM Proprinter X24E Control Codes

Command	Function	Code (hex)	Supported
BEL	Beeper	07	–
BS	Backspace	08	Yes
HT	Horizontal Tab	09	Yes
LF	Line Feed	0A	Yes
VT	Vertical Tab	0B	Yes
FF	Form Feed	0C	Yes
CR	Carriage Return	0D	Yes
SO	Double-Wide Printing by line	0E	Yes
SI	Condensed Printing	0F	Yes
DC1	Select Printer	11	–
DC2	10 CPI Print	12	Yes
DC4	Cancel Double-Wide Printing by line	14	Yes
CAN	Cancel Data	18	–
ESC * m n1 n2 data	Select Graphic Mode (AGM only)	1B 2A m n1 n2 data	–
ESC - n	Continuous Underline	1B 2D n	Yes
ESC 0	$^{1}/_{8}$ Inch Line Spacing	1B 30	Yes
ESC 1	$^{7}/_{72}$ Inch Line Spacing	1B 31	Yes
ESC 2	Start Text Line Spacing	1B 32	Yes
ESC 3 n	Graphics Line Spacing	1B 33 n	Yes
ESC 4	Set Top of Form	1B 34	Yes
ESC 5 n	Automatic Line Feed	1B 35 n	Yes
ESC 6	Select Character Set 2	1B 36	Yes
ESC 7	Select Character Set 1	1B 37	Yes
ESC :	12 CPI Printing	1B 3A	Yes
ESC =	Character Font Image Download	1B 3D	–
ESC A n	Set Text Line Spacing	1B 41 n	Yes
ESC B n1 n2...n64 null	Set Vertical Tabs	1B 42 n1 n2...n64 0	Yes
ESC C n m	Set Form Length in Line or Inches	1B 43 nm	Yes
ESC D n1 n2...n29 null	Set Horizontal Tabs	1B 44 n1 n2...n28 0	Yes
ESC E	Emphasized Printing	1B 45	Yes
ESC F	Cancel Emphasized Printing	1B 46	Yes
ESC G	Double-Strike printing	1B 47	Yes
ESC H	Cancel Double-Strike Printing	1B 48	Yes
ESC I n	Select Print Mode	1B 49 n	Yes
ESC J n	Graphics Variable Line Spacing	1B 4A n	Yes
ESC K n1 n2 v1 v2...vn	Normal-Density Bit-Image Graphics	1B 4B n1 n2 v1 v2...vn	Yes
ESC L n1 n2 v1 v2...vn	Dual-Density Bit-Image Graphics (Half-Speed)	1B 4C n1 n2 v1 v2...vn	Yes
ESC N n	Set Automatic Perforation Skip	1B 4E n	Yes

Command	Function	Code (hex)	Supported
ESC O	Cancel Automatic Perforation Skip	1B 4F	Yes
ESC P n	Proportional Space Mode	1B 50 n	Yes
ESC Q n	Deselect Printer	1B 51 n	–
ESC R	Set All Tabs to Power on Settings	1B 52	Yes
ESC S n	Subscript or Superscript Printing	1B 53 n	Yes
ESC T	Cancel Subscript or Superscript	1B 54	Yes
ESC U n	Set Print Direction	1B 55 n	–
ESC W n	Continuous Double-Wide Printing	1B 57 n	Yes
ESC X n m	Set Horizontal Margins	1B 58 n m	Yes
ESC Y n1 n2 v1 v2...vn	Dual-Density Bit-Image Graphics (Normal Speed)	1B 59 n1 n2 v1 v2...vn	Yes
ESC Z n1 n2 v1 v2...vn	High-Density Bit-Image Graphics	1B 5A n1 n2 v1 v2...vn	Yes
ESC [@ n1 n2 m1 m2 m3 m4	Double-High Printing	1B 5B 40 n1 n2 m1 m2 m3 m4	Yes
ESC [K n1 n2 in id p1 p2	Set Initial Condition	1B 5B 4B n1 n2 in id p1 p2	Yes
ESC [T n1 n2 0 0 c1 c2	Set Code Page	1B 5B 54 n1 n2 0 0 c1 c2	Yes
ESC [\ n1 n2 t1 t2 g1 g2	Set Vertical Unit	1B 5B 7C n1 n2 t1 t2 g1 g2	Yes
ESC [g n1 n2 m data	High-Resolution Graphics	1B 5B 67 n1 n2 m data	Yes
ESC \ n1 n2	Print Continuously From All Characters Chart	1B 7C n1 n2	Yes
ESC ^	Print Single Character from All Characters Chart	1B 5E	Yes
ESC_n	Continuous Overline	1B 2D n	Yes
ESC d n1 n2	Relative Move Inline Forward	1B 64 n1 n2	Yes
ESC j	Stop Printing	1B 6A	–
ESC e n1 n2	Relative Mode Inline Backward	1B 65 n1 n2	Yes

IBM Symbol Set

IBM symbol set PC-8

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	⣿ 176	└ 192	╩ 208	α 224	≡ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▒ 177	┴ 193	╥ 209	β 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	╫ 178	┬ 194	╦ 210	Γ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	╠ 211	π 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	θ 233	• 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	¢ 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	n 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	ì 141	¥ 157	¡ 173	╩ 189	═ 205	▌ 221	φ 237	² 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	₧ 158	« 174	╛ 190	╬ 206	▐ 222	∈ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	▒ 127	Å 143	ƒ 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	255

IBM symbol set PC-8 (D/N)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	░ 176	└ 192	╨ 208	α 224	≡ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▒ 177	┴ 193	╤ 209	β 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	θ 233	• 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	ø 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	n 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	ì 141	Ø 157	¡ 173	╜ 189	═ 205	▌ 221	φ 237	2 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	Ł 158	³ 174	╛ 190	╬ 206	▐ 222	∈ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	▒ 127	Å 143	ł 159	¤ 175	┐ 191	╧ 207	▀ 223	∩ 239	255

IBM symbol set PC-850

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	░ 176	└ 192	ð 208	Ó 224	– 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▒ 177	┴ 193	Ð 209	ß 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	▓ 178	┬ 194	Ê 210	Ô 226	‗ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	Ë 211	Ò 227	¾ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	È 212	õ 228	¶ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	Á 181	┼ 197	ı 213	Õ 229	§ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	ª 166	Â 182	ã 198	Í 214	µ 230	÷ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	º 167	À 183	Ã 199	Î 215	þ 231	¸ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	ÿ 152	¿ 168	© 184	╚ 200	Ï 216	Þ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	® 169	╣ 185	╔ 201	┘ 217	Ú 233	¨ 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Û 234	• 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	ø 155	½ 171	╗ 187	╦ 203	█ 219	Ù 235	¹ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	ý 236	³ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	ì 141	Ø 157	¡ 173	¢ 189	═ 205	¦ 221	Ý 237	² 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	× 158	« 174	¥ 190	╬ 206	Ì 222	¯ 238	▌ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	▒ 127	Å 143	ƒ 159	» 175	┐ 191	¤ 207	▀ 223	´ 239	255

IBM symbol set PC-860

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	⣿ 176	└ 192	╨ 208	α 224	≡ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	À 145	í 161	▒ 177	┴ 193	╥ 209	β 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	È 146	ó 162	╬ 178	┬ 194	╤ 210	Γ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ã 132	õ 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	Ã 134	Ú 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	Ì 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	Ê 137	Õ 153	Ò 169	╣ 185	╔ 201	┘ 217	θ 233	• 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	Í 139	¢ 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	Ô 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	ⁿ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	ì 141	Ù 157	¡ 173	╜ 189	═ 205	▌ 221	ϕ 237	² 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ã 142	₧ 158	« 174	╛ 190	╬ 206	▐ 222	∈ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	▒ 127	Â 143	Ó 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	255

IBM symbol set PC-863

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	| 160	⣿ 176	└ 192	╨ 208	α 224	≡ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	È 145	´ 161	▒ 177	┴ 193	╤ 209	β 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Ê 146	ó 162	╫ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	Â 132	Ë 148	¨ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	Ï 149	¸ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	¶ 134	û 150	³ 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ú 151	¯ 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	¤ 152	Î 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ô 153	⌐ 169	╣ 185	╔ 201	┘ 217	θ 233	• 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	¢ 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	ⁿ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	‗ 141	Ù 157	¾ 173	╜ 189	═ 205	▌ 221	ϕ 237	² 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	À 142	Û 158	« 174	╛ 190	╬ 206	▐ 222	∈ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	▒ 127	§ 143	ƒ 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	255

IBM symbol set PC-865

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	⣿ 176	└ 192	╨ 208	α 224	≡ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▒ 177	┴ 193	╤ 209	β 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	╬ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ú 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	θ 233	• 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	ø 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	ⁿ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	ì 141	Ø 157	¡ 173	╜ 189	═ 205	▌ 221	φ 237	² 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	₧ 158	« 174	╛ 190	╬ 206	▐ 222	∈ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	▓ 127	Å 143	ƒ 159	¤ 175	┐ 191	╧ 207	▀ 223	∩ 239	255

6.5. Diablo 630 Emulation (Mode 2)

To set the power-up emulation for Diablo 630, send the printer the following Prescribe command sequence:

```
!R! FRPO P1, 2; FRPO P3, 1; EXIT;
```

The page printer uses ten symbol sets in the Diablo emulation as shown below. To select one of these character sets, use the INTL command or the printer's control panel keys. Permanent setting of the symbol set is made with the FRPO U6 and U7 parameters. The factory setting for the character set at power-up is **DIABLO US.**

Symbol set	Message display	FRPO commands
US	DIABLO US	FRPO U6, 0; FRPO U7, 2;
France	DIABLO France	FRPO U6, 1; FRPO U7, 2;
Germany	DIABLO Germany	FRPO U6, 2; FRPO U7, 2;
UK	DIABLO U.K.	FRPO U6, 3; FRPO U7, 2;
Denmark	DIABLO Denmark	FRPO U6, 4; FRPO U7, 2;
Sweden	DIABLO Sweden	FRPO U6, 5; FRPO U7, 2;
Italy	DIABLO Italy	FRPO U6, 6; FRPO U7, 2;
Spain	DIABLO Spain	FRPO U6, 7; FRPO U7, 2;
Japan	DIABLO Japan	FRPO U6, 8; FRPO U7, 2;
US Legal	US Legal	FRPO U6, 9; FRPO U7, 2;

The U0—U3 parameters of the FRPO command will be ignored in the Diablo emulation. The line and character spacing are always 6 lines and 10 characters per inch at power-up and after a reset.

In Diablo emulation, the page printer supports the embedded commands of word-processing software essentially the same way as the Diablo 630 printer does for the following features:

- Margins
- Horizontal and vertical tabulation
- Line and character spacing, including proportional spacing
- Half line feed, reverse line feed, and reverse half line feed
- Backspace and fine backspace
- Bold (shadow), double-strike, and underlining
- Graphics mode

Note: **If you attempt to print beyond the right margin, the characters will not be printed.**

A feature the page printer has that the Diablo does not is the landscape orientation. To print in landscape orientation, send the command SPO L; and select a landscape font.

Example:
To print in landscape with CourierBM12-Roman bitmap font, send the following command:

```
!R! SPO L; FONT 17; EXIT;
```

Note: **The automatic centering, justification and Hyplot mode of the Diablo printer are not supported.**

Fonts can be selected by placing font commands in the file to be printed, or using SETF (set alternate font) and ALTF (change to alternate font). To substitute scalable fonts for the embedded fonts using SETF command, employ the FSET command to apply the appropriate font number for that scalable font. The default font mode (FTMD) is 0, so the printer will not adjust character spacing, line spacing, or page orientation.

The red/black ribbon feature of the Diablo 630 printer is implemented in an interesting way. The printer translates the black ribbon command internally into an ALTF 0 command, and the red ribbon command into an ALTF 1 command. It also uses two pairs of SETF default values:

Ribbon color	Page printer (bitmap) font	SETF default value
Black	CourierBM12-Roman	SETF 0, 1;
Red	Dutch 801BM10-Roman	SETF 1, 2;

Accordingly, if you use the embedded command that asks for red ribbon, you will get font 2: Dutch801BM-Roman. This font is proportionally spaced, so you should also specify proportional spacing with an embedded command. When you change back to black ribbon, the printer changes to font 1: CourierBM12-Roman.

With SETF commands you can select any two fonts you like, whether they are bitmapped or scalable, which correspond to the black and red ribbons. For example, you can have black mean normal Dutch801BM10-Roman and red mean Dutch801BM10-Italic. The appropriate setup is shown below, together with a short file and the printed result.

```
!R! FTMD 13; CMNT For proportionl spacing;
    SETF 1, 3; CMNT Red: Dutch801BM10-Italic;
    ALTF 1; SFA .05, .1667, P;
    SETF 0, 2; CMNT Black: Dutch801BM10-Roman;
    ALTF 0; SFA .05, .1667, P;
    CMNT .05 = size of space character;
EXIT;

  10,000 Maniacs: Our Time in Eden (Elektra)
  Garth Brooks: The Chase (Liberty)
  Red Hot Chill Peppers: What Hits!? (EMI)
```

For red-ribbon, put ESC A at the point you would start to print in Dut801BM10-Roman, and put ESC B at the point to end using the font.

Printout:

10,000 Maniacs: *Our Time in Eden* (Elektra)
Garth Brooks: *The Chase* (Liberty)
Red Hot Chill Peppers: *What Hits!?* (EMI)

FTMD 13 ensures correct proportional character spacing. The SFA (Set Font Attributes) commands adjust the size of the space character to 0.05 inches, to give a pleasing inter-word spacing. Without SFA, the words would be closer together. With the embedded software command for proportional spacing instead of FTMD 13, the words would be farther apart.

Diablo 630 Control Codes

Command	Function	Code (hex)	Supported
NUL	Buffer code	00	Yes
ETX	End of text	03	Yes
ACK	Acknowledge	06	Yes
BEL	Sound bell	07	–
BS	Backspace	08	Yes
HT	Horizontal tab	09	Yes
LF	Line feed	0A	Yes
VT	Vertical tab	0B	Yes
FF	Form feed	0C	Yes
CR	Carriage return	0D	Yes
SO	Supplementary extended character set	0E	–
SI	Primary extended character set	0F	–
DC1	XON	11	Yes
DC2	Enter printwheel table download mode	12	–
DC3	XOFF	13	Yes
DC4	Exit printwheel table download mode	14	–
NAK	Printer error condition	15	Yes
EM	Access supplementary character set	19	–
DEL	Same as NUL	7F	Yes
ESC BS	Backspace $^{1}/_{120}$ inch	1B 08	Yes
ESC HT n	Absolute horizontal tab to column n	1B 09 n	Yes
ESC LF	Reverse line feed	1B 0A	Yes
ESC VT n	Absolute vertical tab to line n	1B 0B n	Yes
ESC FF n	Set n lines per page	1B 0C n	Yes
ESC CR P	Remote reset	1B 0D 50	Yes
ESC SO DC2	Enter printwheel table download mode	1B 0E 12	–
ESC SO M	Enter program mode	1B 0E 4D	–
ESC DC1 n	Set offset to n	1B 11 n	Yes
ESC SYN n	Select printwheel type	1B 16 n	–
ESC EM 1	Upper cassette (for sheet 1)	1B 19 31	Yes
ESC EM 2	Lower cassette (for sheet 2)	1B 19 32	Yes
ESC EM E	Manual paper feed (for envelope)	1B 19 45	Yes
ESC EM R	Eject page	1B 19 52	Yes
ESC SUB SO	Memory test	1B 1A 0E	–
ESC SUB 1	Request status byte 1	1B 1A 31	–
ESC SUB 3	Request status byte 3	1B 1A 33	–
ESC SUB I	Initialize printer	1B 1A 49	Yes
ESC SUB R	Remote error reset	1B 1A 52	–
ESC GS A	Disable NAK error response from printer	1B 1D 41	–
ESC GS B	Reenable NAK error response from printer	1B 1D 42	–
ESC RS n	Set (n-1)/48-inch line spacing	1B 1E n	Yes
ESC US n	Set (n-1)/120-inch character spacing	1B 1F n	Yes
ESC %	Increase carriage setting time	1B 25	–

Command	Function	Code (hex)	Supported
ESC &	Bold and shadow printing OFF	1B 26	Yes
ESC ,	Set plot precision	1B 2C	–
ESC -	Set vertical tab at current position	1B 2D	Yes
ESC . n	Change plot character	1B 2E n	–
ESC /	Auto backward printing ON	1B 2F	–
ESC \	Auto backward printing OFF	1B 5C	–
ESC 0	Set right margin at current position	1B 30	Yes
ESC 1	Set horizontal tab at current position	1B 31	Yes
ESC 2	Clear all vertical and horizontal tabs	1B 32	Yes
ESC 3	Graphics mode ON	1B 33	Yes
ESC 4	Graphics mode OFF	1B 34	Yes
ESC 5	Forward printing mode	1B 35	Yes
ESC 6	Backward printing mode	1B 36	Yes
ESC 7	Print suppression	1B 37	–
ESC 8	Clear horizontal tab at current position	1B 38	Yes
ESC 9	Set left margin at current position	1B 39	Yes
ESC <	Reverse printing mode ON	1B 3C	–
ESC >	Reverse printing mode OFF	1B 3E	–
ESC =	Auto-center	1B 3D	–
ESC ?	Auto carriage return ON	1B 3F	Yes
ESC !	Auto carriage return OFF	1B 21	Yes
ESC A	Alternate font 1 (for red ribbon)	1B 41	Yes
ESC B	Alternate font 0 (for black ribbon)	1B 42	Yes
ESC C	Clear top and bottom margins	1B 43	Yes
ESC D	Reverse half linefeed	1B 44	Yes
ESC E	Underline ON	1B 45	Yes
ESC G	Hyplot ON–absolute move	1B 47	–
ESC G BEL	Hyplot ON–absolute plot	1B 47 07	–
ESC L	Set bottom margin at current position	1B 4C	Yes
ESC M	Auto-justify	1B 4D	–
ESC N	Restore normal carriage settling time	1B 4E	–
ESC O	Bold printing ON	1B 4F	Yes
ESC P	Proportional spacing ON	1B 50	Yes
ESC Q	Proportional spacing OFF	1B 51	Yes
ESC R	Underline OFF	1B 52	Yes
ESC S	Reset character spacing	1B 53	Yes
ESC T	Set top margin at current position	1B 54	Yes
ESC U	Half linefeed	1B 55	Yes
ESC V	Hyplot ON–relative move	1B 56	–
ESC V BEL	Hyplot–relative plot	1B 56 07	–
ESC W	Shadow printing ON	1B 57	Yes
ESC X	Bold, shadow, and underline OFF	1B 58	Yes
ESC Y	Printwheel spoke-0 character	1B 59	–
ESC Z	Printwheel spoke-95 character	1B 5A	–

Diablo 630 Symbol Sets

US ASCII

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	‘ 96	p 112	128	144	160	¯ 176	â 192	Å 208	Á 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	• 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Ð 227	µ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	– 246
7	7	23	’ 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	¦ 124	140	156	˜ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	Û 174	ƒ 190	ö 206	ß 222	Ÿ 238	± 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▒ 127	143	159	£ 175	¢ 191	ü 207	Ô 223	ÿ 239	255

Diablo 630 US Legal

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	° 96	p 112	128	144	160	— 176	â 192	Å 208	Á 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	• 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Ð 227	µ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	– 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	[91	k 107	§ 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	= 60	L 76	® 92	l 108	¶ 124	140	156	˜ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	13	29	- 45	= 61	M 77	] 93	m 109	† 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	¢ 62	N 78	© 94	n 110	™ 126	142	158	Û 174	ƒ 190	ö 206	ß 222	Ÿ 238	± 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▒ 127	143	159	£ 175	¢ 191	ü 207	Ô 223	ÿ 239	255

Diablo 630 International Characters

	HEX	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
	DEC	35	36	64	91	92	93	94	96	123	124	125	126
Diablo USA	0	#	$	@	[	\	]	^	`	{	¦	}	~
Diablo France	1	£	$	à	°	ç	§	^	`	é	ù	è	¨
Diablo Germany	2	£	$	ß	Ä	Ö	Ü	^	`	ä	ö	ü	~
Diablo United Kingdom	3	£	$	@	[	\	]	^	`	{	¦	}	¯
Diablo Denmark	4	£	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
Diablo Sweden	5	#	$	@	Ä	Ö	Å	^	`	ä	ö	å	~
Diablo Italy	6	£	$	`	°	ç	§	^	½	é	ù	è	¨
Diablo Spain	7	£	$	§	¡	Ñ	¿	^	`	°	ñ	ç	~
Diablo Japan	8	#	$	@	[	¥	]	^	`	{	¦	}	~

6.6. Epson LQ-850 Emulation (Mode 5)

To set printer to power up in the LQ-850 emulation with the LQ German symbol set, command:

```
!R! FRPO P1, 5; FRPO P3, 2; FRPO U6, 2; EXIT;
```

The Epson LQ-850 emulation uses 13 symbol sets that include both plain and italic characters. The desired symbol set can be selected with the U6 parameter of the FRPO command or changed temporarily with the INTL command or from the control panel.

The page printer supports the following Epson symbol sets. Tables of the basic symbols are given at the end of this section.

Symbol set	Message display	FRPO commands
U.S.A.	LQ US	FRPO U6, 0; FRPO U7, 0;
France	LQ France	FRPO U6, 1; FRPO U7, 0;
Germany	LQ Germany	FRPO U6, 2; FRPO U7, 0;
U.K.	LQ U.K.	FRPO U6, 3; FRPO U7, 0;
Denmark 1	LQ Denmark	FRPO U6, 4; FRPO U7, 0;
Sweden	LQ Sweden	FRPO U6, 5; FRPO U7, 0;
Italy	LQ Italy	FRPO U6, 6; FRPO U7, 0;
Spain 1	LQ Spain	FRPO U6, 7; FRPO U7, 0;
Japan	LQ Japan	FRPO U6, 8; FRPO U7, 0;
Norway	LQ Norway	FRPO U6, 14; FRPO U7, 0;
Denmark II	LQ Denmark2	FRPO U6, 15; FRPO U7, 0;
Spain II	LQ Spain2	FRPO U6, 16; FRPO U7, 0;
Latin America	LQ Latin America	FRPO U6, 17; FRPO U7, 0;

The FS-series printers support the Epson graphics character sets (code page tables) of PC 437 (Epson Extended Graphics), PC 850 (Multilingual), PC 860 (Portugal), PC 863 (Canada-French), and PC 865 (Norway). These sets are available only through the use of Epson control codes or the operation of the printer's control panel. See the User's Manual. Another Epson control code also provides the US Legal character set. The Korean character set is not supported.

When power is first switched on or after a reset, the page printer always defaults in the **CourierBM12-Roman** font (10 cpi). This default font emulates LQ-850's **Draft, 10 cpi** and cannot be changed for the LQ-850 emulation.

The page printer also emulates the other four LQ-850 fonts (five in all). These fonts can be selected by embedded commands in the word processing software or using an Epson LQ-850 printer driver. Double-wide and double-high effects are available for all five fonts.

This is Draft/Epson Courier font, 10 cpi. Various and condensed picthes are available.

This is Epson Roman, 10 cpi. The printer emulates this font in 10 cpi with Dutch801BM.

This is Epson Sans Serif. Various picthes are also available.

This is Epson Prestige. The printer uses PresetigeElite and LinePrinter fonts.

The five LQ-850 fonts actually use the page printer's resident fonts. The font mode in the Epson emulation is *0*. (The printer does not automatically adjust character spacing.) If you do not need exact character spacing, you can improve the appearance of these fonts by changing to font mode 13. The printer generates double-wide and double-high effects for these emulating fonts.

To use other page printer fonts, select them with font commands (FONT, SFNT, and FSET). Since the printer emulates certain LQ-850 fonts in different spacings by using the same resident font, it should be noted that substituting one font will also change the other fonts emulated by that font. For example, if you change the Draft 15 cpi font which is emulated by the PrestigeEliteBM7.2-Roman font, this will also affect the other 15 cpi LQ-850 fonts using the same ALTF 7; setting.

Epson LQ-850 fonts		SETF default values	
Font name	**Character spacing**	**ALTF No.**	**Font No.**
Draft/Epson Courier	10 cpi, Proportional	0	1
	12 cpi	1	6
	15 cpi	7	7
	Condensed 10 cpi	8	15
	Condensed 12 cpi, Condensed proportional	9	16
Epson Roman	10 cpi, proportional	2	2
	12 cpi	3	5
	15 cpi	7	7
	Condensed 10 cpi	8	15
	Condensed 12 cpi, Condensed proportional	9	16
Epson Sans Serif	10 cpi, 12 cpi, proportional	4	8
	15 cpi	5	15
	Condensed 10 cpi	8	15
	Condensed 12 cpi, Condensed proportional	9	16
Epson Prestige	10 cpi, 12 cpi, Proportional	6	6
	15 cpi	7	7
	Condensed 10 cpi	8	15
	Condensed 12 cpi, Condensed proportional	9	16

You can alter these default SETF assignments to suit your own purposes. In the example below, four of the SETF assignments are changed to proportional fonts, and the font mode is changed to 15. The sample text is then printed by selecting pica for the title, elite for the first paragraph, compressed for the second paragraph, compressed elite for the third paragraph, and elite for the last paragraph.

```
!R! SETF 0, 12; CMNT Draft 10cpi: Swiss721BM12-Bold;
    SETF 1,  2; CMNT Draft 12cpi: Dutch801BM10-Roman;
    SETF 7, 13; CMNT Draft 15cpi: Swiss721BM8-Roman;
    SETF 8, 14; CMNT Condensed 10cpi: Swiss721BM6-Roman;
EXIT;
```

To select a scalable font for the SETF assignments, first assign a font number to the scalable font by sending the command SFNT commands to the printer as shown below. The font number assigned should not duplicate a number already in use.

```
!R! SFNT 'Swiss742SWC-Bold',  12, 3000, 277, 1, 0;
    SFNT 'Dutch801SWC-Roman', 10, 3001, 277, 1, 0;
    SFNT 'Swiss742SWC-Roman',  8, 3002, 277, 1, 0;
    SFNT 'Swiss742SWC-Roman',  6, 3003, 277, 1, 0;
EXIT;
```

Note: **All option parameters for SFNT (including *symbol-set, compression,* and *angle*) are required for assigning font numbers to a scalable font when altering the SETF assignments for the Epson emulation.**

Landscape printing is possible in the LQ-850 mode. If you send the command `!R! SPOL; EXIT;` the printer rotates fonts and prints them in landscape orientation.

In portrait orientation, the page printer supports Epson bit-image graphics, so with graphics software for the LQ-850 printer, you can use it to print charts, graphs, and pictures. The 9-bit graphics mode is also supported.

If you attempt to print beyond the right margin, the characters wrap around and are printed on the next line.

EPSON LQ-850 Control Codes

Printer Operation

Command	Function	Code (hex)	Supported
ESC @	Initialize Printer	1B 40	Yes
DC 1	Select Printer	11	–
DC 3	Deselect Printer	13	–
DEL	Delete Character	7F	–
ESC <	Select Unidirectional Mode (one line)	1B 3C	Yes
ESC U n	Turn Unidirectional Mode On/Off	1B 55	–
ESC EM n	Control Cut Sheet Feeder	1B 19	–

MSB Control

Command	Function	Code (hex)	Supported
ESC =	Set MSB to 0	1B 3D	Yes
ESC >	Set MSB to 1	1B 3E	Yes
ESC #	Cancel MSB Control	1B 35	Yes
BEL	Beeper	07	–

Data Control

Command	Function	Code (hex)	Supported
CR	Carriage Return	0D	Yes
CAN	Cancel Line	18	–

Vertical Motion

Command	Function	Code (hex)	Supported
FF	Form feed	0C	Yes
ESC C n	Set Page Length in Lines	1B 43	Yes
ESC C null n	Set Page Length in Inches	1B 43 00	Yes
ESC N n	Set Skip Over Perforation	1B 4E	Yes
ESC O	Cancel Skip Over Perforation	1B 4F	Yes
LF	Line Feed	0A	Yes
ESC + n	Set n/360-inch Line Spacing	1B 2B	Yes
ESC 0	Select 1/8-inch Line Spacing	1B 30	Yes
ESC 2	Select 1/6-inch Line Spacing	1B 32	Yes
ESC 3 n	Set n/180-inch Line Spacing	1B 33	Yes
ESC A n	Set n/60-inch Line Spacing	1B 41	Yes
ESC J n	Perform n/180-inch Line Feed	1B 4A	Yes
VT	Tab Vertically	0B	Yes
ESC B n1 n2...n16 null	Set Vertical Tabs	1B 42	Yes
ESC b n1 n2...n16 null	Set Vertical Tabs in Channels	1B 62	Yes
ESC / n	Select Vertical Tab Channel	1B 2F	Yes

Horizontal Motion

Command	Function	Code (hex)	Supported
ESC *l* n	Set Left Margin	1B 6C	Yes
ESC Q n	Set Right Margin	1B 51	Yes
BS	Backspace	08	Yes
ESC $ n1 n2	Set Absolute Print Position	1B 24	Yes
ESC \ n1 n2	Set Relative Print Position	1B 5C	Yes
HT	Tab Horizontally	09	Yes
ESC D n1 n2...n32 null	Set Horizontal Tabs	1B 44	Yes

Overall Printing Style

Command	Function	Code (hex)	Supported
ESC x n	Select Letter Quality or Draft	1B 78	Yes
ESC k n	Select Typestyle Family	1B 6B	Yes
ESC ! n	Master Select	1B 21	Yes

Print Size and Character Width

Command	Function	Code (hex)	Supported
ESC P	Select 10 CPI	1B 50	Yes
ESC M	Select 12 CPI	1B 4D	Yes
ESC g	Select 15 CPI	1B 67	Yes
ESC p n	Turn Proportional Mode On/Off	1B 70	Yes
SI	Select Condensed Mode	0F	Yes
ESC SI	Select Condensed Mode	1B 0F	Yes
DC2	Cancel Condensed Mode	12	Yes
SO	Select Double-wide Mode (one line)	0E	Yes
ESC SO	Select Double-wide Mode (one line)	1B 0E	Yes
ESC W n	Turn Double-wide Mode On/Off	1B 57	Yes
DC4	Cancel Double-wide Mode (one line)	14	Yes
ESC w n	Turn Double-high Mode On/Off	1B 77	Yes

Print Enhancement

Command	Function	Code (hex)	Supported
ESC E	Select Emphasized Mode	1B 45	Yes
ESC F	Cancel Emphasized Mode	1B 46	Yes
ESC G	Select Double-strike Mode	1B 47	Yes
ESC H	Cancel Double-strike Mode	1B 48	Yes
ESC S n	Select Superscript or Subscript	1B 53	Yes
ESC T	Cancel Superscript/Subscript Mode	1B 54	Yes
ESC (- n1 n2 m d1 d2	Select Score	1B 28 2D	Yes
ESC - n	Turn Underline Mode On/Off	1B 2D	Yes
ESC q	Select Character Style	1B 67	Yes

Word Processing

Command	Function	Code (hex)	Supported
ESC a n	Select Justification	1B 61	–
ESC SP n	Set Intercharacter Space	1B 20	Yes

Character Tables

Command	Function	Code (hex)	Supported
ESC t n	Select Character Set	1B 74	Yes
ESC 4	Select Italic Mode	1B 34	Yes
ESC 5	Cancel Italic Mode	1B 35	Yes
ESC R	Select an International Character Set	1B 52	Yes

User-defined Characters

Command	Function	Code (hex)	Supported
ESC & null d1 d2...dn	Define User-defined Characters	1B 26	–
ESC : null n null	Copy ROM to RAM	1B 3A	–
ESC % n	Select User-defined Set	1B 25	–
ESC 6	Enable Printable Characters	1B 36	Yes
ESC 7	Enable Upper Control Codes	1B 37	Yes

Graphics

Command	Function	Code (hex)	Supported
ESC K n1 n2 v1 v2...vn	Select Single-density Graphics Mode	1B 4B	Yes
ESC L n1 n2 v1 v2...vn	Select Double-density Graphics Mode	1B 4C	Yes
ESC Y n1 n2 v1 v2...vn	Select High-speed Double-density Graphics Mode	1B 59	Yes
ESC Z n1 n2 v1 v2...vn	Select Quadruple-density Graphics Mode	1B 5A	Yes
ESC * m n1 n2 v1 v2...vn	Select Graphics Mode	1B 2A	Yes
ESC ? m n	Reassign Graphics Mode	1B 3F	Yes

LQ-850 Symbol Sets

LQ-850 US ASCII

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	à 0	§ 16	 32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	⠿ 176	└ 192	╨ 208	α 224	≡ 240
1	è 1	β 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▒ 177	┴ 193	╤ 209	β 225	± 241
2	ù 2	Æ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	ò 3	æ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	ì 4	Ø 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	° 5	ø 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	£ 6	¨ 22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	¡ 7	Ä 23	´ 39	7 55	G 71	W 87	g 103	w 119	Ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	¿ 8	Ö 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	Ñ 9	Ü 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	╘ 217	θ 233	• 249
A	ñ 10	ä 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	╗ 186	╩ 202	┌ 218	Ω 234	• 250
B	¤ 11	ö 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	¢ 155	½ 171	╝ 187	╦ 203	□ 219	δ 235	√ 251
C	₧ 12	ü 28	, 44	< 60	L 76	\ 92	l 108	¦ 124	î 140	£ 156	¼ 172	╜ 188	╠ 204	■ 220	∞ 236	n 252
D	Å 13	É 29	- 45	= 61	M 77	] 93	m 109	} 125	ì 141	¥ 157	¡ 173	╛ 189	═ 205	▌ 221	ϕ 237	² 253
E	å 14	é 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	₧ 158	« 174	╘ 190	╬ 206	▐ 222	∈ 238	■ 254
F	ç 15	¥ 31	/ 47	? 63	O 79	_ 95	o 111	▒ 127	Å 143	ƒ 159	» 175	╖ 191	╧ 207	▀ 223	∩ 239	 255

LQ-850 international symbol set

	HEX	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
	DEC	35	36	64	91	92	93	94	96	123	124	125	126
LQ USA	0	#	$	@	[	\	]	^	`	{	¦	}	~
LQ France	1	#	$	à	°	ç	§	^	`	é	ù	è	¨
LQ Germany	2	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
LQ United Kingdom	3	£	$	@	[	\	]	^	`	{	¦	}	~
LQ Denmark	4	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
LQ Sweden	5	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
LQ Italy	6	#	$	@	°	\	é	^	ù	à	ò	è	ì
LQ Spain	7	Pt	$	@	¡	Ñ	¿	^	`	¨	ñ	}	~
LQ Japan	8	#	$	@	[	¥	]	^	`	{	¦	}	~
LQ Norway	14	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
LQ Denmark 2	15	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
LQ Spain 2	16	#	$	á	¡	Ñ	¿	é	`	í	ñ	ó	ú
LQ Latin America	17	#	$	á	¡	Ñ	¿	é	ü	í	ñ	ó	ú

6.7. HP LaserJet Emulation (Mode 6)

On shipment from the factory, the printer is set to power up in the HP LaserJet (PCL 6) emulation for the following models:

Item	FS-400/1550/ 3400	FS-600/680	FS-800	FS-1200	FS-1600/ 3600	FS-1700/ 3700
HP Emulation	HP LaserJet III	HP LaserJet 5P	HP LaserJet 5Si	HP LaserJet 4000	HP LaserJet 4	HP LaserJet 4 Plus
Printer Language	PCL5	PCL5E	PCL5E	PCL6	PCL5E	PCL5E
HP PJL	None	Supported	Supported	Supported	Supported	Supported
Printer Resolution	300 dpi	300/600 dpi	300/600 dpi	300/600 dpi	300/600 dpi	300/600 dpi
Standard Fonts (Resident Fonts)	79 Bitmap 45 Scalable	80 Bitmap 45 Scalable	80 Bitmap 45 Scalable 35 KPDL	1 Bitmap 80 Scalable 80 KPDL	79 Bitmap 45 Scalable	79 Bitmap 45 Scalable
Resource Saving	None	Supported	Supported	Supported	Supported	Supported

Item	FS-1700+/ 3700+/6700	FS-1750/ 3750	FS-6500	FS-7000	FS-7000+/ 9000
HP Emulation	HP LaserJet 5M	HP LaserJet 4000	HP LaserJet 4	HP LaserJet 5Si	HP LaserJet 5M/5Si
Printer Language	PCL6	PCL6	PCL5E	PCL5E	PCL6
HP PJL	Supported	Supported	Supported	Supported	Supported
Printer Resolution	300/600 dpi	300/600/1200 dpi	300 dpi	300/600 dpi	300/600 dpi
Standard Fonts (Resident Fonts)	80 Bitmap 45 Scalable 35 KPDL	1 Bitmap 80 Scalable 80 KPDL	79 Bitmap 45 Scalable	79 Bitmap 45 Scalable	80 Bitmap 45 Scalable 35 KPDL
Resource Saving	Supported	Supported	Supported	Supported	Supported

The factory default symbol set is Roman-8, consisting of US ASCII through character code 126 and Roman Extension characters and symbols for the higher character codes. To change this default symbol set, use the FRPO command with the U6 and U7 parameters. The default font is CourierBM12-Roman (font 1).

To set the printer to power up in LaserJet mode with the Dutch801BM10-Roman font (font 2) and Spanish character set, send the following Prescribe command:

```
!R! FRPO P1, 6; FRPO P3, 1; FRPO U6, 7;
    FRPO C5, 0; FRPO C2, 0; FRPO C3, 2;
EXIT;
```

To use a scalable font as the default font, Dutch801SWC-Roman of 14.25 points for example, replace the second line above with the following three lines.

```
FRPO V3, 'Dutch801SWC-Roman';
FRPO V1, 14;
FRPO V2, 25;
```

See *Chapter 5* for details of the FRPO V parameters.

The symbol set can be changed after power-up with the CSET or INTL command, or from the printer's control panel, or with LaserJet control codes typically accessed through software.

The Kyocera printer also supports as many HP symbol sets as the LaserJet regularly supports and still other symbol sets can be provided in downloaded fonts. (A full list of the supported symbol sets appear in section *LaserJet Symbol Sets* on page 6-47.) These symbol sets can be used by appropriate font selection commands as explained below.

Note: **The font and symbol set support is not identical between the models supporting LaserJet III, LaserJet 4 and LaserJet 4 Plus. For details also refer to Laser Jet Symbol Sets, page 6-47.**

Fonts can be selected with Prescribe 2e commands, or through the Kyocera FS-series printer driver provided with your software. The following font sample was created through driver support.

Word-Processing Features

In addition to *italics*, underlines, **horizontally** and **vertically** bolded type, etc., your LaserJet word-processing software can command all of the laser printer's fonts. Need French? *Appuyer simplement sur une touche pour sélectionner les caractères français* or German, UK, Danish/Norwegian, Swedish/Finnish, Italian, Spanish, Roman-8, or US Legal.

Proportional Spacing

If your word-processing software supports proportional spacing, 10-point Dutch 801 is an excellent font with extremely good italic.

Resident Italics

The reason for the high quality of the 10-point Dutch 801 is that they are a separate resident font. *Compare the generated italics of 8-point Dutch 801 (this line).*

Landscape Mode and Small Print

In landscape mode the printer has resident italics for several of the fixed-spacing fonts as well. This line is 6-point Swiss 721. Note the clarity and good character form, despite the small size.

Additional *soft* fonts can be downloaded from floppy disks before printing begins. The printer selects the fonts by a set of command codes (escape sequences) that describe the font attributes: character height, orientation, weight, character set, etc. (similar to the parameters used with the FSET command of Prescribe 2e). The page printer's resident fonts include the HP resident fonts and many of the fonts from the HP font cartridges.

The page printer supports the same soft fonts as the HP LaserJet printers. In addition, the page printer understands the LaserJet command codes and can use them to select any of its resident or downloaded fonts.

Since the LaserJet font selection codes are fairly complex (Refer to *LaserJet Font Selection* section.), software that supports the Laser Jet usually provides a simplified set of font selection commands which the software translates into LaserJet command codes.

Software-provided font selection commands will work for the laser printer as they would for the HP LaserJet series printers. If a requested font is not present in the page printer's memory, the page printer will choose from the characteristics of the closest matching font.

The bitmap font mode in the LaserJet series emulation is *13*, so the printer automatically adjusts the character spacing and page orientation for each selected font, but leaves your software in control of the line spacing. Note that changing the page orientation with an embedded command causes a page break. Use the **SPO** (Set Page Orientation) command to change orientation on the same page.

The LaserJet emulation supports 600/1200 dpi raster graphics for printer models with the 300/600/1200 dpi resolution support. There is also support of delta row compression and compressed raster data for run length encoding and TIFF.

The page printer supports the LaserJet vector graphics, which draw vertical or horizontal ruled lines and create rectangles filled with a pattern or gray scale.

The margins in this emulation differ from the *A* parameters of the FRPO command. They recognize the page size of the default cassette. If you attempt to print beyond the right margin, the characters will be discarded.

Cassette size	Line per page	Character per line
Letter	60	80
A4	64	77

(Assuming 6 lines per inch and 10 characters per inch)

Note: **The proportional spacing is not identical to the LaserJet's proportional spacing. Right-margin justification may not be correct when using the LaserJet printer driver (when a LaserJet driver is selected within the application software).**

LaserJet Fonts

The page printer emulates the LaserJet fonts as listed below.

Internal bitmap fonts (LaserJet III only)

LaserJet III/4 font	Pitch	Height	Style	Orien-tation	Kyocera printer font	Number	
					Name	Port.	Land.
Courier	10	12	Med.	P/L	CourierBM12-Roman	1	17
Courier	10	12	Bold	P/L	CourierBM12-Bold	38	67
Courier	10	12	Italic	Port.	CourierBM12-Italic	37	18
Courier	12	10	Med.	Port.	CourierBM10-Roman*	80	84
Courier	12	10	Bold	Port.	CourierBM10-Bold*	82	86
Courier	12	10	Italic	Port.	CourierBM10-Italic*	81	85
Lineprinter	16.67	8.5	Med.	P/L	LinePrinterBM9-Roman	15	34

* Available on the Kyocera printer as option fonts (FR-1)

Internal scalable fonts

HP LaserJet font	Kyocera printer font	Style
Courier*	CourierSWC	Medium, Italic, Bold, BoldItalic
CG Times	Dutch801SWC	Medium, Italic, Bold, BoldItalic
Letter Gothic*	LetterGothicSWC	Medium, Italic, Bold
CG Omega*	ZapfHumanist601SWC	Medium, Italic, Bold, BoldItalic
Coronet*	Ribbon131SWC	Medium
Clarendon Condensed*	Clarendon-Condensed SWC	Bold
ITC Zapf Dingbats**	ZapfDingbatsSWC	Medium
Universe	Swiss742SWC	Medium, Italic, Bold, BoldItalic, Medium Condensed, Italic Condensed, Bold Condensed, BoldItalic Condensed
Antique Olive*	Incised901SWC	Medium, Italic, Bold
Garamond*	OriginalGaramondSWC	Antiqua, Kurisiv, Halbfett, Kursiv Halbfett
Marigold*	AudreyTwoSWC	Medium
Albertus*	Flareserif821SWC	Medium, Extra Bold
Arial*	Swiss721SWM	Medium, Italic, Bold, BoldItalic
Symbol*	Symbol-Set-SWM	Medium
Times New Roman*	Dutch801SWM	Medium, Italic, Bold, BoldItalic
Wingdings*	MoreWingbatsSWM	Medium

In models in which Agfa fonts are installed, the font names are the same as those for HP LaserJet fonts.
* For models FS-600/1600/1700/3600/3700/6500/7000
** For models FS-400/1550/3400

CG Times is a product of Compugraphic Corporation. Univers is a trademark of Linotype AG or its subsidiaries.

LaserJet Font Selection

Printer Resolution

The FS-1750/3750 printers support dot resolutions of 300, 600 and 1200 dpi. The FS-600/1200/1600/1700/1700+/3600/3700/3700+/6700/7000/7000+/9000 printers support dot resolutions of 300 and 600 dpi. Because of this variation in resolution, they perform differently from the FS-400/1500/3400/6500 printers. These differences are discussed in the current section.

Font Selection

Resolution does not effect the availability of scalable fonts in 300 and 600 dpi resolutions. Bitmap fonts present one obvious limitation. If the printer uses a 300 dpi default resolution, 600 dpi bitmap fonts may not be used. Whether these 600 dpi bitmaps are LDFC fonts or downloaded bitmap fonts by the user, they will constantly print unpredictably if the printer uses a default resolution of 300 dpi.

Font Priority

On the printers with the 600/1200 dpi resolution support, font selection in the HP LaserJet format adds an additional step to the font prioritization format. In font selection, the page printer evaluates the characteristics of the font and, by a process of matching features, reduces selection to a single font. The highest priority characteristic is symbol set, followed by spacing, pitch, point size, font style, stroke weight, and typeface. The LaserJet emulation (mode 6) adds resolution to this priority list. This additional priority is not available in the printers not supporting the 600/1200 dpi resolutions.

For example, the FS-1700 (600 dpi) printer might face a font selection scenario of four near identical types of the Dutch801 font (by the KPDL emulation):

Dutch801BM10-Roman (one of the 79 bitmap fonts)
Dutch801SWC-Roman (LaserJet III compatible Intelli font)
Dutch801Roman-SWA (PostScript compatible font provided with PK-1/2)

Dutch801Roman-SWM (LaserJet 4/4 Plus compatible TrueType font)

These fonts have several common attributes and there is a possibility that selecting a scalable Dutch801 may insert the Dutch801BM bitmap font instead as a result of the internal font evaluation procedure. It is therefore important to understand how fonts are selected by the printer. (See *Chapter 3* for a discussion of the printer's internal font evaluation.)

The final (lowest) priority for font priority is the font source. The source refers to the place where the font is accessed. The following table shows how this characteristic is ordered.

Ordering priority	Source	Priority within same source
1	Downloadable and LDFC fonts	Smaller font ID
2	Memory card fonts	Top slot > Bottom slot
3	Resident and optional fonts	Alphabetic order

Users should note two differences in the source priority of font selection. Ordering priority 1 uses the original HP method whereby the internal number assigned to a font would be evaluated and the lowest number given the higher priority. This method applies to fonts downloaded to the printer, any LDFC fonts and the Kyocera resident bitmap fonts. Ordering priority 3 evaluates the font in alphabetic order. This method applies to the scalable resident and optional FS-series fonts and the KPDL fonts. An FRPO command (`FRPO C8;`) can modify this evaluation method by turning off evaluation of either the Kyocera bitmap fonts, or KPDL fonts or both. The Kyocera resident and optional (FR-1) scalable fonts are not affected by this FRPO command. These fonts were designed by Bitstream Corporation and observe the alphabetic ordering method used by Bitstream.

Scalable Fonts

The 600-dpi printer supports two new fixed space fonts: *Courier* and *Letter Gothic*. These fonts can be selected with the Prescribe font command or with escape sequences. To select a font with the latter, use a height parameter as specified in the following table.

Type Vendor	Spacing	Font Height
Intellifont	Proportional	ESC(s#V ESC)s#V
Intellifont	Fixed	ESC(s#H ESC)s#H
TrueType	Proportional	ESC(s#V ESC)s#V

LaserJet Font Escape Sequences

The example below shows an HP font selection escape sequence that selects a LetterGothic font with fixed-pitch, 12-cpi, 12-point, upright-style, normal stroke weight.

Characteristic	Value (example)	Escape Sequence
Symbol set	Roman	ESC(8U
Spacing	Fixed	ESC(s0P
Pitch	12-cpi	ESC(s12H
Height	12-point	ESC(s12V
Style	Upright	ESC(s0S
Stroke weight	Normal	ESC(s0B
Typeface	Letter Gothic	ESC(s6T

To select this LetterGothic font, send the following escape sequence to the printer:

```
ESC(8U ESC(s0P ESC(s12H ESC(s12V ESC(s0S ESC(s0B
ESC(s6T
```

Any escape sequence with two similar consecutive letters after the ESC parameter can be combined as in the transformation of the LetterGothic font below:

```
ESC(8U ESC(s0p12h12v0s0b6T
```

The **FSET** command of Prescribe 2e utilizes a similar font selection method. (The symbol set selection is made with the CSET command.) Note the similarities in the FSET command sequence below:

```
FSET 0p12h12v0s0b6T;
```

Several other LaserJet codes should be considered for font management.

Font number

*ESC*c#D*

This specifies a font identification number for use in subsequent font management codes.

#:

number of 0 through 32767

Font control

*ESC*c#F*

This command provides manipulation of soft fonts inside the printer.

#:

0 — Delete all soft fonts
1 — Delete all temporary soft fonts
2 — Delete soft font (last ID specified)
3 — Delete character code (last ID and character specified)
4 — Make soft font temporary (last ID specified)
5 — Make soft font permanent (last ID specified)

Font selection by font number

ESC(#X/ESC)#X

`ESC(#X` *designates soft font as primary font*
`ESC)#X` *designates soft font as secondary font*

This command selects a soft font by using its specified font number.

#:

Font number of 0 through 32767

Transparent print data

ESC&p#X

`ESC&p#X[`*transparent data*`]`

This code accesses all characters in a font including those defined as non-printable.

#:

Number of bytes of transparent print data

LaserJet Symbol Sets

The factory default symbol set is Roman-8 (8U) for the printer models using the LaserJet emulation. The LaserJet printer has many other symbol sets not directly accessed by the INTL command. Temporary selection of one of these symbol sets can be made with the **CSET** (Change symbol SET) command or from the printer's control panel. You can also assign one of these symbol sets to a particular font using the FSET (change current Font SETting) command. More information on these commands appear in Chapter 3.

By giving a particular value for the FRPO U6 and U7 parameters, you can set one of the HP symbol sets as the power-up symbol set. In general, symbol set value is:

(Escape sequence value field value × 32) + (Decimal value of escape sequence termination character – 64) [=(U7 – 50) × 100 + U6])

Symbol set has the highest priority in the HP font selection. However, this does not apply to the power-up symbol set which is specified by the FRPO U6 and U7 commands. For example, if you specify a bitmap font as the power-up font and assign it a symbol set available for a scalable font only, the printer selects the bitmap font as the default font and ignores the power-up symbol set definition assigned by the FRPO command.

Symbol sets for bitmap fonts

Symbol Set	HP Symbol Set ID (Value)	FRPO U6 Value	FRPO U7 Value
ISO 60 Norway	0D (4)	4	50
Roman Extension*	0E (5)	5	
ISO 25 French*	0F (6)	6	
HP German*	0G (7)	7	
ISO 15 Italian	0I (9)	9	
ISO 14 JIS ASCII*	0K (11)	11	
ECMA-94 Latin 1	0N (14)	14	
ISO 11 Swedish	0S (19)	19	
ISO 6 ASCII	0U (21)	21	
ISO 61 Norwegian*	1D (36)	36	
ISO 4 U.K.	1E (37)	37	
ISO 69 French	1F (38)	38	
ISO 21 German	1G (39)	39	
HP Spanish*	1S (51)	51	
US Legal	1U (53)	53	
ISO 57 Chinese*	2K (75)	75	
ISO 17 Spain	2S (83)	83	
ISO 2 International Reference Version*	2U (85)	85	
ISO 10 Swedish*	3S (115)	15	51
ISO 16 Portuguese*	4S (147)	47	
ISO 84 Portuguese*	5S (179)	79	
ISO 85 Spanish*	6S (211)	11	52
PC Set 1 IBM*	8Q (273)	73	
HP Roman-8	8U (277)	77	
PC Extension*	9Q (305)	5	53
IBM PC-8	10U (341)	41	
IBM PC-8 (D/N)	11U (373)	73	
IBM PC-8 (Multilingual)	12U (405)	5	54

* Available only with models FS-400/1550/3400 (each including type A).

Symbol sets for scalable fonts

The following symbol sets are available as the power-up symbol set if the power-up font (FRPO V3) is a scalable font.
Those symbol sets that are shaded are available only on models with Agfa fonts installed.

Symbol Set	HP Symbol Set ID (Value)	FRPO U6 Value	FRPO U7 Value
ISO 60 Norway	0D (4)	4	
ISO 61 Roman Extension*	0E (5)	5	
ISO 25 French*	0F (6)	6	
ISO 25 German*	0G (7)	7	
ISO 15 Italian	0I (9)	9	
ISO 14 JIS ASCII*	0K(11)	11	
ECMA-94 Latin 1	0N (14)	14	
ISO 11 Swedish	0S (19)	19	
ISO 6 ASCII	0U (21)	21	
ISO 61 Norwegian*	1D (36)	36	50
ISO 4 U. K.	1E (37)	37	
ISO 69 French	1F (38)	38	
ISO 21 German	1G (39)	39	
ISO 15 Spanish*	1S (51)	51	
Legal	1U (53)	53	
ISO 57 Chinese*	2K (75)	75	
ISO Latin 2***	2N (78)	78	
ISO 17 Spanish	2S (83)	83	
ISO 2 IRV*	2U (85)	85	
PC Cyrillic	3R (114)	14	
ISO 10 Swedish*	3S (115)	15	
ISO 16 Portuguese*	4S (147)	47	
PS Math**	5M (173)	73	51
ISO Latin 5***	5N (174)	74	
ISO 84 Portuguese*	5S (179)	79	
ISO Windows Latin 5***	5T (180)	80	

Symbol Set	HP Symbol Set ID (Value)	FRPO U6 Value	FRPO U7 Value
Microsoft Publishing**	6J (202)	2	52
Ventura Math**	6M (205)	5	
ISO8859/10 Latin 6	6N (206)	6	
ISO 85 Spanish*	6S (211)	11	
Desktop	7J (234)	34	
Greek-8	8G (263)	63	
Math-8**	8M (269)	69	
Turkish-8	8T (276)	76	
8U Roman-8	8U (277)	77	
Windows Latin 2***	9E (293)	93	
Windows 3.1 Latin/Greek	9G (295)	95	
PC-1004	9J (298)	98	
Ventura ITC Zapf Dingbats*	9L (300)	0	53
Windows 3.1 Latin/Cyrillic	9R (306)	6	
PC Turkish***	9T (308)	8	
Windows	9U(309)	9	
PC-851 Latin/Greek	10G (327)	27	
PS Text	10J (330)	30	
PS ITC Zapf Dingbats*	10L (332)	32	
ISO8859/5 Latin/Cyrillic	10N (334)	34	
PC-855 Cyrillic/Serbia	10R (338)	38	
PC-8	10U (341)	41	
PC-869 Latin/Greek	11G (359)	59	
PC-8 Danish/Norwegian	11U (373)	73	
PC-8 Latin/Greek	12G (391)	91	
Macintosh***	12J (394)	94	
ISO8859/7 Latin/Greek	12N (398)	98	
USSR-GOST	12R (402)	2	54
PC-850	12U (405)	5	
Ventura International	13J (426)	26	
ABICOMP Brazil/Portugal	13P (432)	32	
PC-8 Bulgarian	13R (434)	34	
Greek Alternate 437G	14G (455)	55	
Ventura US	14J (458)	58	
ABICOMP International	14P (464)	64	
PC Ukrainian	14R (466)	66	
Pi Font**	15U (501)	1	55
PC-857	16U (533)	33	
PC 852***	17U (565)	65	
PC-853 Turkish/Latin 3	18U (597)	97	

Symbol Set	HP Symbol Set ID (Value)	FRPO U6 Value	FRPO U7 Value
Windows 3.1 Baltic	19L (620)	20	56
Symbol (Symbol-Set-SWM font only)	19M (621)	21	
Windows Latin 1***	19U (629)	29	
PC-860 Portugal	20U (661)	61	
PC-861 Iceland	21U (693)	93	
PC-863 Canada-French	23U (757)	57	57
PC-8 Pollish Mazovia	24Q (785)	85	
PC-865 Norway	25U (821)	21	58
PC-775 Baltic	26U (853)	53	
PC-8 PC Nova	27Q (881)	81	
Windings (More Wingbats-RegularSWM font only)	579L (18540)	–	–

* Available only with models FS-400/FS-1550/FS-3400 (each including type A).

** Available only for the following fonts: AudreyTwo-RegularSWC, Clarendon-CondensedSWC, Courier-BoldSWC, Courier-BoldItalicSWC, Courier-ItalicSWC, Courier-SWC, Dutch801SWC-Bold, Dutch801SWC-BoldItalic, Dutch801SWC-Italic, Dutch801SWC-Roman, Flareserif821-ExtraBoldSWC, Flareserif821-RomanSWC, Incised901SWC-Black, Incised901SWC-Italic, Incised901SWC-Roman, LetterGothic-BoldSWC, LetterGothic-ItalicSWC, LetterGothic-SWC, OriginalGaramondSWC-Bold, OriginalGaramondSWC-BoldItalic, OriginalGaramondSWC-Italic, OriginalGaramondSWC-Roman, Ribbon131-RomanSWC, Swiss742SWC-Bold, Swiss742SWC-BoldCondensed, Swiss742SWC-BoldCondensedItalic, Swiss742SWC-BoldItalic, Swiss742SWC-Italic, Swiss742SWC-ItalicCondensed, Swiss742SWC-Roman, Swiss742SWC-RomanCondensed ZapfHumanist601SWC-Bold, ZapfHumanist601SWC-BoldItalic, ZapfHumanist601SWC-Demi, ZapfHumanist601SWC-DemiItalic,

*** Available with the 600-dpi models including FS-6500 (each including type A, if applicable).

Example:

To power up in the Dutch801SWC-Roman font for the Windows symbol set:

```
!R! FRPO V3, Dutch801SWC-Roman’;
    FRPO U6, 9; FRPO U7, 53;
    STAT;
EXIT;
```

The STAT command in the third line prints a status page that enables the user to confirm changes made with the preceding sequences.

Resource Protection

The resource protection feature is Kyocera's implementation of the HP's *resource saving*. The feature preserves resources used in the 600-dpi models during emulation switching. The protected resources, user-defined symbol sets and patterns, fonts, and macros, remain intact when the user switches to and from the HP LaserJet emulation.

A permanent default can be set for resource protection using the following FRPO command:

`!R! FRPO N9, 1; EXIT;` or `!R! FRPO N9, 2; EXIT;`

The MODE SELECT key on the printer's control panel may also be used to establish resource protection.

The following table summarizes the features and functions of the resource protection mode in the HP LaserJet emulation.

Resource (Property)	Emulation	N9 = 0	N9 = 1	N9 = 2
Soft fonts (Permanent)	HPLJ	Deleted	Retained	Retained
Soft fonts (Temporary)	HPLJ	Deleted	Deleted	Retained
Macros (Permanent)	HPLJ	Deleted	Retained	Retained
Macros (Temporary)	HPLJ	Deleted	Deleted	Retained
User patterns (Permanent)	HPLJ	Deleted	Retained	Retained
User patterns (Temporary)	HPLJ	Deleted	Deleted	Retained
User symbol set (Permanent)	HPLJ	Deleted	Retained	Retained
User symbol set (Temporary)	HPLJ	Deleted	Deleted	Retained
Print environment	HPLJ	Deleted	Deleted	Retained
Permanent dictionary	KPDL	Retained	Retained	Retained

A detailed description of the FRPO N9 command follows. Note that the factory default setting for the N9 command is 0.

- If N9 = 0
  No resources will be protected during emulation switching, regardless of whether they are temporary or permanent. When the user returns to the mode 6 emulation, the print environment will be reset. The print environment includes items such as number of copies, orientation, and margins.

- If N9 = 1
  The printer will store in memory all resources marked as permanent (soft fonts, macros, user patterns and symbol sets) and protect these resources during emulation switching. All resources marked as temporary (soft fonts, macros, user patterns, and symbol sets) will be lost during emulation switching. The print environment will be reset when it is returned to the mode 6 emulation.

- If N9 = 2
  The printer will store in memory all resources, both temporary and permanent, and protect them during emulation switching. Instead of resetting the mode 6 environment upon switching back, the printer will restore the previous print environment. This option demands a large share of printer memory.

Resource protection becomes operational under any of the following emulation switching conditions:

- An SEM command is sent to the printer.
- The emulation is changed by the user from the printer's front control panel.
- An Automatic Emulation Sensing (AES) function is used for switching between KPDL and PCL. Note that the optional KPDL function must be installed in the printer for this function to take effect.
- An HP LaserJet 5Si PJL command `@PJL ENTER LANGUAGE = ??` is used.

The KPDL permanent dictionary is always protected, regardless of the values for resource protection.

The amount of memory saved under resource protection is limited by the user memory available. Resource protection requires extra memory for storing downloaded fonts and macros. This memory requirement extends beyond the standard memory that accompanies the printer. The requirement varies based upon optional features installed in the printer.

Note that a print environment using resource protection but whose space has been limited by user memory items like macros, symbol sets and fonts, will render the resource protection feature non-operational.

The property value (temporary or permanent) assigned to a resource must be given in the PCL command language.
Prescribe provides no commands for making a temporary or permanent designation. As a result, resource protection mode applies only to those resources generated with the HP PCL command language. A description of the memory requirements and property values appear in the following table.

Table: Minimum memory requirement for Resource Protection

FS-1600/3600

Printing Condition	Resolution	
	300 dpi	600 dpi
HPLJ 4	2 Mbytes	2 Mbytes
HPLJ 4, duplex mode=None, raster memory=A4/Letter	2 Mbytes	6 Mbytes
HPLJ 4, duplex mode=None, raster memory=Legal	2 Mbytes	7 Mbytes
HPLJ 4, duplex mode=on, raster memory=A4/Letter	3 Mbytes	10 Mbytes
HPLJ 4, duplex mode=on, raster memory=Legal	3 Mbytes	11 Mbytes
HPLJ 4/KPDL, duplex mode=None, raster memory=A4/Letter	2 Mbytes	6 Mbytes
HPLJ 4/KPDL, duplex mode=None, raster memory=Legal	2 Mbytes	7 Mbytes
HPLJ 4/KPDL, duplex mode=on, raster memory=A4/Letter	3 Mbytes	10 Mbytes
HPLJ 4/KPDL, duplex mode=on, raster memory=Legal	3 Mbytes	11 Mbytes
HPLJ 4/KPDL, resource protection, duplex mode=None	10 Mbytes	10 Mbytes
HPLJ 4/KPDL, resource protection, duplex mode=on	14 Mbytes	14 Mbytes

FS-1700/3700

Printing Condition	Resolution	
	300 dpi	600 dpi
HPLJ 4 Plus only	2 Mbytes	2 Mbytes
HPLJ 4 Plus, duplex mode=on	2 Mbytes	3 Mbytes
HPLJ 4 Plus/KPDL, duplex mode=None	2 Mbytes	3 Mbytes
HPLJ 4 Plus/KPDL, duplex mode=on	3 Mbytes	4 Mbytes
HPLJ 4 Plus/KPDL, resource protection, duplex mode=None	—	10 Mbytes
HPLJ 4 Plus/KPDL, resource protection, duplex mode=on	—	14 Mbytes

FS-1200/7000/7000+/9000

Printing Condition	Resolution	
	300 dpi	600 dpi
HPLJ only	4 Mbytes	4 Mbytes
HPLJ, duplex mode=on	4 Mbytes	6 Mbytes (5 Mbytes [FS-1200])
HPLJ KPDL, duplex mode=None	4 Mbytes	6 Mbytes
HPLJ KPDL, duplex mode=on	4 Mbytes	8 Mbytes (5 Mbytes [FS-1200])
HPLJ KPDL, resource protection, duplex mode=None	—	10 Mbytes
HPLJ KPDL, resource protection, duplex mode=on	—	14 Mbytes

FS-1750/3750

Printing Condition	Resolution			
	300 dpi	600 dpi	1200 dpi	
			Fast mode	Fine mode
PCL 6, duplex mode=None	8 MB	8 MB	8 MB	8 MB
PCL 6, duplex mode=On	8 MB	8 MB	8 MB	12 MB
KPDL, duplex mode=None	8 MB	8 MB	8 MB	8 MB
KPDL, duplex mode=On	8 MB	8 MB	12 MB	12 MB
PCL 6/KPDL resource protection, duplex mode=None	—	10 MB	10 MB	10 MB
PCL 6/KPDL, resource protection, duplex mode=On	—	14 MB	14 MB	14 MB

Switching the Print Resolution

Because the printers with the 600/1200 dpi resolution support print at 300, 600, 1200 dpi, Kyocera provides an FRPO command to establish a default at either level.

For 600 dpi resolution, command:
`!R! FRPO N8, 1; EXIT;`

For 300 dpi resolution, command:
`!R! FRPO N8, 0; EXIT;`

When the printing resolution is changed between 1200 dpi, 600 dpi, and 300 dpi, the printer loads the PJL current environment values.

In addition to the FRPO N8 command as explained above, printers that permit the resolution to be set at either 300, 600, or 1200 are provided with the Prescribe RESL (change RESoLution) command which switches the resolution on the fly. For details about this command, refer to *Chapter 2*.

Note: **The amount of available printer memory will determine whether the 600/1200 dpi default can be effective. If factors such as resource protection, duplexing, and raster memory reduce memory too low, then the printer will remain at 300 dpi resolution.**

HP LaserJet Reset State

The printer resets to the following states when it receives a PCL reset command.

Job control	Number of copies	1
Page control	Cassette	Upper (R4)
	Orientation	Portrait (C1)
	Paper size	Installed tray size (R2)
	VMI	6 lpi (U0/U1)
	HMI	10 cpi (Spacing of font C5/2/3)
	Top margin	
	Text length	Paper size – (1/2-inch top + 1/2-inch bottom)
	Left margin	Left logical
	Right margin	Right logical
	Perforation skip	On
	Line termination	CR=CR, LF=LF, FF=FF
Fonts	Font number	Font 1 (C5/2/3)
	Symbol set	Roman-8 (U6/U7)
	Underline mode	Off
Font management	Font id	0
	Character code	0
Raster graphics	Raster graphics resolution	75
Rectangular area fill	Horizontal rectangle size	0
	Vertical rectangle size	0
	Area fill id	0
Macro	Macro id	0
Troubleshooting command	End of line wrap	Off
	Display functions	Off
Shown in parentheses are the related FRPO parameters.		

LaserJet PJL

The HP LaserJet emulation loads a Printer Job Language (PJL) that controls communication between the printer and the system. The PJL works for both KPDL and HP LaserJet emulations. It enables the user to change some default states but, more importantly, allows current printer states to be communicated back to the host system.

Note: **The Kyocera printers (with the 600/1200-dpi resolution support) support only a subset of the HP PJL commands. To check supported PJL features, see the table that follows.**

Supported PJL Commands

Command Group	Command	Description
Kernel Commands	Universal Exit Language (UEL)	Exits current printer language and returns control to PJL. Reset the PJL parser to start at the beginning of the line.
	COMMENT	Tells PJL to accept the command line as a comment.
	ENTER	Chooses a printer language for processing the current job.
Job Separation Commands	JOB	Informs printer of the start of a print job, resets the page count, allows naming of the job, supports non-printing mode for printing portions of jobs.
	EOJ	Instructs printer that the print job is complete, resets the page count.
Environment Commands	DEFAULT	Sets default for environment variables.
	SET	Sets an environment variable to a specified value during a PJL job.
	INITIALIZE	Resets current and default PJL variables to factory default.
	RESET	Defaults current PJL variables.

Command Group	Command	Description
Status Readback Commands	INQUIRE	Requires the current value for a specified environment variable.
	DINQUIRE	Requires the default value for a specified environment variable.
	ECHO	Returns the <*words*> portion of the command to the host computer.
	INFO	Requests a specified category of printer information, such as printer model, available printer memory, configuration, status, environment variables, and unsolicited status variables.
	USTATUS	Allows printer to send unsolicited status messages for device status changes, end-of-job status, and the number of pages printed. Status can be sent at specified time intervals.
	USTATUSOFF	Deactivates all unsolicited status.
Device Attendance Commands	RDYMSG	Specifies a message that replaces the Processing message on the message display. Shown in offline state if the printer is processing data (except in MODE SELECTing).
	OPMSG	Displays specified message on the message display and sets printer offline.
	STMSG	Displays specified message on the message display and sets printer offline. If status readback is on, returns name of the key that is used to return the printer online.

PJL command syntax

A PJL command line containing the ENTER command appears as follows:

The table below lists the control codes and special identifiers.

<HT>	Horizontal tab character (ASCII 9)
<LF>	Line feed character (ASCII 10)
<CR>	Carriage return character (ASCII 13)
<SP>	Space character (ASCII 32)
<ESC>	Escape character (ASCII 27)
<FF>	Form feed character (ASCII 12)
<WS>	White space, a result of one of more <SP> or <HT>.
<words>	Printable characters (ASCII characters 33 through 255) and <WS>, starting with a printable character.
^D	KPDL end-of-file indication. It is not part of PJL, but is used to end KPDL instructions.

The PJL command syntax should follow one of four formats:

Format 1

```
<ESC>%-12345X
```

This format uses the Universal Exit Language (UEL) only.

Format 2

```
@PJL [<CR>]<LF>
```

This format may be used to add a visual line break among the PJL command lines.

Format 3

```
@PJL command [<words>] [<CR>] <LF>
```

This format is currently used for the COMMENT and ECHO commands only. Examples:

```
@PJL COMMENT ... <LF>
@PJL ECHO ... <LF>
```

Format 4

```
@PJL command [command modifier : value] [option
name [= value]] [<CR>] <LF>
```

This format is used comprehensively for all of the other PJL commands.

```
@PJL DEFAULT LPARM : PCL PTSIZE=14.25<LF>
```

Rules for PJL Command Syntax

This section provides the rules that should be observed in using PJL commands:

The prefix "@PJL" always must be uppercase. Other parts of the PJL command are not case-sensitive.

Spacing between characters (white space) should either be the space character (ASCII 32) or the horizontal tab character (ASCII 9).

The placement of white space in PJL commands depends on its location within the command. Some white space is mandatory and some is optional:

- White space is required between the @PJL prefix and the PJL command name, and between the PJL command name and command modifiers.

  For example:
  `@PJL OPMSG DISPLAY` or
  `@PJL ENTER LANGUAGE = personality`

- If white space does not appear in any other place in the command, white space is optional.

- If white space appears between two portions of a PJL command, it is not allowed. An example of white space use appears between the optional carriage return and required line feed character that terminate most commands.

PJL variables

PJL uses alphanumeric variables, numeric variables, and strings. The following explains the three types of variables and their ranges.

Alphanumeric variables

Any combination of letters and digits, with the rule that the first character must always be a letter. Letters can consist of the uppercase letters (ASCII 65 through 90) and lowercase letters (ASCII 97 through 122). Digits can consist of numbers 0 through 9 (ASCII 48 through 57).

Example of valid alphanumeric variables:

```
Alpha 635
X2000
```

Examples of invalid alphanumeric variables:

`635Alpha`

(Alphanumeric variables must begin with a letter)

`X 2000`

(Space characters [ASCII 32] are not allowed in alphanumeric variables)

Numeric variables

Any number consisting of digits, with one optional decimal point and an optional plus (+) or minus (–) sign preceding the first digit. Only one decimal point may be used. It must also be placed somewhere after the first digit. Digits are unnecessary after the decimal point.

Examples of valid numeric variables:

```
0.123456
–123.456
+657000
2468.
```

Examples of invalid numeric variables:

`.123456`

(The decimal point must be preceded by at least 1 digit).

`–123.45.6`

(Only 1 decimal point is allowed in a numeric variable).

`+657,000`

(Commas should not be used in numeric variables).

Strings

Strings should be enclosed in quotation marks, and consist of any combination of characters of ASCII codes from 32 through 255 including 9 (horizontal tab) but excluding 34 (quotation marks). Examples are as follows.

Examples of valid strings:

`"Model:<HT>FS-1600/A"` — Tabs are allowed in a string.

`"The Arlington Ball Park"`

Examples of invalid strings:

`"It is 3.5" long."` — A string should not contain quotation marks.

`"Telephone number<CR>01234-5678"`

— <CR> is out of the valid range of ASCII characters for a string.

Invalid Commands

Invalid commands are in two general types: those with syntax errors and those with syntax or semantic warnings. The printer handles each of those types different ways.

Syntax errors contain errors such as unrecognized commands and command modifiers, strings with missing closing double quotations, numeric values with missing digits before the decimal points, and numeric values encountered when alphanumeric values are to be expected. The printer ignores the entire PJL commands when it receives commands having syntax errors. Some examples follow.

The JOB command's NAME option requires double quotations around its value part.

Valid command:

```
@PJL JOB NAME = "Job Number 50" <LF>
```

Invalid command:

```
@PJL JOB NAME = "Job Number 51 <LF>
```

— The closing quotation is required

Syntax warnings and semantic warnings are issued for such commands that have unsupported options, values out of range, values missing or of the incorrect type, or values added when none are allowed. When the printer receives commands with syntax or semantic warnings, the part of the command including the warning is ignored.

In the following example, the START option is valid for the JOB command.

Valid command:
```
@PJL JOB START = 1 <LF>
```

While in the following, FINISH is not a valid option and ignored (END should be used).

Invalid command:
```
@PJL JOB START = 1 FINISH = HOME <LF>
```

Reset Status

The following table shows the FRPO or PJL commands that initializes the environments for the different categories of printer models.

Environment	**FS-400/A** **FS-1550/A** **FS-3400/A**	**FS-600** **FS-1600/A** **FS-3600/A** **FS-6500**	**FS-1700** **FS-3700** **FS-7000** **FS-7000+**	**FS-9000+** **FS-1750** **FS-3750**
	FRPO parameter	**PJL command**		
Printing resolution	—	RESOLUTION		
Raster memory (HP Page protection)	FRPO R5	PAGEPROTECT		
Personality	—	PERSONALITY		
KIR (HP RET)	FRPO N0	RET		
Interface timeout	FRPO N9	TIMEOUT		
Copy	FRPO C0	COPIES		
Paper size	FRPO R2	PAPER		
Orientation	FRPO C1	ORIENTATION		
Manual feed	FRPO R4	MANUAL FEED		
Paper source	FRPO R4	MANUAL FEED		
Output stack	FRPO R0	OUTBIN		
Duplex	FRPO N4	DUPLEX		
Default font number	FRPO C5/2/3 or V3	FONTNUMBER		
Point size	FRPO V0-2	PTSIZE		
Pitch	—	PITCH		
Symbol set	FRPO U6/U7	SYMSET		

HP LaserJet Printer Commands — PCL

Function	Parameter	Command	Hexadecimal Value	(A)	(B)	(C)	(D)
JOB CONTROL COMMANDS							
Reset							
Reset		$^{E}s_{C}E$	1B 45	Yes	Yes	Yes	Yes
Number of Copies	# of Copies (1-999)	$^{E}s_{C}\&\ell\#X$	1B 26 6C #...# 58	Yes	Yes	Yes	Yes
Long-Edge (Left) Offset	# of Decipoints (1/720")	$^{E}s_{C}\&\ell\#U$	1B 26 6C #...# 55	Yes	Yes	Yes	Yes
Short-Edge (Top) Offset	# of Decipoints (1/720")	$^{E}s_{C}\&\ell\#Z$	1B 26 6C #...# 5A	Yes	Yes	Yes	Yes
Unit of Measure	# = Number of units per inch	$^{E}s_{C}\&u\#D$	1B 26 75 #...# 44	No	Yes	Yes	Yes
Exit PCL Language	—	$^{E}s_{C}\%-12345X$	1B 25 2D 31 32 33 34 35 58	Yes	Yes	Yes	Yes
Simplex/Duplex Operation							
Simplex/Duplex Print	Simplex	$^{E}s_{C}\&\ell 0S$	1B 26 6C 30 53	Yes*	Yes	–	Yes
	Duplex Long-Edge-Binding	$^{E}s_{C}\&\ell 1S$	1B 26 6C 31 53	Yes*	Yes	No	Yes
	Short-Edge-Binding	$^{E}s_{C}\&\ell 2S$	1B 26 6C 32 53	Yes*	Yes	No	Yes
Page Side Selection	Next Side	$^{E}s_{C}\&a0G$	1B 26 61 30 47	Yes	Yes	No	Yes
	Front Side	$^{E}s_{C}\&a1G$	1B 26 61 31 47	Yes	Yes	No	Yes
	Back Side	$^{E}s_{C}\&a2G$	1B 26 61 32 47	Yes	Yes	No	Yes
Job Separation	—	$^{E}s_{C}\&\ell 1T$	1B 26 6C 31 54	No	No	No	Yes

* Unsupported by FS-400/A.

(A): FS-400/FS-1550/FS-3400
(B): FS-600/FS-680/FS-800/FS-1200/FS-1600/FS-1700/FS-1700+/FS-1750/FS-3700/FS-3700+/FS-3750
(C): FS-6500/FS-6700
(D): FS-7000/FS-7000+/FS-9000

Function	Parameter	Command	Hexadecimal Value	(A)	(B)	(C)	(D)
		PAGE CONTROL COMMANDS					
		Page Length and Size					
Paper Source	Eject Page	$^{E}s_{C}\&\ell 0H$	1B 26 6C 30 48	Yes	Yes	Yes	Yes
	Upper Paper Tray	$^{E}s_{C}\&\ell 1H$	1B 26 6C 31 48	Yes	Yes	Yes	Yes
	Manual Feed	$^{E}s_{C}\&\ell 2H$	1B 26 6C 32 48	Yes	Yes	Yes	Yes
	Manual Envelope Feed	$^{E}s_{C}\&\ell 3H$	1B 26 6C 33 48	Yes	Yes	Yes	Yes
	Lower Tray	$^{E}s_{C}\&\ell 4H$	1B 26 6C 34 48	Yes	Yes	Yes	Yes
	Optional Large Paper Source	$^{E}s_{C}\&\ell 5H$	1B 26 6C 35 48	No	No	No	Yes
	Envelope Feeder	$^{E}s_{C}\&\ell 6H$	1B 26 6C 36 48	Yes	Yes	Yes	Yes
	Auto Select	$^{E}s_{C}\&\ell 7H$	1B 26 6C 37 48	No	No	No	No
	Tray 1 (right tray)	$^{E}s_{C}\&\ell 8H$	1B 26 6C 38 48	No	No	No	No
	Optional Source #2	$^{E}s_{C}\&\ell 20H$	32 30	No	No	No	Yes
	Optional Source #3	$^{E}s_{C}\&\ell 21H$	32 31	No	No	No	Yes
	Optional Source #4	$^{E}s_{C}\&\ell 22H$	32 32	No	No	No	Yes
Output Bin	Upper bin	$^{E}s_{C}\&\ell 1G$	1B 25 6C 31 47	Yes	Yes	Yes	Yes
	Rear (lower) bin	$^{E}s_{C}\&\ell 2G$	1B 25 6C 32 47	Yes	Yes	Yes	Yes
	Stacker Face Up*1	$^{E}s_{C}\&\ell 2G$	1B 26 6C 32 47	No	No	No	Yes
	Stacker Face Down*1	$^{E}s_{C}\&\ell 3G$	1B 26 6C 33 47	No	No	No	Yes
	Sorter Tray 1 (Face Down)*2	$^{E}s_{C}\&\ell 4G$	1B 26 6C 34 47	No	No	No	Yes
	Sorter Tray 2 (Face Down)*2	$^{E}s_{C}\&\ell 5G$	1B 26 6C 35 47	No	No	No	Yes
	Sorter Tray 3 (Face Down)*2	$^{E}s_{C}\&\ell 6G$	1B 26 6C 36 47	No	No	No	Yes
	Sorter Tray 4 (Face Down)*2	$^{E}s_{C}\&\ell 7G$	1B 26 6C 37 47	No	No	No	Yes
	Sorter Tray 5 (Face Down)*2	$^{E}s_{C}\&\ell 8G$	1B 26 6C 38 47	No	No	No	Yes
	Sorter Tray 6 (Face Down)*2	$^{E}s_{C}\&\ell 9G$	1B 26 6C 39 47	No	No	No	Yes
	Sorter Tray 7 (Face Down)*2	$^{E}s_{C}\&\ell 10G$	1B 26 6C 31 30 47	No	No	No	Yes
	Sorter Tray 8 (Face Down)*2	$^{E}s_{C}\&\ell 11G$	1B 26 6C 31 31 47	No	No	No	Yes
	Sorter Tray 9 (Face Down)*2	$^{E}s_{C}\&\ell 12G$	1B 26 6C 31 32 47	No	No	No	Yes

*1: Valid only when the optional Bulk Stacker (ST-30) or the optional Document Finisher (DF-30/DF-31) is installed.
*2: Valid only when the optional Sorter (SO-30) is installed.

(A): FS-400/FS-1550/FS-3400
(B): FS-600/FS-680/FS-800/FS-1200/FS-1600/FS-1700/FS-1700+/FS-1750/FS-3700/FS-3700+/FS-3750
(C): FS-6500/FS-6700
(D): FS-7000/FS-7000+/FS-9000

Function	Parameter	Command	FS 400, 600, 680, 800, 1700/+, 1750, 3700/+, 5800C, 6700, 7000	FS 1000, 1200, 1750, 1800, 3750, 3800, 5900C, 6300, 6900, 7000+, 9000	MICR: FS 1714M, 3718M, 7028M
		Media Type			
Media Type	Automatic[a]	Esc&n5WdAuto	No	Yes	Yes
	Plain	Esc&n6WdPlain	No	Yes	Yes
	Transparency	Esc&n13WdTransparency	No	Yes	Yes
	Preprinted	Esc&n11WdPreprinted	No	Yes	Yes
	Labels	Esc&n7WdLabels	No	Yes	Yes
	Bond	Esc&n5WdBond	No	Yes	Yes
	Recycled	Esc&n9WdRecycled	No	Yes	Yes
	Vellum	Esc&n7WdVellum	No	Yes	Yes
	Rough	Esc&n6WdRough	No	Yes	Yes
	Letterhead	Esc&n11WLetterhead	No	Yes	Yes
	Color	Esc&n6WdColor	No	Yes	Yes
	Prepunched	Esc&n11WPrepunched	No	Yes	Yes
	Envelope	Esc&n9WdEnvelope	No	Yes	Yes
	Card stock	Esc&n11WdCard Stock	No	Yes	Yes
	Custom 1	Esc&n8WdCustom1	No	Yes	Yes
	Custom 2	Esc&n8WdCustom2	No	Yes	Yes
	Custom 3	Esc&n8WdCustom3	No	Yes	Yes
	Custom 4	Esc&n8WdCustom4	No	Yes	Yes
	Custom 5	Esc&n8WdCustom5	No	Yes	Yes
	Custom 6	Esc&n8WdCustom6	No	Yes	Yes
	Custom 7	Esc&n8WdCustom7	No	Yes	Yes
	Custom 8	Esc&n8WdCustom8	No	Yes	Yes

a. Not supported by HP PCL

Function	Parameter	Command	Hexadecimal Value	(A)	(B)	(C)	(D)
		Page Length and Size					
Page Size	Executive	$^{E}S_{C}$&ℓ1A	1B 26 6C 31 41	Yes	Yes	Yes	Yes
	Letter	$^{E}S_{C}$&ℓ2A	1B 26 6C 32 41	Yes	Yes	Yes	Yes
	Legal	$^{E}S_{C}$&ℓ3A	1B 26 6C 33 41	Yes	Yes	Yes	Yes
	Ledger	$^{E}S_{C}$&ℓ6A	1B 26 6C 36 41	No	No	Yes	Yes
	A4	$^{E}S_{C}$&ℓ26A	1B 26 6C 32 36 41	Yes	Yes	Yes	Yes
	A3	$^{E}S_{C}$&ℓ27A	1B 26 6C 32 37 41	No	No	Yes	Yes
	JIS B5 Paper	$^{E}S_{C}$&ℓ45A	1B 26 6C 34 35 41	No	No	No	Yes
	JIS B4 Paper	$^{E}S_{C}$&ℓ46A	1B 26 6C 34 36 41	No	No	No	Yes
	Hagaki Postcard	$^{E}S_{C}$&ℓ71A	1B 26 6C 37 31 41	No	No	No	Yes
	Oufuku-Hagaki	$^{E}S_{C}$&ℓ72A	1B 26 6C 37 32 41	No	No	No	Yes
	International B5	$^{E}S_{C}$&ℓ100A	1B 26 6C 31 30 30 41	No	Yes	Yes	Yes
	Custom	$^{E}S_{C}$&ℓ101A	1B 26 6C 31 30 31 41	No	No	No	Yes
	Monarch	$^{E}S_{C}$&ℓ80A	1B 26 6C 38 30 41	Yes	Yes	Yes	Yes
	COM 10	$^{E}S_{C}$&ℓ81A	1B 26 6C 38 31 41	Yes	Yes	Yes	Yes
	DL	$^{E}S_{C}$&ℓ90A	1B 26 6C 39 30 41	Yes	Yes	Yes	Yes
	C5	$^{E}S_{C}$&ℓ91A	1B 26 6C 39 31 41	Yes	Yes	Yes	Yes
Page Length	# of Lines	$^{E}S_{C}$&ℓ#P	1B 26 6C #...# 050	Yes	Yes	Yes	Yes
		Orientation					
Orientation	Portrait	$^{E}S_{C}$&ℓ0O	1B 26 6C 30 4F	Yes	Yes	Yes	Yes
	Landscape	$^{E}S_{C}$&ℓ1O	1B 26 6C 31 4F	Yes	Yes	Yes	Yes
	Reverse Portrait	$^{E}S_{C}$&ℓ2O	1B 26 6C 32 4F	Yes	Yes	Yes	Yes
	Reverse Land-scape	$^{E}S_{C}$&ℓ3O	1B 26 6C 33 4F	Yes	Yes	Yes	Yes
Print Direction	# Degrees of Rotation (counterclockwise 90°increments only)	$^{E}S_{C}$&a#P	1B 26 61 #...# 50	Yes	Yes	Yes	Yes
Character Text Path	Horizontal	$^{E}S_{C}$&c0T	1B 26 63 30 54	No	No	No	Yes
Direction	Vertical Rotated	$^{E}S_{C}$&c-1T	1B 26 63 2D 31 54	No	No	No	Yes
		Margins and Text Length					
Top Margin	# of Lines	$^{E}S_{C}$&ℓ#E	1B 26 6C #...# 45	Yes	Yes	Yes	Yes
Text Length	# of Lines	$^{E}S_{C}$&ℓ#F	1B 26 6C #...# 46	Yes	Yes	Yes	Yes
Left Margin	# of Columns	$^{E}S_{C}$&a#L	1B 26 61 #...# 4C	Yes	Yes	Yes	Yes
Right Margin	# of Columns	$^{E}S_{C}$&a#M	1B 26 61 #...# 4D	Yes	Yes	Yes	Yes
Clear Horizontal Margins		$^{E}S_{C}$9	1B 39	Yes	Yes	Yes	Yes
		Perforation Skip Mode					
Perforation Skip	Disable	$^{E}S_{C}$&ℓ0L	1B 26 6C 30 4C	Yes	Yes	Yes	Yes
	Enable	$^{E}S_{C}$&ℓ1L	1B 26 6C 31 4C	Yes	Yes	Yes	Yes

(A): FS-400/FS-1550/FS-3400
(B): FS-600/FS-680/FS-800/FS-1200/FS-1600/FS-1700/FS-1700+/FS-1750/FS-3700/FS-3700+/FS-3750
(C): FS-6500/FS-6700
(D): FS-7000/FS-7000+/FS-9000

Function	Parameter	Command	Hexadecimal Value	(A)	(B)	(C)	(D)
		Horizontal Column Spacing					
Horizontal Motion Index (HMI)	# of 1/120" Increments	$^{E}s_{C}$&ℓk#H	1B 26 6B #...# 48	Yes	Yes	Yes	Yes
		Vertical Line Spacing					
Vertical Motion Index (VMI)	# of 1/48" Increments	$^{E}s_{C}$&ℓ#C	1B 26 6C #...# 43	Yes	Yes	Yes	Yes
Line Spacing (Lines per inch)	1 line/inch	$^{E}s_{C}$&ℓ1D	1B 26 6C 31 44	Yes	Yes	Yes	Yes
	2 lines/inch	$^{E}s_{C}$&ℓ2D	1B 26 6C 32 44	Yes	Yes	Yes	Yes
	3 lines/inch	$^{E}s_{C}$&ℓ3D	1B 26 6C 33 44	Yes	Yes	Yes	Yes
	4 lines/inch	$^{E}s_{C}$&ℓ4D	1B 26 6C 34 44	Yes	Yes	Yes	Yes
	6 lines/inch	$^{E}s_{C}$&ℓ6D	1B 26 6C 36 44	Yes	Yes	Yes	Yes
	8 lines/inch	$^{E}s_{C}$&ℓ8D	1B 26 6C 38 44	Yes	Yes	Yes	Yes
	12 lines/inch	$^{E}s_{C}$&ℓ12D	1B 26 6C 31 32 44	Yes	Yes	Yes	Yes
	16 lines/inch	$^{E}s_{C}$&ℓ16D	1B 26 6C 31 36 44	Yes	Yes	Yes	Yes
	24 lines/inch	$^{E}s_{C}$&ℓ24D	1B 26 6C 32 34 44	Yes	Yes	Yes	Yes
	48 lines/inch	$^{E}s_{C}$&ℓ48D	1B 26 6C 34 38 44	Yes	Yes	Yes	Yes
Alphanumeric ID	# of bytes	$^{E}s_{C}$&n#W [operation] [String]	1B 26 6E #...# 57	No	No	No	Yes
		CURSOR POSITIONING					
		Vertical and Horizontal					
Vertical Position	# of Rows	$^{E}s_{C}$&a#R	1B 26 61 #...# 52	Yes	Yes	Yes	Yes
	# of Dots	$^{E}s_{C}$*p#Y	1B 2A 70 #...# 59	Yes	Yes	Yes	Yes
	# of Decipoints	$^{E}s_{C}$&a#V	1B 26 61 #...# 56	Yes	Yes	Yes	Yes
Horizontal Position	# of Columns	$^{E}s_{C}$&a#C	1B 26 61 #...# 43	Yes	Yes	Yes	Yes
	# of Dots	$^{E}s_{C}$*p#X	1B 2A 70 #...# 58	Yes	Yes	Yes	Yes
	# of Decipoints	$^{E}s_{C}$&a#H	1B 26 61 #...# 48	Yes	Yes	Yes	Yes
Half Line Feed		$^{E}s_{C}$=	1B 3D	Yes	Yes	Yes	Yes
		End-of-Line Termination					
Line Termination	CR = CR; LF = LF; FF = FF	$^{E}s_{C}$&k0G	1B 26 6B 30 47	Yes	Yes	Yes	Yes
	CR = CR + LF LF = LF; FF = FF	$^{E}s_{C}$&k1G	1B 26 6B 31 47	Yes	Yes	Yes	Yes
	CR = CR; LF = CR + LF; FF = CR + FF	$^{E}s_{C}$&k2G	1B 26 6B 32 47	Yes	Yes	Yes	Yes
	CR = CR + LF; LF = CR + LF; FF = CR + FF	$^{E}s_{C}$&k3G	1B 26 6B 33 47	Yes	Yes	Yes	Yes

(A): FS-400/FS-1550/FS-3400
(B): FS-600/FS-680/FS-800/FS-1200/FS-1600/FS-1700/FS-1700+/FS-1750/FS-3700/FS-3700+/FS-3750
(C): FS-6500/FS-6700
(D): FS-7000/FS-7000+/FS-9000

Function	Parameter	Command	Hexadecimal Value	(A)	(B)	(C)	(D)
		Push/Pop Position					
Push/Pop Position	Push	$^{E}s_{C}$&f0S	1B 26 66 30 53	Yes	Yes	Yes	Yes
	Pop	$^{E}s_{C}$&f1S	1B 26 66 31 53	Yes	Yes	Yes	Yes
		FONT SELECTION					
		Symbol Set Selection					
Primary Symbol Set	ISO 60: Norwegian	$^{E}s_{C}$(0D	1B 28 30 44	Yes	Yes	Yes	Yes
	ISO 4: United Kingdom	$^{E}s_{C}$(1E	1B 28 31 45	No	Yes	Yes	Yes
	Windows 3.1 Latin 2	$^{E}s_{C}$(9E	1B 28 39 45	Yes	Yes	Yes	Yes
	ISO 69: French	$^{E}s_{C}$(1F	1B 28 31 46	Yes	Yes	Yes	Yes
	ISO 21: German	$^{E}s_{C}$(1G	1B 28 31 47	Yes	Yes	Yes	Yes
	ISO 15: Italian	$^{E}s_{C}$(0l	1B 28 30 49	Yes	Yes	Yes	Yes
	Microsoft Publishing	$^{E}s_{C}$(6J	1B 28 36 4A	Yes	Yes	Yes	Yes
	DeskTop	$^{E}s_{C}$(7J	1B 28 37 4A	Yes	Yes	Yes	Yes
	PS Text	$^{E}s_{C}$(10J	1B 28 31 30 4A	Yes	Yes	Yes	Yes
	MC Text	$^{E}s_{C}$(12J	1B 28 31 32 4A	Yes	Yes	Yes	Yes
	Ventura International	$^{E}s_{C}$(13J	1B 28 31 33 4A	Yes	Yes	Yes	Yes
	Ventura US	$^{E}s_{C}$(14J	1B 28 31 34 4A	Yes	Yes	Yes	Yes
	Wingdings	$^{E}s_{C}$(579L	1B 28 35 37 39 4C	No	Yes	Yes	Yes
	Ventura ITC Zapf Dingbats	$^{E}s_{C}$(9L	1B 28 39 4C	Yes	No	No	Yes
	PS ITC Zapf Dingbats	$^{E}s_{C}$(10L	1B 28 31 30 4C	Yes	No	No	Yes
	ITC Zapf Dingbats Series 100	$^{E}s_{C}$(11L	1B 28 31 31 4C	Yes	No	No	Yes
	ITC Zapf Dingbats Series 200	$^{E}s_{C}$(12L	1B 28 31 32 4C	Yes	No	No	Yes
	ITC Zapf Dingbats Series 300	$^{E}s_{C}$(13L	1B 28 31 33 4C	Yes	No	No	Yes
	PS Math	$^{E}s_{C}$(5M	1B 28 35 4D	Yes	Yes	Yes	Yes
	Ventura Math	$^{E}s_{C}$(6M	1B 28 36 4D	Yes	Yes	Yes	Yes
	Math-8	$^{E}s_{C}$(8M	1B 28 38 4D	Yes	Yes	Yes	Yes
	Symbol	$^{E}s_{C}$(19M	1B 28 31 39 4D	No	Yes	Yes	Yes
	ECMA-94 Latin 1	$^{E}s_{C}$(0N	1B 28 30 4E	Yes	Yes	Yes	Yes

(A): FS-400/FS-1550/FS-3400
(B): FS-600/FS-680/FS-800/FS-1200/FS-1600/FS-1700/FS-1700+/FS-1750/FS-3700/FS-3700+/FS-3750
(C): FS-6500/FS-6700
(D): FS-7000/FS-7000+/FS-9000

Function	Parameter	Command	Hexadecimal Value	(A)	(B)	(C)	(D)
		Symbol Set Selection					
Primary Symbol Set	ISO L2	$^{E}s_{C}$(2N	1B 28 32 4E	No	Yes	Yes	Yes
	ISO L5	$^{E}s_{C}$(5N	1B 28 35 4E	No	Yes	Yes	Yes
	ISO 11: Swedish	$^{E}s_{C}$(0S	1B 28 30 53	Yes	Yes	Yes	Yes
	ISO 17: Spanish	$^{E}s_{C}$(2S	1B 28 32 53	Yes	Yes	Yes	Yes
	Windows 3.1 Latin 5	$^{E}s_{C}$(5T	1B 28 35 54	No	Yes	Yes	Yes
	PC Turkish	$^{E}s_{C}$(9T	1B 28 39 54	No	Yes	Yes	Yes
	ISO 6: ASCII	$^{E}s_{C}$(0U	1B 28 30 55	Yes	Yes	Yes	Yes
	Legal	$^{E}s_{C}$(1U	1B 28 31 55	Yes	Yes	Yes	Yes
	Roman-8	$^{E}s_{C}$(8U	1B 28 38 55	Yes	Yes	Yes	Yes
	Windows 3.0 Latin 1	$^{E}s_{C}$(9U	1B 28 39 55	Yes	Yes	Yes	Yes
	PC-8	$^{E}s_{C}$(10U	1B 28 31 30 55	Yes	Yes	Yes	Yes
	PC-8 D/N	$^{E}s_{C}$(11U	1B 28 31 31 55	Yes	Yes	Yes	Yes
	PC 850	$^{E}s_{C}$(12U	1B 28 31 32 55	Yes	Yes	Yes	Yes
	Pi Font	$^{E}s_{C}$(15U	1B 28 31 35 55	Yes	Yes	Yes	Yes
	PC-852	$^{E}s_{C}$(17U	1B 28 31 37 55	No	Yes	Yes	Yes
	Windows 3.1 Latin 1 (ANSI)	$^{E}s_{C}$(19U	1B 28 31 39 55	No	Yes	Yes	Yes
	Windows 3.1J (Japanese)	$^{E}s_{C}$(19K	1B 28 31 39 4B	No	No	No	Yes
		Spacing					
Primary Spacing	Fixed	$^{E}s_{C}$(s0P	1B 28 73 30 50	Yes	Yes	Yes	Yes
	Proportional	$^{E}s_{C}$(s1p	1B 28 73 31 50	Yes	Yes	Yes	Yes
		Pitch					
Primary Pitch	# Characters/ inch	$^{E}s_{C}$(s#H	1B 28 73 #...# 48	Yes	Yes	Yes	Yes
Set Pitch Mode	10.0	$^{E}s_{C}$&k0S	1B 26 6B 30 53	Yes	Yes	Yes	Yes
	Compressed (16.5-16.7)	$^{E}s_{C}$&k2S	1B 26 6B 32 53	Yes	Yes	Yes	Yes
	Elite (12.0)	$^{E}s_{C}$&k4S	1B 26 6B 34 53	Yes	Yes	Yes	Yes
		Point Size					
Primary Height	# Points	$^{E}s_{C}$(s#V	1B 28 73 #...# 56	Yes	Yes	Yes	Yes

(A): FS-400/FS-1550/FS-3400
(B): FS-600/FS-680/FS-800/FS-1200/FS-1600/FS-1700/FS-1700+/FS-1750/ FS-3700/FS-3700+/FS-3750
(C): FS-6500/FS-6700
(D): FS-7000/FS-7000+/FS-9000

Function	Parameter	Command	Hexadecimal Value	(A)	(B)	(C)	(D)
			Style				
Primary Style	Upright (Solid)	$^{E}s_{C}$(s0S	1B 28 73 30 53	Yes	Yes	Yes	Yes
	Italic	$^{E}s_{C}$(s1S	1B 28 73 31 53	Yes	Yes	Yes	Yes
	Condensed	$^{E}s_{C}$(s4S	1B 28 73 34 53	Yes	Yes	Yes	Yes
	Condensed Italic	$^{E}s_{C}$(s5S	1B 28 73 35 53	Yes	Yes	Yes	Yes
	Compressed (Extra Condensed)	$^{E}s_{C}$(s8S	1B 28 73 38 53	Yes	Yes	Yes	Yes
	Expanded	$^{E}s_{C}$(s24S	1B 28 73 32 34 53	Yes	Yes	Yes	Yes
	Outline	$^{E}s_{C}$(s32S	1B 28 73 33 32 53	Yes	Yes	Yes	Yes
	Inline	$^{E}s_{C}$(s64S	1B 28 73 36 34 53	Yes	Yes	Yes	Yes
	Shadowed	$^{E}s_{C}$(s128S	1B 28 73 31 32 38 53	Yes	Yes	Yes	Yes
	Outline Shadowed	$^{E}s_{C}$(s160S	1B 28 73 31 36 30 53	Yes	Yes	Yes	Yes
			Stroke Weight				
Primary Font Stroke Weight	Ultra Thin	$^{E}s_{C}$(s-7B	1B 28 73 2D 37 42	Yes	Yes	Yes	Yes
	Extra Thin	$^{E}s_{C}$(s-6B	1B 28 73 2D 36 42	Yes	Yes	Yes	Yes
	Thin	$^{E}s_{C}$(s-5B	1B 28 73 2D 35 42	Yes	Yes	Yes	Yes
	Extra Light	$^{E}s_{C}$(s-4B	1B 28 73 2D 34 42	Yes	Yes	Yes	Yes
	Light	$^{E}s_{C}$(s-3B	1B 28 73 2D 33 42	Yes	Yes	Yes	Yes
	Demi Light	$^{E}s_{C}$(s-2B	1B 28 73 2D 32 42	Yes	Yes	Yes	Yes
	Semi Light	$^{E}s_{C}$(s-1B	1B 28 73 2D 31 42	Yes	Yes	Yes	Yes
	Medium (book or text)	$^{E}s_{C}$(s0B	1B 28 73 30 42	Yes	Yes	Yes	Yes
	Semi Bold	$^{E}s_{C}$(s1B	1B 28 73 31 42	Yes	Yes	Yes	Yes
	Demi Bold	$^{E}s_{C}$(s2B	1B 28 73 32 42	Yes	Yes	Yes	Yes
	Bold	$^{E}s_{C}$(s3B	1B 28 73 33 42	Yes	Yes	Yes	Yes
	Extra Bold	$^{E}s_{C}$(s4B	1B 28 73 34 42	Yes	Yes	Yes	Yes
	Black	$^{E}s_{C}$(s5B	1B 28 73 35 42	Yes	Yes	Yes	Yes
	Extra Black	$^{E}s_{C}$(s6B	1B 28 73 36 42	Yes	Yes	Yes	Yes
	Ultra Black	$^{E}s_{C}$(s7B	1B 28 73 37 42	Yes	Yes	Yes	Yes
			Primary Typeface Family				
Typeface Family	Albertus	$^{E}s_{C}$(s4362T	1B 28 73 34 33 36 32 54	No	Yes	Yes	Yes
	Antique Olive	$^{E}s_{C}$(s4168T	1B 28 73 34 31 36 38 54	No	Yes	Yes	Yes
	Clarendon	$^{E}s_{C}$(s4140T	1B 28 73 34 31 34 30 54	No	Yes	Yes	Yes
	Coronet	$^{E}s_{C}$(s4116T	1B 28 73 34 31 31 36 54	No	Yes	Yes	Yes
	Courier	$^{E}s_{C}$(s3T	1B 28 73 33 54	Yes	Yes	Yes	Yes
	GW-Kai	$^{E}s_{C}$(s37357T	1B 28 73 33 37 33 35 37 54	No	No	No	No
	Courier	$^{E}s_{C}$(s4099T	1B 28 73 34 30 39 39 54	No	Yes	Yes	Yes

(A): FS-400/FS-1550/FS-3400
(B): FS-600/FS-680/FS-800/FS-1200/FS-1600/FS-1700/FS-1700+/FS-1750/FS-3700/FS-3700+/FS-3750
(C): FS-6500/FS-6700
(D): FS-7000/FS-7000+/FS-9000

Function	Parameter	Command	Hexadecimal Value	(A)	(B)	(C)	(D)
		Primary Typeface Family					
Typeface Family	ITC Zapf Dingbats	ESC(s4141T	1B 28 73 34 31 34 31 54	No	Yes	Yes	Yes
	Garamond Antiqua	ESC(s4197T	1B 28 73 34 31 39 37 54	No	Yes	Yes	Yes
	Letter Gothic	ESC(s4102T	1B 28 73 34 31 30 32 54	No	Yes	Yes	Yes
	LinePrinter	ESC(s0T	1B 28 73 30 54	Yes	Yes	Yes	Yes
	Marigold	ESC(s4297T	1B 28 73 34 32 39 37 54	No	Yes	Yes	Yes
	CG Omega	ESC(s4113T	1B 28 73 34 31 31 33 54	No	Yes	Yes	Yes
	CG Times	ESC(s4101T	1B 28 73 34 31 30 31 54	Yes	Yes	Yes	Yes
	Univers	ESC(s4148T	1B 28 73 34 31 34 38 54	Yes	Yes	Yes	Yes
	Arial	ESC(s16602T	1B 28 73 31 36 36 30 32 54	No	Yes	Yes	Yes
	MS Mincho	ESC(s28752T	1B 28 73 32 38 37 35 32 54	No	No	No	Yes
	MS Gothic	ESC(s28825T	1B 28 73 32 38 38 32 35 54	No	No	No	Yes
	Times New Roman	ESC(s16901T	1B 28 73 31 36 39 30	No	Yes	Yes	Yes
	SimHei	ESC(s37110T	1B 28 73 33 37 31 31 30 54	No	No	No	No
	SimSun	ESC(s37058T	1B 28 73 33 37 30 35 38 54	No	No	No	No
	Symbol	ESC(s16686T	1B 28 73 31 36 36 38 36 54	No	Yes	Yes	No
	Wingdings	ESC(s6826T	1B 28 73 36 38 32 36 54	No	No	No	No
	Wingdings	ESC(s31402T	1B 28 73 33 31 34 30 32 54	No	Yes	Yes	Yes
		Font Default					
Font Default	Primary Font	ESC(3@	1B 28 33 40	Yes	Yes	Yes	Yes
	Secondary Font	ESC)3@	1B 29 33 40	Yes	Yes	Yes	Yes
		Underline					
Underline	Enable Fixed	ESC&d0D	1B 26 64 30 44	Yes	Yes	Yes	Yes
	Enable Floating	ESC&d3D	1B 26 64 33 44	Yes	Yes	Yes	Yes
	Disable	ESC&d@	1B 26 64 40	Yes	Yes	Yes	Yes
Text Parsing Method	1-Byte	ESC&t0P	1B 26 74 30 50	No	No	No	Yes
	1-Byte	ESC&t1P	1B 26 74 31 50	No	No	No	Yes
	1-Byte/2-Byte	ESC&t21P	1B 26 74 32 31 50	No	No	No	Yes
	1-Byte/2-Byte	ESC&t31P	1B 26 74 33 31 50	No	No	No	Yes
	1-Byte/2-Byte	ESC&t38P	1B 26 74 33 38 50	No	No	No	Yes
		Transparent Print					
Transparent Print Data	# of Bytes	ESC&p#X[Data]	1B 26 70 #...# 58	Yes	Yes	Yes	Yes

(A): FS-400/FS-1550/FS-3400
(B): FS-600/FS-680/FS-800/FS-1200/FS-1600/FS-1700/FS-1700+/FS-1750/FS-3700/FS-3700+/FS-3750
(C): FS-6500/FS-6700
(D): FS-7000/FS-7000+/FS-9000

Function	Parameter	Command	Hexadecimal Value	(A)	(B)	(C)	(D)
		FONT MANAGEMENT					
Assign Font ID	Font ID #	$^{E}S_{C}$*c#D	1B 2A 63 #...# 44	Yes	Yes	Yes	Yes
Font and Character Control	Delete all Fonts	$^{E}S_{C}$*c0F	1B 2A 63 30 46	Yes	Yes	Yes	Yes
	Delete all temporary fonts	$^{E}S_{C}$*c1F	1B 2A 63 31 46	Yes	Yes	Yes	Yes
	Delete last font ID specified	$^{E}S_{C}$*c2F	1B 2A 63 32 46	Yes	Yes	Yes	Yes
	Delete last character specified	$^{E}S_{C}$*c3F	1B 2A 63 33 46	Yes	Yes	Yes	Yes
	Make font temporary	$^{E}S_{C}$*c4F	1B 2A 63 34 46	Yes	Yes	Yes	Yes
	Make font permanent	$^{E}S_{C}$*c5F	1B 2A 63 35 46	Yes	Yes	Yes	Yes
	Copy/Assign the currently invoked font as temporary	$^{E}S_{C}$*c6F	1B 2A 63 36 46	Yes	Yes	Yes	Yes
		Soft Symbol Set Management/Creation					
Set Symbol Set	ID #	$^{E}S_{C}$*c#R	1B 2A 63 #...# 52	Yes	Yes	Yes	Yes
Define Symbol Set	# of Bytes	$^{E}S_{C}$(f#W[DATA]	1B 28 66 #...# 57	Yes	Yes	Yes	Yes
Symbol Set Control	Delete all symbol sets	$^{E}S_{C}$*c0S	1B 2A 63 30 53	Yes	Yes	Yes	Yes
	Delete all temporary symbol sets	$^{E}S_{C}$*c1S	1B 2A 63 31 53	Yes	Yes	Yes	Yes
	Delete current soft symbol set (last ID#)	$^{E}S_{C}$*c2S	1B 2A 63 32 53	Yes	Yes	Yes	Yes
	Make current soft symbol set temporary	$^{E}S_{C}$*c4S	1B 2A 63 34 53	Yes	Yes	Yes	Yes
	Make current soft symbol set permanent	$^{E}S_{C}$*c5S	1B 2A 63 35 53	Yes	Yes	Yes	Yes

(A): FS-400/FS-1550/FS-3400
(B): FS-600/FS-680/FS-800/FS-1200/FS-1600/FS-1700/FS-1700+/FS-1750/FS-3700/FS-3700+/FS-3750
(C): FS-6500/FS-6700
(D): FS-7000/FS-7000+/FS-9000

Function	Parameter	Command	Hexadecimal Value	(A)	(B)	(C)	(D)
Font Selection by ID Number							
Select font (with ID #)	ID # primary font	$^{E}s_{C}$(#X	1B 28 #...# 58	Yes	Yes	Yes	Yes
	ID # secondary font	$^{E}s_{C}$)#X	1B 29 #...# 58	Yes	Yes	Yes	Yes
Soft Font Creation							
Font descriptor (font header)	# of bytes	$^{E}s_{C}$)s#W[Data]	1B 29 73 #...# 57	Yes	Yes	Yes	Yes
Download character	# of bytes	$^{E}s_{C}$(s#W[Data]	1B 28 73 #...# 57	Yes	Yes	Yes	Yes
Character code	Character code # (decimal)	$^{E}s_{C}$*c#E	1B 2A 63 #...# 45	Yes	Yes	Yes	Yes
GRAPHICS							
PCL Vector Graphics Switching/Set-Up							
Enter PCL Mode	Use previous PCL cursor position	$^{E}s_{C}$%0A	1B 25 30 41	Yes	Yes	Yes	Yes
	Use current HP-GL/2 pen position for cursor position	$^{E}s_{C}$%1A	1B 25 31 41	Yes	Yes	Yes	Yes
Enter HP-GL/2 Mode	Use Previous HP-GL/2 pen position	$^{E}s_{C}$%0B	1B 25 30 42	Yes	Yes	Yes	Yes
	Use current PCL cursor position	$^{E}s_{C}$%1B	1B 25 31 42	Yes	Yes	Yes	Yes
HP-GL/2 Plot Horizontal Size	Horizontal size in inches	$^{E}s_{C}$*c#K	1B 2A 63 #...# 48	Yes	Yes	Yes	Yes
HP-GL/2 Plot Vertical Size	Vertical size in inches	$^{E}s_{C}$*c#L	1B 2A 63 #...# 4C	Yes	Yes	Yes	Yes
Set Picture Frame Anchor Point	Set anchor point to cursor position	$^{E}s_{C}$*c0T	1B 2A 63 30 54	Yes	Yes	Yes	Yes
Picture Frame Horizontal Size	Decipoints	$^{E}s_{C}$*c#X	1B 2A 63 #...# 58	Yes	Yes	Yes	Yes
Picture Frame Vertical Size	Decipoints	$^{E}s_{C}$*c#Y	1B 2A 63 #...# 59	Yes	Yes	Yes	Yes

(A): FS-400/FS-1550/FS-3400
(B): FS-600/FS-680/FS-800/FS-1200/FS-1600/FS-1700/FS-1700+/FS-1750/FS-3700/FS-3700+/FS-3750
(C): FS-6500/FS-6700
(D): FS-7000/FS-7000+/FS-9000

Function	Parameter	Command	Hexadecimal Value	(A)	(B)	(C)	(D)
		Raster Graphics					
Raster Resolution	75 dots/inch	$^{E}S_{C}$*t75R	1B 2A 74 37 35 52	Yes	Yes	Yes	Yes
	100 dots/inch	$^{E}S_{C}$*t100R	1B 2A 74 31 30 30 52	Yes	Yes	Yes	Yes
	150 dots/inch	$^{E}S_{C}$*t150R	1B 2A 74 31 35 30 52	Yes	Yes	Yes	Yes
	200 dots/inch	$^{E}S_{C}$*t200R	1B 2A 74 32 30 30 52	No	Yes	No	Yes
	300 dots/inch	$^{E}S_{C}$*t300R	1B 2A 74 33 30 30 52	Yes	Yes	Yes	Yes
	600 dots/inch	$^{E}S_{C}$*t600R	1B 2A 74 36 30 30 52	No	Yes	No	Yes
		Orientation					
		Raster Graphics					
Raster Graphics Presentation	Follows orientation	$^{E}S_{C}$*r0F	1B 2A 72 30 46	Yes	Yes	Yes	Yes
	Follows physical page	$^{E}S_{C}$*r3F	1B 2A 72 33 46	Yes	Yes	Yes	Yes
Start Raster Graphics	Left Raster Graphics Margin	$^{E}S_{C}$*r0A	1B 2A 72 30 41	Yes	Yes	Yes	Yes
	Current Cursor	$^{E}S_{C}$*r1A	1B 2A 72 31 41	Yes	Yes	Yes	Yes
	Scale mode (logical left page boundary)	$^{E}S_{C}$*r2A	1B 2A 72 32 41	No	No	No	No
	Scale mode (at CAP)	$^{E}S_{C}$*r3A	1B 2A 72 33 42	No	No	No	No
Raster Y Offset	# of Raster Lines of vertical movement	$^{E}S_{C}$*b#Y	1B 2A 62 #...# 59	Yes	Yes	Yes	Yes
Set Raster Compression Mode	Unencoded	$^{E}S_{C}$*b0M	1B 2A 62 30 4D	Yes	Yes	Yes	Yes
	Run-Length Encoded	$^{E}S_{C}$*b1M	1B 2A 62 31 4D	Yes	Yes	Yes	Yes
	Tagged Image File Format	$^{E}S_{C}$*b2M	1B 2A 62 32 4D	Yes	Yes	Yes	Yes
	Delta Row	$^{E}S_{C}$*b3M	1B 2A 62 33 4D	Yes	Yes	Yes	Yes
	Adaptive compression	$^{E}S_{C}$*b5M	1B 2A 62 35 4D	No	Yes	Yes	Yes
	Replacement Delta Row	$^{E}S_{C}$*b9M	1B 2A 98 39 4D	No	No	No	No
Transfer Raster Data by row	# of Bytes	$^{E}S_{C}$*b#W [Data]	1B 2A 62 #...# 57	Yes	Yes	Yes	Yes
Transfer Raster Data (by plane)	# of Bytes	$^{E}S_{C}$*b#V [Data]	1B 2A 98 #...# 56	No	No	No	No

(A): FS-400/FS-1550/FS-3400
(B): FS-600/FS-680/FS-800/FS-1200/FS-1600/FS-1700/FS-1700+/FS-1750/FS-3700/FS-3700+/FS-3750
(C): FS-6500/FS-6700
(D): FS-7000/FS-7000+/FS-9000

Function	Parameter	Command	Hexadecimal Value	(A)	(B)	(C)	(D)
		Orientation					
		Raster Graphics					
End Raster Graphics	Old version	$^{E}S_{C}$*rB	1B 2A 72 42	Yes	Yes	Yes	Yes
	Preferred	$^{E}S_{C}$*rC	1B 2A 72 43	No	Yes	Yes	Yes
Raster Height	# Raster Rows	$^{E}S_{C}$*r#T	1B 2A 72 #...# 54	Yes	Yes	Yes	Yes
Raster Width	# Pixels of the Specified Resolution	$^{E}S_{C}$*r#S	1B 2A 72 #...# 53	Yes	Yes	Yes	Yes
		THE PRINT MODEL					
		Imaging					
Select Current Pattern	Solid Black (default)	$^{E}S_{C}$*v0T	1B 2A 76 30 54	Yes	Yes	Yes	Yes
	Solid White	$^{E}S_{C}$*v1T	1B 2A 76 31 54	Yes	Yes	Yes	Yes
	HP-defined Shading Pattern	$^{E}S_{C}$*v2T	1B 2A 76 32 54	Yes	Yes	Yes	Yes
	HP-defined Cross-Hatched Pattern	$^{E}S_{C}$*v3T	1B 2A 76 33 54	Yes	Yes	Yes	Yes
	User defined pattern	$^{E}S_{C}$*v4T	1B 2A 76 34 54	No	Yes	Yes	Yes
Source Transparency Mode	Transparent	$^{E}S_{C}$*v0N	1B 2A 76 30 4E	Yes	Yes	Yes	Yes
	Opaque	$^{E}S_{C}$*v1N	1B 2A 76 31 4E	Yes	Yes	Yes	Yes
Pattern Transparency Mode	Transparent	$^{E}S_{C}$*v0O	1B 2A 76 30 4F	Yes	Yes	Yes	Yes
	Opaque	$^{E}S_{C}$*v1O	1B 2A 76 31 4F	Yes	Yes	Yes	Yes
Logical Operation	# = ROP3 input value	$^{E}S_{C}$*ℓ#O	1B 2A 6C #...# 4F	No	No	No	Yes
Pixel Placement	Grid Intersection	$^{E}S_{C}$*v0R	1B 2A 6C 30 52	No	No	No	Yes
	Pixel Placement	$^{E}S_{C}$*v1R	1B 2A 76 31 52	No	No	No	Yes
		Rectangle Dimensions					
Rectangle Width (Horizontal Size)	# of dots	$^{E}S_{C}$*c#A	1B 2A 63 #...# 41	Yes	Yes	Yes	Yes
	# of decipoints	$^{E}S_{C}$*c#H	1B 2A 63 #...# 48	Yes	Yes	Yes	Yes
Rectangle Height (Vertical Size)	# of dots	$^{E}S_{C}$*c#B	1B 2A 63 #...# 42	Yes	Yes	Yes	Yes
	# of decipoints	$^{E}S_{C}$*c#V	1B 2A 63 #...# 56	Yes	Yes	Yes	Yes

(A): FS-400/FS-1550/FS-3400
(B): FS-600/FS-680/FS-800/FS-1200/FS-1600/FS-1700/FS-1700+/FS-1750/FS-3700/FS-3700+/FS-3750
(C): FS-6500/FS-6700
(D): FS-7000/FS-7000+/FS-9000

Function	Parameter	Command	Hexadecimal Value	(A)	(B)	(C)	(D)
		Rectangular Area Fill					
Fill Rectangular Area	Solid Black	$^{E}S_{C}$*c0P	1B 2A 63 30 50	Yes	Yes	Yes	Yes
	Erase (solid white fill)	$^{E}S_{C}$*c1P	1B 2A 63 31 50	Yes	Yes	Yes	Yes
	Shaded Fill	$^{E}S_{C}$*c2P	1B 2A 63 32 50	Yes	Yes	Yes	Yes
	Cross-hatched Fill	$^{E}S_{C}$*c3P	1B 2A 63 33 50	Yes	Yes	Yes	Yes
	User-Defined	$^{E}S_{C}$*c4P	1B 2A 63 34 50	No	Yes	Yes	Yes
	Current Pattern	$^{E}S_{C}$*c5P	1B 2A 63 35 50	Yes	Yes	Yes	Yes
Pattern ID	% of Shading or Type of Pattern or User Pattern ID	$^{E}S_{C}$*c#G	1B 2A 63 #...# 47	Yes	Yes	Yes	Yes
Shading	2% Gray	$^{E}S_{C}$*c2G	1B 2A 63 32 47	Yes	Yes	Yes	Yes
	10% Gray	$^{E}S_{C}$*c10G	1B 2A 63 31 30 47	Yes	Yes	Yes	Yes
	15% Gray	$^{E}S_{C}$*c15G	1B 2A 63 31 35 47	Yes	Yes	Yes	Yes
	30% Gray	$^{E}S_{C}$*c30G	1B 2A 63 33 30 47	Yes	Yes	Yes	Yes
	45% Gray	$^{E}S_{C}$*c45G	1B 2A 63 34 35 47	Yes	Yes	Yes	Yes
	70% Gray	$^{E}S_{C}$*c70G	1B 2A 63 37 30 47	Yes	Yes	Yes	Yes
	90% Gray	$^{E}S_{C}$*c90G	1B 2A 63 39 30 47	Yes	Yes	Yes	Yes
	100% Gray	$^{E}S_{C}$*c100G	1B 2A 63 31 30 30 47	Yes	Yes	Yes	Yes
Pattern	1 Horiz.Line	$^{E}S_{C}$*c1G	1B 2A 63 31 47	Yes	Yes	Yes	Yes
	2 Vert. Lines	$^{E}S_{C}$*c2G	1B 2A 63 32 47	Yes	Yes	Yes	Yes
	3 Diagonal Lines	$^{E}S_{C}$*c3G	1B 2A 63 33 47	Yes	Yes	Yes	Yes
	4 Diagonal Lines	$^{E}S_{C}$*c4G	1B 2A 63 34 47	Yes	Yes	Yes	Yes
	5 Square Grid	$^{E}S_{C}$*c5G	1B 2A 63 35 47	Yes	Yes	Yes	Yes
	6 Diagonal Grid	$^{E}S_{C}$*c6G	1B 2A 63 36 47	Yes	Yes	Yes	Yes

(A): FS-400/FS-1550/FS-3400
(B): FS-600/FS-680/FS-800/FS-1200/FS-1600/FS-1700/FS-1700+/FS-1750/FS-3700/FS-3700+/FS-3750
(C): FS-6500/FS-6700
(D): FS-7000/FS-7000+/FS-9000

Function	Parameter	Command	Hexadecimal Value	(A)	(B)	(C)	(D)
USER DEFINED PATTERN / MANAGEMENT CREATION							
Define Pattern	# of bytes	$^{E}s_{C}$*c#W[Data]	1B 2A 63 #...# 57	No	Yes	Yes	Yes
User-Defined Pattern Control	Delete all patterns	$^{E}s_{C}$*c0Q	1B 2A 63 030 51	No	Yes	Yes	Yes
	Delete all temporary patterns	$^{E}s_{C}$*c1Q	1B 2A 63 031 51	No	Yes	Yes	Yes
	Delete current pattern	$^{E}s_{C}$*c2Q	1B 2A 63 032 51	No	Yes	Yes	Yes
	Make pattern temporary	$^{E}s_{C}$*c4Q	1B 2A 63 034 51	No	Yes	Yes	Yes
	Make pattern permanent	$^{E}s_{C}$*c5Q	1B 2A 63 035 51	No	Yes	Yes	Yes
Set Pattern Reference	Rotate with orientation	$^{E}s_{C}$*p0R	1B 2A 70 30 52	No	Yes	Yes	Yes
Point	Follow physical page	$^{E}s_{C}$*p1R	1B 2A 70 31 52	No	Yes	Yes	Yes
MACROS							
Macro ID	Macro ID #	$^{E}s_{C}$&f#Y	1B 26 66 #...# 59	Yes	Yes	Yes	Yes
Macro Control	Start Macro Definition	$^{E}s_{C}$&f0X	1B 26 66 30 58	Yes	Yes	Yes	Yes
	Stop Macro Definition	$^{E}s_{C}$&f1X	1B 26 66 31 58	Yes	Yes	Yes	Yes
	Execute Macro	$^{E}s_{C}$&f2X	1B 26 66 32 58	Yes	Yes	Yes	Yes
	Call Macro	$^{E}s_{C}$&f3X	1B 26 66 33 58	Yes	Yes	Yes	Yes
	Enable Overlay	$^{E}s_{C}$&f4X	1B 26 66 34 58	Yes	Yes	Yes	Yes
	Disable Overlay	$^{E}s_{C}$&f5X	1B 26 66 35 58	Yes	Yes	Yes	Yes
	Delete Macros	$^{E}s_{C}$&f6X	1B 26 66 36 58	Yes	Yes	Yes	Yes
	Delete All Temp. Macros	$^{E}s_{C}$&f7X	1B 26 66 37 58	Yes	Yes	Yes	Yes
	Delete Macro ID	$^{E}s_{C}$&f8X	1B 26 66 38 58	Yes	Yes	Yes	Yes
	Make Temporary	$^{E}s_{C}$&f9X	1B 26 66 39 58	Yes	Yes	Yes	Yes
	Make Permanent	$^{E}s_{C}$&f10X	1B 26 66 31 30 58	Yes	Yes	Yes	Yes

(A): FS-400/FS-1550/FS-3400
(B): FS-600/FS-680/FS-800/FS-1200/FS-1600/FS-1700/FS-1700+/FS-1750/FS-3700/FS-3700+/FS-3750
(C): FS-6500/FS-6700
(D): FS-7000/FS-7000+/FS-9000

Function	Parameter	Command	Hexadecimal Value	(A)	(B)	(C)	(D)
		Status Readback					
Set Status Readback Location Type	Invalid Location	$^{E}S_{C}$*s0T	1B 2A 73 30 54	No	Yes	Yes	Yes
	Currently Selected	$^{E}S_{C}$*s1T	1B 2A 73 31 54	No	Yes	Yes	Yes
	All Locations	$^{E}S_{C}$*s2T	1B 2A 73 32 54	No	Yes	Yes	Yes
	Internal	$^{E}S_{C}$*s3T	1B 2A 73 33 54	No	Yes	Yes	Yes
	Downloaded	$^{E}S_{C}$*s4T	1B 2A 73 34 54	No	Yes	Yes	Yes
	Cartridge	$^{E}S_{C}$*s5T	1B 2A 73 35 54	No	Yes	Yes	Yes
	User-lnstalled ROM (SIMMs)	$^{E}S_{C}$*s7T	1B 2A 73 37 54	No	Yes	Yes	Yes
Set Status Readback Location Unit	All entities of the Location Type	$^{E}S_{C}$*s0U	1B 2A 73 30 55	No	Yes	Yes	Yes
	Entity 1 or Temporary	$^{E}S_{C}$*s1U	1B 2A 73 31 55	No	Yes	Yes	Yes
	Entity 2 or Permanent	$^{E}S_{C}$*s2U	1B 2A 73 32 55	No	Yes	Yes	Yes
	Entity 3	$^{E}S_{C}$*s3U	1B 2A 73 33 55	No	Yes	Yes	Yes
	Entity 4	$^{E}S_{C}$*s4U	1B 2A 73 34 55	No	Yes	Yes	Yes
Inquire Status Readback Entity	Font	$^{E}S_{C}$*s0I	1B 2A 73 30 49	No	Yes	Yes	Yes
	Macro	$^{E}S_{C}$*s1I	1B 2A 73 31 49	No	Yes	Yes	Yes
	User-defined Pattern	$^{E}S_{C}$*s2I	1B 2A 73 32 49	No	Yes	Yes	Yes
	Symbol Set	$^{E}S_{C}$*s3I	1B 2A 73 33 49	No	Yes	Yes	Yes
	Font Extended	$^{E}S_{C}$*s4I	1B 2A 73 34 49	No	Yes	Yes	Yes
Flush All Pages	Flush all complete pages	$^{E}S_{C}$&r0F	1B 26 72 30 46	No	Yes	Yes	Yes
	Flush all page data	$^{E}S_{C}$&r1F	1B 26 72 31 46	No	Yes	Yes	Yes
Free Memory Space	Request free memory status	$^{E}S_{C}$*s1M	1B 2A 73 31 4D	No	Yes	Yes	Yes
Echo	# = Echo value (-32767 to 32767)	$^{E}S_{C}$*s#X	1B 2A 73 #...# 58	No	Yes	Yes	Yes
		PROGRAMMING HINTS					
End-of-Line Wrap	Enabled	$^{E}S_{C}$&s0C	1B 26 73 30 43	Yes	Yes	Yes	Yes
	Disabled	$^{E}S_{C}$&s1C	1B 26 73 31 43	Yes	Yes	Yes	Yes
Display Functions	ON	$^{E}S_{C}$Y	1B 59	Yes	Yes	Yes	Yes
	OFF	$^{E}S_{C}$Z	1B 5A	Yes	Yes	Yes	Yes

(A): FS-400/FS-1550/FS-3400
(B): FS-600/FS-680/FS-800/FS-1200/FS-1600/FS-1700/FS-1700+/FS-1750/FS-3700/FS-3700+/FS-3750
(C): FS-6500/FS-6700
(D): FS-7000/FS-7000+/FS-9000

Function	Parameter	Command	Hexadecimal Value	(A)	(B)	(C)	(D)
PCL Vector Graphics Switching/Set-Up Picture Frame							
Enter PCL Mode	Use previous PCL cursor position	$^{E}s_{C}$%0A	1B 25 30 41	Yes	Yes	Yes	Yes
	Use current HP-GL/2 pen position for cursor position	$^{E}s_{C}$%1A	1B 25 31 41	Yes	Yes	Yes	Yes
Enter HP-GL/2 Mode	Use Previous HP-GL/2 pen position	$^{E}s_{C}$%0B	1B 25 30 42	Yes	Yes	Yes	Yes
	Use current PCL cursor position	$^{E}s_{C}$%1B	1B 25 31 42	Yes	Yes	Yes	Yes
	Current PCL coordinate system/old HPGL pen position	$^{E}s_{C}$%2B	1B 25 32 42	No	No	No	No
	Current PCL coordinate system/current PCL CAP	$^{E}s_{C}$%3B	1B 25 33 42	No	No	No	No
HP-GL/2 Plot Horizontal Size	Horizontal size in inches	$^{E}s_{C}$*c#K	1B 2A 63 #...# 4B	Yes	Yes	Yes	Yes
HP-GL/2 Plot Vertical Size	Vertical size in inches	$^{E}s_{C}$*c#L	1B 2A 63 #...# 4C	Yes	Yes	Yes	Yes
Set Picture Frame Anchor Point	Set anchor point to cursor position	$^{E}s_{C}$*c0T	1B 2A 63 30 54	Yes	Yes	Yes	Yes
Picture Frame Horizontal Size	Decipoints	$^{E}s_{C}$*c#X	1B 2A 63 #...# 58	Yes	Yes	Yes	Yes
Picture Frame Vertical Size	Decipoints	$^{E}s_{C}$*c#Y	1B 2A 63 #...# 59	Yes	Yes	Yes	Yes

(A): FS-400/FS-1550/FS-3400
(B): FS-600/FS-680/FS-800/FS-1200/FS-1600/FS-1700/FS-1700+/FS-1750/FS-3700/FS-3700+/FS-3750
(C): FS-6500/FS-6700
(D): FS-7000/FS-7000+/FS-9000

HP-GL/2 Context Printer Commands

COMMAND	MNEMONIC	PARAMETERS
	DUAL CONTEXT EXTENSIONS	
ENTER PCL MODE	$^{E}S_{C}$%#A	0 Retain previous PCL cursor position 1 Use current HP-GL/2 pen position
RESET	$^{E}S_{C}$E	None
PRIMARY FONT	Fl	Font_lD
SECONDARY FONT	FN	Font_lD
SCALABLE OR BITMAPPED FONTS	SB	0 - Scalable fonts only 1 - Bitmapped fonts allowed
PALETTE EXTENSIONS		
Color Range	CR	[b_ref_red, w_ref_red, b_ref_grn, w_ref_grn, b_ref_blue, w_ref_blue];
Number of Pens	NP	[n];
Pen Color Assignment	PC	[pen [,red, green, blue]];
TRANSPARENCY MODE	TR	0 - Off (opaque) 1 - On (transparent)
SCREENED VECTORS	SV	[screen_type[,shading[,index]]]
	VECTOR GROUP *Parameters in brackets are optional.	
ARC ABSOLUTE	AA	x_center,y_center,sweep_angle [,chord_angle];
ARC RELATIVE	AR	x_increment,y_increment,sweep_angle [,chord_angle];
ABSOLUTE ARC THREE POINT	AT	x_inter,y_inter,x_end,y_end [,chord_angle];
PLOT ABSOLUTE	PA	[x,y...[,x,y]];
PLOT RELATIVE	PR	[x,y...[,x,y]];
PEN DOWN	PD	[x,y...[,x,y]];
PEN UP	PU	[x,y...[,x,y]];
RELATIVE ARC THREE POINT	RT	x_incr_inter,y_incr_inter,x_incr_end, y_incr-end [,chord_angle];
POLYLINE ENCODED	PE	[flag[val]coord_pair...[flag[val]coord_pair]];

COMMAND	MNEMONIC	PARAMETERS*
	POLYGON GROUP	
	*Parameters in brackets are optional.	
BEZIER ABSOLUTE	BZ (FS-1600/3600/ 6500 only)	kind, x1_control_pt, y1_control_pt x2_control_pt, y2_control_pt x3_control_pt, y3_contorl_pt [,params ... [,params]];
BEZIER RELATIVE	BR	kind, x1_control_pt_increments, y1 _control_pt_increments, x2_control_pt increments, y2_control_ pt_increments, x3_control_pt_increments, y3_control_pt_increments, [,params ... [,params]];
CIRCLE	Cl	radius [,chord_angle];
FILL RECTANGLE ABSOLUTE	RA	x_coordinate,y_coordinate;
FILL RECTANGLE RELATIVE	RR	x_increment,y_increment;
EDGE RECTANGLE ABSOLUTE	EA	x_coordinate,y_coordinate;
EDGE RECTANGLE RELATIVE	ER	x_increment,y_increment;
FILL WEDGE	WG	radius,start_angle, sweep_angle [,chord_angle];
EDGE WEDGE	EW	radius,start_angle, sweep_angle[,chord_angle];
POLYGON MODE	PM	polygon_definition;
FILL POLYGON	FP	
EDGE POLYGON	EP	

COMMAND	MNEMONIC	PARAMETERS
CHARACTER GROUP		
*Parameters in brackets are optional.		
SELECT STANDARD FONT	SS	None
SELECT ALTERNATE FONT	SA	None
ABSOLUTE DIRECTION	Dl	[run,rise];
RELATIVE DIRECTION	DR	[run,rise];
ABSOLUTE CHARACTER SIZE	Sl	[width,height];
RELATIVE CHARACTER SIZE	SR	[width,height];
CHARACTER SLANT	SL	[tangent_of_angle];
EXTRA SPACE	ES	[width[,height]]
STANDARD FONT DEFINITION	SD	[kind,value...[,kind,value]];
ALTERNATE FONT DEFINITION	AD	[kind,value...[,kind,value]];
CHARACTER FILL MODE	CF	[fill_mode[,edge_pen]];
LABEL ORIGIN	LO	[position];LABEL
LABEL	LB	[char...[,char]]lbterm
DEFINE LABEL TERMINATOR	DT	[1bterm[,mode]];
CHARACTER PLOT	CP	[spaces,lines];
TRANSPARENT DATA	TD	[mode];
DEFINE VARIABLE TEXT PATH	DV	[path[,line]];
LINE AND FILL ATTRIBUTES GROUP		
*Parameters in brackets are optional.		
LINE TYPE	LT	[line_type[,pattern_length[,mode]]];
LINE ATTRIBUTES	LA	[kind,value...[,kind,value]];
PEN WIDTH	PW	[width[,pen]];
PEN WIDTH UNIT SELECTION	WU	[type];
SELECT PEN	SP	[pen]; (required, 1 for black or O for white)
SYMBOL MODE	SM	[char];
FILL TYPE	FT	[fill_type[,option1 [,option2]]];
ANCHOR CORNER	AC	[x_coordinate,y_coordinate];
RASTER FILL DEFINITION	RF	[index[,width,height,pen_nbr...pen_nbr]]; (width and height must be less than 255)
USER DEFINED LINE TYPE	UL	[index[,gap1...gapn]];
CONFIGURATION AND STATUS GROUP		
*Parameters in brackets are optional.		
Advance Full Page	PG	[n];
SCALE	SC	[x1,x2,y1,y2[,type[,left,bottom]]]; or [x1,xfactor,y1,yfactor,2];
INPUT WINDOW	IW	[xLL,yLL,xUR,yUR];
INPUT P1 AND P2	IP	[p1x,p1y[,p2x,p2y]];
INPUT RELATIVE P1 AND P2	IR	[p1x,p1y[,p2x,p2y]];
DEFAULT VALUES	DF	
INITIALIZE	IN	[n];
Replot	RP	[n];
ROTATE COORDINATE SYSTEM	RO	[angle];

TECHNICAL GRAPHICS EXTENSION		
Begin Plot	BP	[kind, value...[,kind, value]];
Chord Tolerance Mode	CT	[mode];
Download Character	DL	[charnum [[,up], x, y...[,up],x,y]];
Frame Advance	FR	
Media Type	MT	[type];
Merge Control	MC	[mode [, opcod]];
Output Error	OE	
Output Hardclip Limits	OH	
Output Identification	OI	
Output P1 and P2	OP	
Output Status	OS	
Pixel Placement	PP	[mode];
Plot Size	PS	[length [,width]];
Quality Level	QL	[quality level]

* Parameters in brackets are optional.

PJL Syntax Comparison

Suggested Syntax Rules	
[ ]	Items in brackets “[. . .]” indicate optional parameters.
< >	Identifies a control code character
Special Identifiers	
<HT>	Horizontal tab character (ASCII 9).
<LF>	Line feed character (ASCII 10).
<CR>	Carriage return character (ASCII 13).
<SP>	Space character (ASCII 32).
<WS>	White space
<ESC>	Escape character (ASCII 27).
<FF>	Form feed character (ASCII 12).
<Words>	Printable characters (ASCII characters 33 through 126) and <WS>
PJL Commands	
COMMENT	@PJL COMMENT <Words> [<CR>] <LF>
DEFAULT	@PJL DEFAULT [LPARM: personality] variable = value [<CR>] <LF>
DINQUIRE	@PJL DINQUIRE [LPARM: personality] variable [<CR>] <LF>
Response	@PJL DINQUIRE [LPARM: personality] variable <CR> <LF> value <CR> <LF> <FF>
ECHO	@PJL ECHO [<Words>] [<CR>] <LF>
Response	@PJL ECHO [<Words>] <CR> <LF> <FF>
ENTER	@PJL ENTER LANGUAGE = personality[<CR>] <LF>
EOJ	@PJL EOJ [NAME = job name] [<CR>] <LF>
INFO	@PJL INFO read only variable [<CR>] <LF>
Response	@PJL INFO read only variable <CR> <LF> [1 or more lines of printable characters or <WS> followed by <CR> <LF>]<FF>
INITIALIZE	@PJL INITIALIZE [<CR>] <LF>
INQUIRE	@PJL INQUIRE [LPARM: personality] variable [<CR>] <LF>
Response	@PJL INQUIRE [LPARM: personality] variable <CR> <LF> value <CR> <LF> <FF>
JOB	@ PJL JOB [NAME = “job name”] [START
OPMSG	@PJL OPMSG DISPLAY = “message” [<CR>] <LF>,
RDYMSG	@PJL RDYMSG DISPLAY = “message” [<CR>] <LF>,
RESET	@PJL RESET [<CR>] <LF>
SET	@PJL SET [LPARM: personality] variable = value [<CR>] <LF>,
STMSG	@PJL STMSG DISPLAY = “message” [<CR>] <LF>,
Response	@PJL STMSG DISPLAY = “message” <CR> <LF>
UEL/SPJL	<ESC>%-12345X
USTATUS	@PJL USTATUS variable = value [<CR>] <LF>,
Response	@PJL USTATUS variable <CR> <LF> [1 or more lines of printable characters or <WS> followed by <CR> <LF>]<FF>,
USTATUSOFF	@PJL USTATUSOFF [<CR>] <LF>
PJL	@PJL [<CR>] <LF>

LaserJet Symbol Sets

LaserJet ISO 60 Norway (0D)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	128	144	160	¯ 176	â 192	Å 208	Á 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	· 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Ð 227	µ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	– 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	Æ 91	k 107	æ 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	< 60	L 76	Ø 92	l 108	ø 124	140	156	˜ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	13	29	- 45	= 61	M 77	Å 93	m 109	å 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	> 62	N 78	ˆ 94	n 110	¯ 126	142	158	Û 174	ƒ 190	ö 206	ß 222	Ÿ 238	± 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▚ 127	143	159	£ 175	¢ 191	ü 207	Ô 223	ÿ 239	255

LaserJet ISO 61 Roman Extension (0E)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	¯ 48	â 64	Å 80	Á 96	Þ 112	128	144	160	0 176	@ 192	P 208	‘ 224	p 240
1	1	17	À 33	Ý 49	ê 65	î 81	Ã 97	þ 113	129	145	! 161	1 177	A 193	Q 209	a 225	q 241
2	2	18	Â 34	ý 50	ô 66	Ø 82	ã 98	· 114	130	146	" 162	2 178	B 194	R 210	b 226	r 242
3	3	19	È 35	° 51	û 67	Æ 83	Đ 99	µ 115	131	147	# 163	3 179	C 195	S 211	c 227	s 243
4	4	20	Ê 36	Ç 52	á 68	å 84	ð 100	¶ 116	132	148	$ 164	4 180	D 196	T 212	d 228	t 244
5	5	21	Ë 37	ç 53	é 69	í 85	Í 101	¾ 117	133	149	% 165	5 181	E 197	U 213	e 229	u 245
6	6	22	Î 38	Ñ 54	ó 70	ø 86	Ì 102	– 118	134	150	& 166	6 182	F 198	V 214	f 230	v 246
7	7	23	Ï 39	ñ 55	ú 71	æ 87	Ó 103	¼ 119	135	151	’ 167	7 183	G 199	W 215	g 231	w 247
8	8	24	´ 40	¡ 56	à 72	Ä 88	Ò 104	½ 120	136	152	(168	8 184	H 200	X 216	h 232	x 248
9	9	25	` 41	¿ 57	è 73	ì 89	Õ 105	ª 121	137	153	) 169	9 185	I 201	Y 217	i 233	y 249
A	10	26	ˆ 42	¤ 58	ò 74	Ö 90	õ 106	º 122	138	154	* 170	: 186	J 202	Z 218	j 234	z 250
B	11	27	¨ 43	£ 59	ù 75	Ü 91	Š 107	« 123	139	155	+ 171	; 187	K 203	[219	k 235	{ 251
C	12	28	˜ 44	¥ 60	ä 76	É 92	š 108	■ 124	140	156	, 172	< 188	L 204	\ 220	l 236	| 252
D	13	29	Ù 45	§ 61	ë 77	ï 93	Ú 109	» 125	141	157	- 173	= 189	M 205	] 221	m 237	} 253
E	14	30	Û 46	ƒ 62	ö 78	ß 94	Ÿ 110	± 126	142	158	. 174	> 190	N 206	^ 222	n 238	~ 254
F	15	31	£ 47	¢ 63	ü 79	Ô 95	ÿ 111	127	143	159	/ 175	? 191	O 207	_ 223	o 239	▚ 255

LaserJet ISO 25 French (0F)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	à 64	P 80	` 96	p 112	128	144	160	¯ 176	â 192	Å 208	Á 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	· 242
3	3	19	£ 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Ð 227	µ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	— 246
7	7	23	’ 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	° 91	k 107	é 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	< 60	L 76	ç 92	l 108	ù 124	140	156	˜ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	13	29	- 45	= 61	M 77	§ 93	m 109	è 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	> 62	N 78	ˆ 94	n 110	¨ 126	142	158	Û 174	ƒ 190	ö 206	ß 222	Ÿ 238	± 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▩ 127	143	159	£ 175	¢ 191	ü 207	Ô 223	ÿ 239	255

LaserJet ISO 25 German (0G)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	§ 64	P 80	` 96	p 112	128	144	160	¯ 176	â 192	Å 208	Á 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	· 242
3	3	19	£ 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Đ 227	µ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	– 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	Ä 91	k 107	ä 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	< 60	L 76	Ö 92	l 108	ö 124	140	156	˜ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	13	29	- 45	= 61	M 77	Ü 93	m 109	ü 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	> 62	N 78	ˆ 94	n 110	ß 126	142	158	Û 174	ƒ 190	ö 206	ß 222	Ÿ 238	± 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▩ 127	143	159	£ 175	ç 191	ü 207	Ô 223	ÿ 239	255

LaserJet ISO 15 Italian (0I)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	§ 64	P 80	ù 96	p 112	128	144	160	¯ 176	â 192	Å 208	Á 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	· 242
3	3	19	£ 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Đ 227	µ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	– 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	° 91	k 107	à 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	< 60	L 76	ç 92	l 108	ò 124	140	156	˜ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	13	29	- 45	= 61	M 77	é 93	m 109	è 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	> 62	N 78	ˆ 94	n 110	ì 126	142	158	Û 174	*f* 190	ö 206	ß 222	Ÿ 238	± 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▩ 127	143	159	£ 175	ç 191	ü 207	Ô 223	ÿ 239	255

LaserJet ISO 14 JIS ASCII (0K)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	128	144	160	‾ 176	â 192	Å 208	Á 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	· 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Đ 227	µ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	— 246
7	7	23	’ 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	< 60	L 76	¥ 92	l 108	| 124	140	156	˜ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	> 62	N 78	ˆ 94	n 110	‾ 126	142	158	Û 174	*f* 190	ö 206	ß 222	Ÿ 238	± 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▩ 127	143	159	£ 175	¢ 191	ü 207	Ô 223	ÿ 239	255

LaserJet ECMA-94 Latin 1 (0N)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				°	À	Đ	à	ð
	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1			!	1	A	Q	a	q			¡	±	Á	Ñ	á	ñ
	1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
2			"	2	B	R	b	r			¢	²	Â	Ò	â	ò
	2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
3			#	3	C	S	c	s			£	³	Ã	Ó	ã	ó
	3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
4			$	4	D	T	d	t			¤	´	Ä	Ô	ä	ô
	4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
5			%	5	E	U	e	u			¥	µ	Å	Õ	å	õ
	5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
6			&	6	F	V	f	v			¦	¶	Æ	Ö	æ	ö
	6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
7			'	7	G	W	g	w			§	·	Ç	×	ç	÷
	7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
8			(	8	H	X	h	x			¨	¸	È	Ø	è	ø
	8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
9			)	9	I	Y	i	y			©	¹	É	Ù	é	ù
	9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
A			*	:	J	Z	j	z			ª	º	Ê	Ú	ê	ú
	10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
B			+	;	K	[	k	{			«	»	Ë	Û	ë	û
	11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
C			,	<	L	\	l	|			¬	¼	Ì	Ü	ì	ü
	12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
D			-	=	M	]	m	}			-	½	Í	Ý	í	ý
	13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
E			.	>	N	^	n	~			®	¾	Î	Þ	î	þ
	14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
F			/	?	O	_	o				¯	¿	Ï	ß	ï	ÿ
	15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

LaserJet ISO 11 Swedish (0S)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	É 64	P 80	é 96	p 112	128	144	160	¯ 176	â 192	Å 208	Á 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	· 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Ð 227	µ 243
4	4	20	¤ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	— 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	Ä 91	k 107	ä 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	< 60	L 76	Ö 92	l 108	ö 124	140	156	˜ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	13	29	- 45	= 61	M 77	Å 93	m 109	å 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	> 62	N 78	Ü 94	n 110	ü 126	142	158	Û 174	ƒ 190	ö 206	ß 222	Ÿ 238	± 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▚ 127	143	159	£ 175	¢ 191	ü 207	Ô 223	ÿ 239	255

LaserJet ISO 6 ASCII (0U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	‘ 96	p 112	128	144	160	¯ 176	â 192	Å 208	Á 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	· 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Ð 227	µ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	– 246
7	7	23	’ 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	˜ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	Û 174	*f* 190	ö 206	ß 222	Ÿ 238	± 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▚ 127	143	159	£ 175	¢ 191	ü 207	Ô 223	ÿ 239	255

LaserJet ISO 61 Norwegian (1D)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	128	144	160	¯ 176	â 192	Å 208	Á 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	· 242
3	3	19	§ 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Đ 227	µ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	— 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	Æ 91	k 107	æ 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	< 60	L 76	Ø 92	l 108	ø 124	140	156	˜ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	13	29	- 45	= 61	M 77	Å 93	m 109	å 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	> 62	N 78	ˆ 94	n 110	| 126	142	158	Û 174	ƒ 190	ö 206	ß 222	Ÿ 238	± 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▩ 127	143	159	£ 175	ç 191	ü 207	Ô 223	ÿ 239	255

LaserJet ISO 4 U.K. (1E)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	128	144	160	¯ 176	â 192	Å 208	Á 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	· 242
3	3	19	£ 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Ð 227	µ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	– 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	˜ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	¯ 126	142	158	Û 174	ƒ 190	ö 206	ß 222	Ÿ 238	± 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▩ 127	143	159	£ 175	¢ 191	ü 207	Ô 223	ÿ 239	255

LaserJet ISO 69 French (1F)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	à 64	P 80	µ 96	p 112	128	144	160	¯ 176	â 192	Å 208	Á 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	· 242
3	3	19	£ 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Đ 227	µ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	— 246
7	7	23	’ 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	° 91	k 107	é 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	< 60	L 76	ç 92	l 108	ù 124	140	156	˜ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	13	29	- 45	= 61	M 77	§ 93	m 109	è 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	> 62	N 78	ˆ 94	n 110	¨ 126	142	158	Û 174	ƒ 190	ö 206	ß 222	Ÿ 238	± 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▩ 127	143	159	£ 175	¢ 191	ü 207	Ô 223	ÿ 239	255

LaserJet ISO 21 German (1G)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	§ 64	P 80	` 96	p 112	128	144	160	¯ 176	â 192	Å 208	Á 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	· 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Đ 227	µ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	– 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	Ä 91	k 107	ä 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	< 60	L 76	Ö 92	l 108	ö 124	140	156	˜ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	13	29	- 45	= 61	M 77	Ü 93	m 109	ü 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	> 62	N 78	ˆ 94	n 110	ß 126	142	158	Û 174	ƒ 190	ö 206	ß 222	Ÿ 238	± 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▩ 127	143	159	£ 175	¢ 191	ü 207	Ô 223	ÿ 239	255

LaserJet ISO 15 Spanish (1S)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	128	144	160	¯ 176	â 192	Å 208	Á 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	· 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Đ 227	µ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	— 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	¡ 91	k 107	{ 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	< 60	L 76	Ñ 92	l 108	ñ 124	140	156	˜ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	13	29	- 45	= 61	M 77	¿ 93	m 109	} 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	> 62	N 78	° 94	n 110	˜ 126	142	158	Û 174	ƒ 190	ö 206	ß 222	Ÿ 238	± 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▒ 127	143	159	£ 175	¢ 191	ü 207	Ô 223	ÿ 239	255

LaserJet Legal (1U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	° 96	p 112	128	144	160	176	192	208	224	240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	161	177	193	209	225	241
2	2	18	″ 34	2 50	B 66	R 82	b 98	r 114	130	146	162	178	194	210	226	242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	163	179	195	211	227	243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	164	180	196	212	228	244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	165	181	197	213	229	245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	166	182	198	214	230	246
7	7	23	′ 39	7 55	G 71	W 87	g 103	w 119	135	151	167	183	199	215	231	247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	168	184	200	216	232	248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	169	185	201	217	233	249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	170	186	202	218	234	250
B	11	27	+ 43	; 59	K 75	[91	k 107	§ 123	139	155	171	187	203	219	235	251
C	12	28	, 44	= 60	L 76	® 92	l 108	¶ 124	140	156	172	188	204	220	236	252
D	13	29	- 45	= 61	M 77	] 93	m 109	† 125	141	157	173	189	205	221	237	253
E	14	30	. 46	¢ 62	N 78	© 94	n 110	™ 126	142	158	174	190	206	222	238	254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▞ 127	143	159	175	191	207	223	239	255

LaserJet ISO 57 Chinese (2K)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	128	144	160	¯ 176	â 192	Å 208	Á 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	· 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Ð 227	µ 243
4	4	20	¥ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	– 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	˜ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	> 62	N 78	ˆ 94	n 110	¯ 126	142	158	Û 174	ƒ 190	ö 206	ß 222	Ÿ 238	± 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▩ 127	143	159	£ 175	ç 191	ü 207	Ô 223	ÿ 239	255

LaserJet ISO Latin 2 (2N)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	128	144	160	° 176	Ŕ 192	Đ 208	ŕ 224	đ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	Ą 161	ą 177	Á 193	Ń 209	á 225	ń 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	˘ 162	˛ 178	Â 194	Ň 210	â 226	ň 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	Ł 163	ł 179	Ă 195	Ô 211	ă 227	ô 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	¤ 164	´ 180	Ä 196	Ő 212	ä 228	ő 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ľ 165	ľ 181	Ĺ 197	Ö 213	ĺ 229	ö 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Ś 166	ś 182	Ć 198	× 214	ć 230	÷ 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	§ 167	¸ 183	Ç 199	× 215	ç 231	÷ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	¨ 168	˛ 184	Č 200	Ř 216	č 232	ř 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	Š 169	š 185	É 201	Ů 217	é 233	ů 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	Ş 170	ş 186	Ę 202	Ú 218	ę 234	ú 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	Ť 171	ť 187	Ë 203	Ű 219	ë 235	ű 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	Ź 172	ź 188	Ě 204	Ü 220	ě 236	ü 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	- 173	˝ 189	Í 205	Ý 221	í 237	ý 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	Ž 174	ž 190	Î 206	Ţ 222	î 238	ţ 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▒ 127	143	159	Ż 175	ż 191	Ď 207	ß 223	ď 239	˙ 255

LaserJet ISO 17 Spanish (2S)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	§ 64	P 80	` 96	p 112	128	144	160	¯ 176	â 192	Å 208	Á 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	· 242
3	3	19	£ 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Đ 227	µ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	— 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	¡ 91	k 107	° 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	< 60	L 76	Ñ 92	l 108	ñ 124	140	156	˜ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	13	29	- 45	= 61	M 77	¿ 93	m 109	ç 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	> 62	N 78	ˆ 94	n 110	˜ 126	142	158	Û 174	ƒ 190	ö 206	ß 222	Ÿ 238	± 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▩ 127	143	159	£ 175	¢ 191	ü 207	Ô 223	ÿ 239	255

LaserJet ISO 2 IRV (2U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	128	144	160	¯ 176	â 192	Å 208	Á 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	· 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Ð 227	µ 243
4	4	20	¤ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	— 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	˜ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	> 62	N 78	ˆ 94	n 110	¯ 126	142	158	Û 174	ƒ 190	ö 206	ß 222	Ÿ 238	± 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▞ 127	143	159	£ 175	ç 191	ü 207	Ô 223	ÿ 239	255

LaserJet PC Cyrillic (3R)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p	А	Р	а	⠿	└	╨	р	Ё
	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1	☺	◄	!	1	A	Q	a	q	Б	С	б	▒	┴	╤	с	ё
	1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
2	☻	↕	"	2	B	R	b	r	В	Т	в	▓	┬	╥	т	Є
	2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
3	♥	‼	#	3	C	S	c	s	Г	У	г	│	├	╙	у	є
	3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
4	♦	¶	$	4	D	T	d	t	Д	Ф	д	┤	─	╘	ф	Ї
	4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
5	♣	§	%	5	E	U	e	u	Е	Х	е	╡	┼	╒	х	ї
	5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
6	♠	▬	&	6	F	V	f	v	Ж	Ц	ж	╢	╞	╓	ц	Ў
	6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
7	●	↨	'	7	G	W	g	w	З	Ч	з	╖	╟	╫	ч	ў
	7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
8	◘	↑	(	8	H	X	h	x	И	Ш	и	╕	╚	╪	ш	°
	8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
9	○	↓	)	9	I	Y	i	y	Й	Щ	й	╣	╔	┘	щ	·
	9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
A	◙	→	*	:	J	Z	j	z	К	Ъ	к	║	╩	┌	ъ	·
	10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
B	♂	←	+	;	K	[	k	{	Л	Ы	л	╗	╦	█	ы	√
	11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
C	♀	∟	,	<	L	\	l	|	М	Ь	м	╝	╠	▄	ь	№
	12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
D	♪	↔	-	=	M	]	m	}	Н	Э	н	╜	═	▌	э	¤
	13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
E	♫	▲	.	>	N	^	n	~	О	Ю	о	╛	╬	▐	ю	■
	14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
F	☼	▼	/	?	O	_	o	⌂	П	Я	п	┐	╧	▬	я	
	15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

LaserJet ISO 10 Swedish (3S)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	128	144	160	¯ 176	â 192	Å 208	Á 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	· 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Đ 227	µ 243
4	4	20	¤ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	— 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	Ä 91	k 107	ä 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	< 60	L 76	Ö 92	l 108	ö 124	140	156	˜ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	13	29	- 45	= 61	M 77	Å 93	m 109	å 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	> 62	N 78	ˆ 94	n 110	¯ 126	142	158	Û 174	*f* 190	ö 206	ß 222	Ÿ 238	± 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▩ 127	143	159	£ 175	ç 191	ü 207	Ô 223	ÿ 239	255

LaserJet ISO 16 Portuguese (4S)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	§ 64	P 80	` 96	p 112	128	144	160	¯ 176	â 192	Å 208	Á 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	· 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Ð 227	µ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	— 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	Ã 91	k 107	ã 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	< 60	L 76	Ç 92	l 108	ç 124	140	156	˜ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	13	29	- 45	= 61	M 77	Õ 93	m 109	õ 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	> 62	N 78	ˆ 94	n 110	° 126	142	158	Û 174	ƒ 190	ö 206	ß 222	Ÿ 238	± 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▩ 127	143	159	£ 175	¢ 191	ü 207	Ô 223	ÿ 239	255

LaserJet PS Math (5M)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1	1	17	! 33	1 49	A 65	Θ 81	α 97	θ 113	129	145	ϒ 161	± 177	ℑ 193	∇ 209	⟨ 225	⟩ 241
2	2	18	∀ 34	2 50	B 66	P 82	β 98	ρ 114	130	146	′ 162	″ 178	ℜ 194	® 210	® 226	∫ 242
3	3	19	# 35	3 51	X 67	Σ 83	χ 99	σ 115	131	147	≤ 163	≥ 179	℘ 195	© 211	© 227	⌠ 243
4	4	20	∃ 36	4 52	Δ 68	T 84	δ 100	τ 116	132	148	/ 164	× 180	⊗ 196	TM 212	TM 228	⎮ 244
5	5	21	% 37	5 53	E 69	Y 85	ε 101	υ 117	133	149	∞ 165	∝ 181	⊕ 197	∏ 213	Σ 229	⌡ 245
6	6	22	& 38	6 54	Φ 70	ς 86	ϕ 102	ϖ 118	134	150	ƒ 166	∂ 182	∅ 198	✓ 214	⎛ 230	⎞ 246
7	7	23	∋ 39	7 55	Γ 71	Ω 87	γ 103	ω 119	135	151	♣ 167	• 183	∩ 199	· 215	⎜ 231	⎟ 247
8	8	24	(40	8 56	H 72	Ξ 88	η 104	ξ 120	136	152	♦ 168	÷ 184	∪ 199	¬ 216	⎝ 232	⎠ 248
9	9	25	) 41	9 57	I 73	Ψ 89	ι 105	ψ 121	137	153	♥ 169	≠ 185	⊃ 201	∧ 217	⎡ 233	⎤ 249
A	10	26	* 42	: 58	ϑ 74	Z 90	φ 106	ζ 122	138	154	♠ 170	≡ 186	⊇ 202	∨ 218	⎢ 234	⎥ 250
B	11	27	+ 43	; 59	K 75	[91	κ 107	{ 123	139	155	↔ 171	≈ 187	⊄ 203	⇔ 219	⎣ 235	⎦ 251
C	12	28	, 44	< 60	Λ 76	∴ 92	λ 108	| 124	140	156	← 172	… 188	⊂ 204	⇐ 220	⎧ 236	⎫ 252
D	13	29	− 45	= 61	M 77	] 93	μ 109	} 125	141	157	↑ 173	| 189	⊆ 205	⇑ 221	{ 237	} 253
E	14	30	. 46	> 62	N 78	⊥ 94	ν 110	∼ 126	142	158	→ 174	— 190	∈ 206	⇒ 222	⎨ 238	⎬ 254
F	15	31	/ 47	? 63	O 79	_ 95	ο 111	127	143	159	↓ 175	↵ 191	∉ 207	⇓ 223	⎮ 239	255

LaserJet ISO Latin 5 (5N)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	128	144	160	° 176	À 192	Ğ 208	à 224	ğ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	¡ 161	± 177	Á 193	Ñ 209	á 225	ñ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	¢ 162	² 178	Â 194	Ò 210	â 226	ò 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	£ 163	³ 179	Ã 195	Ó 211	ã 227	ó 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	¤ 164	´ 180	Ä 196	Ô 212	ä 228	ô 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	¥ 165	µ 181	Å 197	Õ 213	å 229	õ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	¦ 166	¶ 182	Æ 198	Ö 214	æ 230	ö 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	§ 167	· 183	Ç 199	× 215	ç 231	÷ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	¨ 168	¸ 184	È 200	Ø 216	è 232	ø 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	© 169	¹ 185	É 201	Ù 217	é 233	ù 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ª 170	º 186	Ê 202	Ú 218	ê 234	ú 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	« 171	» 187	Ë 203	Û 219	ë 235	û 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	¬ 172	¼ 188	Ì 204	Ü 220	ì 236	ü 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	- 173	½ 189	Í 205	İ 221	í 237	ı 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	® 174	¾ 190	Î 206	Ş 222	î 238	ş 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▒ 127	143	159	¯ 175	¿ 191	Ï 207	ß 223	ï 239	ÿ 255

LaserJet ISO 84 Portuguese (5S)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	´ 64	P 80	` 96	p 112	128	144	160	¯ 176	â 192	Å 208	Á 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	· 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Ð 227	µ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	– 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	Ã 91	k 107	ã 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	< 60	L 76	Ç 92	l 108	ç 124	140	156	˜ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	13	29	- 45	= 61	M 77	Õ 93	m 109	õ 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	Û 174	ƒ 190	ö 206	ß 222	Ÿ 238	± 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▩ 127	143	159	£ 175	¢ 191	ü 207	Ô 223	ÿ 239	255

LaserJet ISO Windows Latin 5 (5T)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	€ 128	144	160	° 176	À 192	Ğ 208	à 224	ğ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	‘ 145	¡ 161	± 177	Á 193	Ñ 209	á 225	ñ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	, 130	’ 146	¢ 162	² 178	Â 194	Ò 210	â 226	ò 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	ƒ 131	“ 147	£ 163	³ 179	Ã 195	Ó 211	ã 227	ó 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	„ 132	” 148	¤ 164	´ 180	Ä 196	Ô 212	ä 228	ô 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	… 133	• 149	¥ 165	µ 181	Å 197	Õ 213	å 229	õ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	† 134	– 150	¦ 166	¶ 182	Æ 198	Ö 214	æ 230	ö 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	‡ 135	— 151	§ 167	· 183	Ç 199	× 215	ç 231	÷ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	ˆ 136	˜ 152	¨ 168	¸ 184	È 200	Ø 216	è 232	ø 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	‰ 137	™ 153	© 169	¹ 185	É 201	Ù 217	é 233	ù 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	Š 138	š 154	ª 170	º 186	Ê 202	Ú 218	ê 234	ú 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	‹ 139	› 155	« 171	» 187	Ë 203	Û 219	ë 235	û 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	Œ 140	œ 156	¬ 172	¼ 188	Ì 204	Ü 220	ì 236	ü 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	- 173	½ 189	Í 205	İ 221	í 237	ı 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	® 174	¾ 190	Î 206	Ş 222	î 238	ş 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▒ 127	143	Ÿ 159	¯ 175	¿ 191	Ï 207	ß 223	ï 239	ÿ 255

LaserJet Microsoft Publishing (6J)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	48	2 64	80	‘ 96	112	128	144	160	° 176	192	208	Ω 224	240
1	1	17	1 33	49	65	81	97	113	129	145	′ 161	● 177	ˋ 193	ˋ 209	225	241
2	2	18	” 34	50	66	℞ 82	98	114	130	146	″ 162	● 178	´ 194	´ 210	226	242
3	3	19	3 35	51	67	Š 83	℅ 99	š 115	131	147	ˆ 163	● 179	ˆ 195	ˆ 211	227	243
4	4	20	4 36	52	68	™ 84	100	116	132	148	~ 164	○ 180	˜ 196	˜ 212	228	244
5	5	21	5 37	53	69	85	101	117	133	149	165	○ 181	¯ 197	¯ 213	229	ı 245
6	6	22	7 38	54	70	86	102	118	134	150	166	◯ 182	˘ 198	˘ 214	IJ 230	ij 246
7	7	23	’ 39	55	71	87	103	119	135	151	167	■ 183	˙ 199	˙ 215	L· 231	l· 247
8	8	24	9 40	56	72	88	104	120	136	152	168	■ 184	¨ 200	¨ 216	Ł 232	ł 248
9	9	25	0 41	57	73	Ÿ 89	105	121	137	153	fi 169	■ 185	201	217	233	249
A	10	26	8 42	58	74	Ž 90	106	ž 122	138	154	fl 170	□ 186	° 202	° 218	234	250
B	11	27	† 43	59	75	91	107	123	139	155	ff 171	□ 187	¸ 203	¸ 219	235	251
C	12	28	‚ 44	„ 60	Ľ 76	92	ℓ 108	124	140	156	ffi 172	□ 188	204	220	236	252
D	13	29	— 45	‡ 61	— 77	93	109	125	141	157	ffl 173	‰ 189	˝ 205	˝ 221	237	253
E	14	30	… 46	62	– 78	6 94	110	“ 126	142	Pt 158	‹ 174	◆ 190	˛ 206	˛ 222	238	254
F	15	31	/ 47	63	Œ 79	‗ 95	œ 111	127	143	ƒ 159	› 175	◇ 191	ˇ 207	ˇ 223	’n 239	255

LaserJet Ventura Math (6M)

(Excludes models in which Agfa fonts are installed.)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	48	≅ 64	Π 80	‾ 96	π 112	128	144	◇ 160	® 176	≤ 192	↓ 208	| 224	∏ 240
1	1	17	! 33	1 49	Α 65	Θ 81	α 97	θ 113	129	145	✓ 161	⊃ 177	♦ 193	← 209	· 225	TM 241
2	2	18	∀ 34	2 50	Β 66	Ρ 82	β 98	ρ 114	130	146	⎩ 162	⊇ 178	≥ 194	® 210	∠ 226	⇐ 242
3	3	19	# 35	3 51	Χ 67	Σ 83	χ 99	σ 115	131	147	⎡ 163	⎛ 179	∂ 195	″ 211	⎭ 227	⇔ 243
4	4	20	∃ 36	4 52	Δ 68	Τ 84	δ 100	τ 116	132	148	⎪ 164	180	ℵ 196	ƒ 212	228	∨ 244
5	5	21	% 37	5 53	Ε 69	Υ 85	ε 101	υ 117	133	149	⎣ 165	♣ 181	′ 197	ℑ 213	⎨ 229	∑ 245
6	6	22	& 38	6 54	Φ 70	ς 86	φ 102	ϖ 118	134	150	⎩ 166	⊕ 182	ℜ 198	© 214	⎮ 230	TM 246
7	7	23	∋ 39	7 55	Γ 71	Ω 87	γ 103	ω 119	135	151	⎪ 167	⊗ 183	℘ 199	± 215	⟩ 231	| 247
8	8	24	(40	8 56	Η 72	Ξ 88	η 104	ξ 120	136	152	⇑ 168	⊆ 184	∞ 200	→ 216	232	⎭ 248
9	9	25	) 41	9 57	Ι 73	Ψ 89	ι 105	ψ 121	137	153	⇒ 169	∪ 185	♠ 201	↑ 217	¬ 233	∅ 249
A	10	26	* 42	: 58	ϑ 74	Ζ 90	φ 106	ζ 122	138	154	⇓ 170	— 186	∝ 202	≠ 218	∇ 234	∩ 250
B	11	27	+ 43	; 59	Κ 75	[91	κ 107	{ 123	139	↵ 155	⊄ 171	… 187	• 203	≡ 219	⎮ 235	∈ 251
C	12	28	, 44	< 60	Λ 76	∴ 92	λ 108	| 124	140	→ 156	⊂ 172	| 188	/ 204	° 220	| 236	© 252
D	13	29	− 45	= 61	Μ 77	] 93	μ 109	} 125	141	␣ 157	⎭ 173	∧ 189	♥ 205	↔ 221	⎫ 237	∉ 253
E	14	30	. 46	> 62	Ν 78	⊥ 94	ν 110	∼ 126	142	▪ 158	| 174	↲ 190	× 206	⎤ 222	⎭ 238	⎫ 254
F	15	31	/ 47	? 63	Ο 79	_ 95	ο 111	127	143	□ 159	} 175	≈ 191	ϒ 207	∫ 223	÷ 239	⟨ 255

LaserJet ISO8859/10 Latin 6 (6N)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	128	144	160	° 176	Ā 192	Đ 208	ā 224	ð 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	Ą 161	ą 177	Á 193	Ņ 209	á 225	ņ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Ē 162	ē 178	Â 194	Ō 210	â 226	ō 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	Ģ 163	ģ 179	Ã 195	Ó 211	ã 227	ó 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ī 164	ī 180	Ä 196	Ô 212	ä 228	ô 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ĩ 165	ĩ 181	Å 197	Õ 213	å 229	õ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Ķ 166	ķ 182	Æ 198	Ö 214	æ 230	ö 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	§ 167	· 183	Į 199	Ũ 215	ĩ 231	ũ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	Ļ 168	ļ 184	Č 200	Ø 216	č 232	ø 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	Đ 169	đ 185	É 201	Ų 217	é 233	ų 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	Š 170	š 186	Ę 202	Ú 218	ę 234	ú 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	Ŧ 171	ŧ 187	Ë 203	Û 219	ë 235	û 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	Ž 172	ž 188	Ė 204	Ü 220	ė 236	ü 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	- 173	— 189	Í 205	Ý 221	í 237	ý 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	Ū 174	ū 190	Î 206	Þ 222	î 238	þ 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▒ 127	143	159	Ŋ 175	ŋ 191	Ï 207	ß 223	ï 239	255

LaserJet ISO 85 Spanish (6S)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	· 64	P 80	` 96	p 112	128	144	160	¯ 176	â 192	Å 208	Á 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	· 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Đ 227	µ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	– 246
7	7	23	’ 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	¡ 91	k 107	´ 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	< 60	L 76	Ñ 92	l 108	ñ 124	140	156	˜ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	13	29	- 45	= 61	M 77	Ç 93	m 109	ç 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	> 62	N 78	¿ 94	n 110	¨ 126	142	158	Û 174	ƒ 190	ö 206	ß 222	Ÿ 238	± 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▒ 127	143	159	£ 175	¢ 191	ü 207	Ô 223	ÿ 239	255

LaserJet Desktop (7J)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	‘ 96	p 112	128	144	160	“ 176	— 192	‹ 208	a 224	´ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	¶ 161	” 177	± 193	› 209	o 225	` 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	§ 162	µ 178	× 194	« 210	æ 226	ˆ 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	† 163	‰ 179	÷ 195	» 211	Æ 227	¨ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	‡ 164	• 180	° 196	, 212	ð 228	˜ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	© 165	● 181	′ 197	„ 213	Đ 229	ˇ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	® 166	○ 182	″ 198	· 214	ij 230	˘ 246
7	7	23	’ 39	7 55	G 71	W 87	g 103	w 119	135	151	™ 167	○ 183	¼ 199	¡ 215	IJ 231	˝ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	℅ 168	■ 184	½ 200	¿ 216	ł 232	° 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	¢ 169	■ 185	¾ 201	Pt 217	Ł 233	˙ 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	– 170	□ 186	1 202	ℓ 218	œ 234	¯ 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	— 171	□ 187	2 203	£ 219	Œ 235	¸ 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	… 172	' 188	3 204	¥ 220	ø 236	˛ 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	fi 173	¬ 189	/ 205	¤ 221	Ø 237	· 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	fl 174	¦ 190	206	*f* 222	þ 238	ı 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▞ 127	143	159	175	═ 191	207	ß 223	Þ 239	255

LaserJet Greek-8 (8G)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	‘ 96	p 112	128	144	160	176	192	Ο 208	ύ 224	ο 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	161	177	Α 193	Π 209	α 225	π 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	162	178	Β 194	Ρ 210	β 226	ρ 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	163	179	Γ 195	Σ 211	γ 227	σ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	164	180	Δ 196	Τ 212	δ 228	τ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	165	181	Ε 197	Υ 213	ε 229	υ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	166	182	Ζ 198	Φ 214	ζ 230	φ 246
7	7	23	’ 39	7 55	G 71	W 87	g 103	w 119	135	151	167	183	Η 199	215	η 231	ς 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	168	184	Θ 200	Χ 216	θ 232	χ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	169	185	Ι 201	Ψ 217	ι 233	ψ 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	170	186	202	Ω 218	234	ω 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	171	187	Κ 203	ά 219	κ 235	έ 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	172	188	Λ 204	ή 220	λ 236	ί 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	173	189	Μ 205	ό 221	μ 237	ώ 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	174	190	Ν 206	222	ν 238	· 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▚ 127	143	159	175	191	Ξ 207	223	ξ 239	255

LaserJet Math-8 (8M)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1	1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
2	2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
3	3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
4	4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
5	5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
6	6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
7	7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
8	8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
9	9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
A	10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
B	11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
C	12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
D	13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
E	14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
F	15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

LaserJet Turkish-8 (8T)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	‘ 96	p 112	128	144	160	¯ 176	â 192	Å 208	ğ 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	Ç 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Ğ 162	ý 178	ô 194	Ø 210	ã 226	· 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Đ 227	µ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	– 246
7	7	23	’ 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	¨ 171	£ 187	ù 203	İ 219	Š 235	ı 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	˜ 172	¥ 188	ä 204	Ö 220	š 236	ö 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	Ù 173	§ 189	ë 205	Ş 221	Ú 237	ş 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	Û 174	*f* 190	ö 206	Ü 222	Ÿ 238	ü 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▞ 127	143	159	£ 175	¢ 191	ü 207	ç 223	ÿ 239	255

LaserJet 8U Roman-8 (8U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	‘ 96	p 112	128	144	160	¯ 176	â 192	Å 208	Á 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	· 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Ð 227	µ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	— 246
7	7	23	’ 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	˜ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	Û 174	*f* 190	ö 206	ß 222	Ÿ 238	± 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▩ 127	143	159	£ 175	¢ 191	ü 207	Ô 223	ÿ 239	255

LaserJet Windows Latin 2 (9E)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	€ 128	144	160	° 176	Ŕ 192	Đ 208	ŕ 224	đ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	‘ 145	ˇ 161	± 177	Á 193	Ń 209	á 225	ń 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	, 130	’ 146	˘ 162	˛ 178	Â 194	Ň 210	â 226	ň 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	“ 147	Ł 163	ł 179	Ă 195	Ó 211	ă 227	ó 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	„ 132	” 148	¤ 164	´ 180	Ä 196	Ô 212	ä 228	ô 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	… 133	• 149	Ą 165	µ 181	Ĺ 197	Ő 213	Í 229	ő 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	† 134	– 150	¦ 166	¶ 182	Ć 198	Ö 214	ć 230	ö 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	‡ 135	— 151	§ 167	· 183	Ç 199	× 215	ç 231	÷ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	¨ 168	¸ 184	Č 200	Ř 216	č 232	ř 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	‰ 137	™ 153	© 169	ą 185	É 201	Ů 217	é 233	ů 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	Š 138	š 154	Ş 170	ş 186	Ę 202	Ú 218	ę 234	ú 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	‹ 139	› 155	« 171	» 187	Ë 203	Ű 219	ë 235	ű 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	Ś 140	ś 156	¬ 172	Ľ 188	Ě 204	Ü 220	ě 236	ü 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	Ť 141	ť 157	- 173	˝ 189	Í 205	Ý 221	í 237	ý 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ž 142	ž 158	® 174	ľ 190	Î 206	Ţ 222	î 238	ţ 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▩ 127	Ź 143	ź 159	Ż 175	ż 191	Ď 207	ß 223	ď 239	˙ 255

LaserJet Windows 3.1 Latin/Greek (9G)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	€ 128	144	160	° 176	ΐ 192	Π 208	ΰ 224	π 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	‘ 145	΅ 161	± 177	Α 193	Ρ 209	α 225	ρ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	, 130	’ 146	Ά 162	² 178	Β 194	210	β 226	ς 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	ƒ 131	“ 147	£ 163	³ 179	Γ 195	Σ 211	γ 227	σ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	„ 132	” 148	¤ 164	΄ 180	Δ 196	Τ 212	δ 228	τ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	… 133	• 149	¥ 165	μ 181	Ε 197	Υ 213	ε 229	υ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	† 134	– 150	¦ 166	¶ 182	Ζ 198	Φ 214	ζ 230	φ 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	‡ 135	— 151	§ 167	· 183	Η 199	Χ 215	η 231	χ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	¨ 168	Έ 184	Θ 200	Ψ 216	θ 232	ψ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	‰ 137	™ 153	© 169	Ή 185	Ι 201	Ω 217	ι 233	ω 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ª 170	Ί 186	Κ 202	Ϊ 218	κ 234	ϊ 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	‹ 139	› 155	« 171	» 187	Λ 203	Ϋ 219	λ 235	ϋ 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	¬ 172	Ό 188	Μ 204	ά 220	μ 236	ό 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	- 173	½ 189	Ν 205	έ 221	ν 237	ύ 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	® 174	Ύ 190	Ξ 206	ή 222	ξ 238	ώ 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▞ 127	143	159	— 175	Ώ 191	Ο 207	ί 223	ο 239	255

LaserJet PC-1004 (9J)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	128	144	160	° 176	À 192	Ð 208	à 224	ð 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	‘ 145	¡ 161	± 177	Á 193	Ñ 209	á 225	ñ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	, 130	’ 146	¢ 162	² 178	Â 194	Ò 210	â 226	ò 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	“ 147	£ 163	³ 179	Ã 195	Ó 211	ã 227	ó 243
4	¯ 4	20	$ 36	4 52	D 68	T 84	d 100	t 116	„ 132	” 148	¤ 164	´ 180	Ä 196	Ô 212	ä 228	ô 244
5	˘ 5	21	% 37	5 53	E 69	U 85	e 101	u 117	… 133	• 149	¥ 165	µ 181	Å 197	Õ 213	å 229	õ 245
6	˙ 6	22	& 38	6 54	F 70	V 86	f 102	v 118	† 134	– 150	¦ 166	¶ 182	Æ 198	Ö 214	æ 230	ö 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	‡ 135	— 151	§ 167	· 183	Ç 199	× 215	ç 231	÷ 247
8	° 8	24	(40	8 56	H 72	X 88	h 104	x 120	ˆ 136	˜ 152	¨ 168	¸ 184	È 200	Ø 216	è 232	ø 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	‰ 137	™ 153	© 169	¹ 185	É 201	Ù 217	é 233	ù 249
A	˝ 10	26	* 42	: 58	J 74	Z 90	j 106	z 122	Š 138	š 154	ª 170	º 186	Ê 202	Ú 218	ê 234	ú 250
B	˛ 11	27	+ 43	; 59	K 75	[91	k 107	{ 123	‹ 139	› 155	« 171	» 187	Ë 203	Û 219	ë 235	û 251
C	ˇ 12	28	, 44	< 60	L 76	\ 92	l 108	| 124	Œ 140	œ 156	¬ 172	¼ 188	Ì 204	Ü 220	ì 236	ü 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	- 173	½ 189	Í 205	Ý 221	í 237	ý 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	® 174	¾ 190	Î 206	Þ 222	î 238	þ 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	143	Ÿ 159	¯ 175	¿ 191	Ï 207	ß 223	ï 239	ÿ 255

LaserJet Ventura Dingbats (9L)

(Excludes models in which Agfa fonts are installed.)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1	1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
2	2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
3	3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
4	4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
5	5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
6	6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
7	7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
8	8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
9	9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
A	10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
B	11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
C	12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
D	13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
E	14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
F	15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

LaserJet Windows 3.1 Latin/Cyrillic (9R)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	Ђ 128	ђ 144	160	° 176	А 192	Р 208	а 224	р 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	Ѓ 129	‘ 145	Ў 161	± 177	Б 193	С 209	б 225	с 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	‚ 130	’ 146	ў 162	І 178	В 194	Т 210	в 226	т 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	ѓ 131	“ 147	Ј 163	і 179	Г 195	У 211	г 227	у 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	„ 132	” 148	¤ 164	ґ 180	Д 196	Ф 212	д 228	ф 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	… 133	• 149	Ґ 165	µ 181	Е 197	Х 213	е 229	х 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	† 134	– 150	¦ 166	¶ 182	Ж 198	Ц 214	ж 230	ц 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	‡ 135	— 151	§ 167	· 183	З 199	Ч 215	з 231	ч 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	€ 136	152	Ё 168	ё 184	И 200	Ш 216	и 232	ш 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	‰ 137	™ 153	© 169	№ 185	Й 201	Щ 217	й 233	щ 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	Љ 138	љ 154	Є 170	є 186	К 202	Ъ 218	к 234	ъ 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	‹ 139	› 155	« 171	» 187	Л 203	Ы 219	л 235	ы 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	Њ 140	њ 156	¬ 172	j 188	М 204	Ь 220	м 236	ь 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	Ќ 141	ќ 157	- 173	S 189	Н 205	Э 221	н 237	э 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ћ 142	ћ 158	® 174	s 190	О 206	Ю 222	о 238	ю 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▒ 127	Џ 143	џ 159	Ї 175	ї 191	П 207	Я 223	п 239	я 255

LaserJet PC Turkish (9T)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	░ 176	└ 192	╩ 208	α 224	≡ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▒ 177	┴ 193	╤ 209	ß 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	Ğ 166	╢ 182	╞ 198	╓ 214	μ 230	÷ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	ğ 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	İ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	· 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	¢ 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	n 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	ı 141	¥ 157	¡ 173	╜ 189	═ 205	▌ 221	ϕ 237	2 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	Ş 158	« 174	╛ 190	╬ 206	▐ 222	ϵ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Å 143	ş 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	255

LaserJet Windows (9U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	128	144	160	° 176	À 192	Ð 208	à 224	ð 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	‘ 145	¡ 161	± 177	Á 193	Ñ 209	á 225	ñ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	’ 146	¢ 162	² 178	Â 194	Ò 210	â 226	ò 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	£ 163	³ 179	Ã 195	Ó 211	ã 227	ó 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	¤ 164	´ 180	Ä 196	Ô 212	ä 228	ô 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	¥ 165	µ 181	Å 197	Õ 213	å 229	õ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	¦ 166	¶ 182	Æ 198	Ö 214	æ 230	ö 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	§ 167	· 183	Ç 199	× 215	ç 231	÷ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	¨ 168	¸ 184	È 200	Ø 216	è 232	ø 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	© 169	¹ 185	É 201	Ù 217	é 233	ù 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ª 170	º 186	Ê 202	Ú 218	ê 234	ú 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	« 171	» 187	Ë 203	Û 219	ë 235	û 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	¬ 172	¼ 188	Ì 204	Ü 220	ì 236	ü 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	- 173	½ 189	Í 205	Ý 221	í 237	ý 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	® 174	¾ 190	Î 206	Þ 222	î 238	þ 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▚ 127	143	159	¯ 175	¿ 191	Ï 207	ß 223	ï 239	ÿ 255

LaserJet PC-851 Latin/Greek (10G)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	Ί 144	ϊ 160	⠿ 176	└ 192	T 208	ζ 224	- 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	145	ΐ 161	▒ 177	┴ 193	Y 209	η 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Ό 146	ό 162	▓ 178	┬ 194	Φ 210	θ 226	υ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ύ 163	│ 179	├ 195	X 211	ι 227	φ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	A 164	┤ 180	─ 196	Ψ 212	κ 228	χ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	Ύ 149	B 165	K 181	┼ 197	Ω 213	λ 229	§ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	Ά 134	û 150	Γ 166	Λ 182	Π 198	α 214	μ 230	ψ 246
7	● 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	Δ 167	M 183	P 199	β 215	ν 231	¸ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	Ώ 152	E 168	N 184	╚ 200	γ 216	ξ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	Z 169	╣ 185	╔ 201	┘ 217	ο 233	¨ 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	H 170	║ 186	╩ 202	┌ 218	π 234	ω 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	ά 155	½ 171	╗ 187	╦ 203	█ 219	ρ 235	ϋ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	Θ 172	╝ 188	╠ 204	▄ 220	σ 236	ΰ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	Έ 141	έ 157	I 173	Ξ 189	═ 205	δ 221	ς 237	ώ 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	ή 158	« 174	O 190	╬ 206	ε 222	τ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Ή 143	ί 159	» 175	┐ 191	Σ 207	▬ 223	΄ 239	255

LaserJet PS Text (10J)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	‘ 96	p 112	128	144	160	176	192	— 208	224	240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	¡ 161	– 177	` 193	209	Æ 225	æ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	¢ 162	† 178	´ 194	210	226	242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	£ 163	‡ 179	ˆ 195	211	ª 227	243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	/ 164	· 180	˜ 196	212	228	244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	¥ 165	181	¯ 197	213	229	ı 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	ƒ 166	¶ 182	˘ 198	214	230	246
7	7	23	’ 39	7 55	G 71	W 87	g 103	w 119	135	151	§ 167	• 183	˙ 199	215	231	247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	¤ 168	¸ 184	¨ 200	216	Ł 232	ł 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	' 169	„ 185	201	217	Ø 233	ø 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	“ 170	” 186	° 202	218	Œ 234	œ 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	« 171	» 187	˛ 203	219	º 235	ß 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	‹ 172	… 188	204	220	236	252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	› 173	‰ 189	˝ 205	221	237	253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	fi 174	190	˛ 206	222	238	254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	127	143	159	fl 175	¿ 191	ˇ 207	223	239	255

LaserJet PS ITC Zapf Dingbats (10L/14L)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1	1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
2	2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
3	3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
4	4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
5	5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
6	6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
7	7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
8	8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
9	9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
A	10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
B	11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
C	12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
D	13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
E	14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
F	15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

LaserJet ISO8859/5 Latin/Cyrillic (10N)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	128	144	160	А 176	Р 192	а 208	р 224	№ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	Ё 161	Б 177	С 193	б 209	с 225	ё 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Ђ 162	В 178	Т 194	в 210	т 226	ђ 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	Ѓ 163	Г 179	У 195	г 211	у 227	ѓ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Є 164	Д 180	Ф 196	д 212	ф 228	є 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	S 165	Е 181	Х 197	е 213	х 229	s 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	І 166	Ж 182	Ц 198	ж 214	ц 230	і 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	Ї 167	З 183	Ч 199	з 215	ч 231	ї 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	J 168	И 184	Ш 200	и 216	ш 232	j 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	Љ 169	Й 185	Щ 201	й 217	щ 233	љ 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	Њ 170	К 186	Ъ 202	к 218	ъ 234	њ 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	Ћ 171	Л 187	Ы 203	л 219	ы 235	ћ 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	Ќ 172	М 188	Ь 204	м 220	ь 236	ќ 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	- 173	Н 189	Э 205	н 221	э 237	§ 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	Ў 174	О 190	Ю 206	о 222	ю 238	ў 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▒ 127	143	159	Џ 175	П 191	Я 207	п 223	я 239	џ 255

LaserJet PC-855 Cyrillic/Serbia (10R)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p	ђ	љ	а	⠿	└	л	Я	-
	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1	☺	◄	!	1	A	Q	a	q	Ђ	Л	А	▒	┴	Л	р	ы
	1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
2	☻	↕	"	2	B	R	b	r	ѓ	ањ	б	▓	┬	м	Р	Ы
	2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
3	♥	‼	#	3	C	S	c	s	Ѓ	Њ	Б	│	├	М	с	з
	3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
4	♦	¶	$	4	D	T	d	t	ё	ћ	ц	┤	─	н	С	З
	4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
5	♣	§	%	5	E	U	e	u	Ё	Ћ	Ц	х	┼	Н	т	ш
	5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
6	♠	▬	&	6	F	V	f	v	є	ќ	д	Х	к	о	Т	Ш
	6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
7	●	↨	'	7	G	W	g	w	Є	Ќ	Д	и	К	О	у	э
	7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
8	◘	↑	(	8	H	X	h	x	s	ў	е	И	╚	п	У	Э
	8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
9	○	↓	)	9	I	Y	i	y	S	Ў	Е	╣	╔	┘	ж	щ
	9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
A	◙	→	*	:	J	Z	j	z	i	ц	ф	║	╩	┌	Ж	Щ
	10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
B	♂	←	+	;	K	[	k	{	I	Ц	Ф	╗	╦	■	в	ч
	11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
C	♀	∟	,	<	L	\	l	|	ї	ю	г	╝	╠	▄	В	Ч
	12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
D	♪	↔	-	=	M	]	m	}	Ї	Ю	Г	й	═	П	ь	§
	13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
E	♫	▲	.	>	N	^	n	~	j	ъ	«	Й	╬	я	Ь	■
	14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
F	☼	▼	/	?	O	_	o	⌂	J	Ъ	»	╖	¤	▬	№	
	15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

LaserJet PC-8 (10U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	▒ 176	└ 192	╩ 208	α 224	≡ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▓ 177	┴ 193	╤ 209	ß 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	╫ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	μ 230	÷ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	· 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	¢ 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	n 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	ì 141	¥ 157	¡ 173	╜ 189	═ 205	▌ 221	φ 237	2 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	Pt 158	« 174	╛ 190	╬ 206	▐ 222	ϵ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Å 143	ƒ 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	255

LaserJet PC-869 Latin/Greek (11G)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	129	Ϊ 145	ΐ 161	▒ 177	┴ 193	Y 209	η 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	130	Ό 146	ό 162	▓ 178	┬ 194	Φ 210	θ 226	υ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	ύ 163	│ 179	├ 195	X 211	ι 227	φ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	A 164	┤ 180	─ 196	Ψ 212	κ 228	χ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	133	Ύ 149	B 165	K 181	┼ 197	Ω 213	λ 229	§ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	Ά 134	Ÿ 150	Γ 166	Λ 182	Π 198	α 214	μ 230	ψ 246
7	● 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	135	© 151	Δ 167	M 183	P 199	β 215	ν 231	··· 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	· 136	Ώ 152	E 168	N 184	╚ 200	γ 216	ξ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	¬ 137	² 153	Z 169	╣ 185	╔ 201	┘ 217	ο 233	¨ 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	¦ 138	³ 154	H 170	║ 186	╩ 202	┌ 218	π 234	ω 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	‘ 139	ά 155	½ 171	╗ 187	╦ 203	■ 219	ρ 235	ϋ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	’ 140	£ 156	Θ 172	╝ 188	╠ 204	▄ 220	σ 236	ΰ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	Έ 141	έ 157	I 173	Ξ 189	═ 205	δ 221	ς 237	ώ 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	— 142	ή 158	« 174	O 190	╬ 206	ε 222	τ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Ή 143	ί 159	» 175	┐ 191	Σ 207	▬ 223	’ 239	255

LaserJet PC-8 Danish/Norwegian (11U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	⠿ 176	└ 192	╨ 208	α 224	≡ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▒ 177	┴ 193	╤ 209	ß 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	õ 166	╢ 182	╞ 198	╓ 214	μ 230	÷ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	Õ 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	ã 169	╣ 185	╔ 201	┘ 217	Θ 233	· 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	Ã 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	ø 155	ℓ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	ʼn 172	╝ 188	╠ 204	▄ 220	∞ 236	n 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	ì 141	Ø 157	¡ 173	╜ 189	═ 205	▌ 221	ϕ 237	2 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	Ł 158	3 174	╛ 190	╬ 206	▐ 222	ϵ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Å 143	ł 159	¤ 175	┐ 191	╧ 207	▀ 223	∩ 239	255

LaserJet PC-8 Latin/Greek (12G)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	A 128	P 144	ι 160	⠿ 176	└ 192	╨ 208	ω 224	≡ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	B 129	Σ 145	κ 161	▒ 177	┴ 193	╤ 209	ά 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	Γ 130	T 146	λ 162	▓ 178	┬ 194	╥ 210	έ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	Δ 131	Y 147	μ 163	│ 179	├ 195	╙ 211	ή 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	E 132	Φ 148	ν 164	┤ 180	─ 196	╘ 212	ϊ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	Z 133	X 149	ξ 165	╡ 181	┼ 197	╒ 213	ί 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	H 134	Ψ 150	ο 166	╢ 182	╞ 198	╓ 214	ό 230	÷ 246
7	● 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	Θ 135	Ω 151	π 167	╖ 183	╟ 199	╫ 215	ύ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	I 136	α 152	ρ 168	╕ 184	╚ 200	╪ 216	ϋ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	K 137	β 153	σ 169	╣ 185	╔ 201	┘ 217	ώ 233	· 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	Λ 138	γ 154	ς 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	M 139	δ 155	τ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	N 140	ε 156	υ 172	╝ 188	╠ 204	▄ 220	∞ 236	n 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	Ξ 141	ζ 157	φ 173	╜ 189	═ 205	▌ 221	ϕ 237	2 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	O 142	η 158	χ 174	╛ 190	╬ 206	▐ 222	ϵ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Π 143	θ 159	ψ 175	┐ 191	╧ 207	▬ 223	∩ 239	255

LaserJet Macintosh (12J)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	Ä 128	ê 144	† 160	∞ 176	¿ 192	– 208	‡ 224	240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	Å 129	ë 145	° 161	± 177	¡ 193	— 209	· 225	Ò 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	Ç 130	í 146	¢ 162	≤ 178	¬ 194	“ 210	, 226	Ú 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	É 131	ì 147	£ 163	≥ 179	√ 195	” 211	„ 227	Û 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	Ñ 132	î 148	§ 164	¥ 180	ƒ 196	‘ 212	‰ 228	Ù 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	Ö 133	ï 149	• 165	µ 181	≈ 197	’ 213	Â 229	ı 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	Ü 134	ñ 150	¶ 166	∂ 182	Δ 198	÷ 214	Ê 230	ˆ 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	á 135	ó 151	ß 167	∑ 183	« 199	◊ 215	Á 231	˜ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	à 136	ò 152	® 168	∏ 184	» 200	ÿ 216	Ë 232	¯ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	â 137	ô 153	© 169	π 185	… 201	Ÿ 217	È 233	˘ 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	ä 138	ö 154	™ 170	∫ 186	202	/ 218	Í 234	˙ 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	ã 139	õ 155	´ 171	ª 187	À 203	¤ 219	Î 235	° 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	å 140	ú 156	¨ 172	º 188	Ã 204	‹ 220	Ï 236	¸ 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	ç 141	ù 157	≠ 173	Ω 189	Õ 205	› 221	Ì 237	˝ 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	é 142	û 158	Æ 174	æ 190	Œ 206	fi 222	Ó 238	˛ 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	127	è 143	ü 159	Ø 175	ø 191	œ 207	fl 223	Ô 239	ˇ 255

LaserJet ISO8859/7 Latin/Greek (12N)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	128	144	160	° 176	ΐ 192	Π 208	ΰ 224	π 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	‘ 161	± 177	Α 193	Ρ 209	α 225	ρ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	’ 162	² 178	Β 194	210	β 226	ς 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	£ 163	³ 179	Γ 195	Σ 211	γ 227	σ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	164	΄ 180	Δ 196	Τ 212	δ 228	τ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	165	΄΄ 181	Ε 197	Υ 213	ε 229	υ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	¦ 166	Ά 182	Ζ 198	Φ 214	ζ 230	φ 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	§ 167	· 183	Η 199	Χ 215	η 231	χ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	¨ 168	Έ 184	Θ 200	Ψ 216	θ 232	ψ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	© 169	Ή 185	Ι 201	Ω 217	ι 233	ω 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	170	Ί 186	Κ 202	Ϊ 218	κ 234	ϊ 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	« 171	» 187	Λ 203	Ϋ 219	λ 235	ϋ 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	¬ 172	Ό 188	Μ 204	ά 220	μ 236	ό 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	- 173	½ 189	Ν 205	έ 221	ν 237	ύ 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	174	Ύ 190	Ξ 206	ή 222	ξ 238	ώ 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▞ 127	143	159	— 175	Ώ 191	Ο 207	ί 223	ο 239	255

LaserJet USSR-GOST (12R)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	╧ 128	╒ 144	┌ 160	А 176	Р 192	а 208	р 224	Ё 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	╨ 129	╕ 145	┐ 161	Б 177	С 193	б 209	с 225	ё 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	╤ 130	╙ 146	└ 162	В 178	Т 194	в 210	т 226	↗ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	╡ 131	╘ 147	│ 163	Г 179	У 195	г 211	у 227	↖ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	╢ 132	═ 148	— 164	Д 180	Ф 196	д 212	ф 228	↙ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	╖ 133	╓ 149	╒ 165	Е 181	Х 197	е 213	х 229	↘ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	╕ 134	╔ 150	┬ 166	Ж 182	Ц 198	ж 214	ц 230	→ 246
7	● 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	╗ 135	╣ 151	┤ 167	З 183	Ч 199	з 215	ч 231	← 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	╜ 136	╩ 152	┴ 168	И 184	Ш 200	и 216	ш 232	↑ 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	╛ 137	╠ 153	├ 169	Й 185	Щ 201	й 217	щ 233	↓ 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	╘ 138	╬ 154	┼ 170	К 186	Ъ 202	к 218	ъ 234	÷ 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	╚ 139	⠿ 155	▀ 171	Л 187	Ы 203	л 219	ы 235	± 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	╔ 140	▞ 156	▄ 172	М 188	Ь 204	м 220	ь 236	№ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	╞ 141	▦ 157	▌ 173	Н 189	Э 205	н 221	э 237	¤ 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	╟ 142	╫ 158	▐ 174	О 190	Ю 206	о 222	ю 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	╒ 143	╪ 159	▬ 175	П 191	Я 207	п 223	я 239	255

LaserJet PC-850 (12U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	⠿ 176	└ 192	ð 208	Ó 224	- 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▒ 177	┴ 193	Đ 209	ß 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	▓ 178	┬ 194	Ê 210	Ô 226	‗ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	Ë 211	Ò 227	¾ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	È 212	õ 228	¶ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	Á 181	┼ 197	ı 213	Õ 229	§ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	ª 166	Â 182	ã 198	Í 214	µ 230	÷ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	º 167	À 183	Ã 199	Î 215	þ 231	¸ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	ÿ 152	¿ 168	© 184	╚ 200	Ï 216	Þ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	® 169	╣ 185	╔ 201	┘ 217	Ú 233	¨ 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Û 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	ø 155	½ 171	╗ 187	╦ 203	█ 219	Ù 235	¹ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	ý 236	³ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	ì 141	Ø 157	¡ 173	¢ 189	═ 205	¦ 221	Ý 237	² 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	× 158	« 174	¥ 190	╬ 206	Ì 222	¯ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Å 143	ƒ 159	» 175	┐ 191	¤ 207	▀ 223	´ 239	255

LaserJet Ventura International (13J)

(Excludes models in which Agfa fonts are installed.)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	‘ 96	p 112	128	144	„ 160	‰ 176	â 192	Å 208	Á 224	Œ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	“ 177	ê 193	î 209	Ã 225	œ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	” 178	ô 194	Ø 210	ã 226	¶ 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	227	† 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	228	‡ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	— 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	– 246
7	7	23	’ 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	© 168	¡ 184	à 200	Ä 216	Ò 232	248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	® 169	¿ 185	è 201	ì 217	Õ 233	a 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	™ 170	¤ 186	ò 202	Ö 218	õ 234	o 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	↵ 155	‹ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	→ 156	› 172	¥ 188	ä 204	É 220	š 236	• 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	␣ 157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	▪ 158	Û 174	ƒ 190	ö 206	ß 222	Ÿ 238	254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	127	143	□ 159	175	¢ 191	ü 207	Ô 223	ÿ 239	… 255

LaserJet ABICOMP Brazil/Portugal (13P)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	128	144	160	Ò 176	i 192	ò 208	224	240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ó 177	à 193	ó 209	225	241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Á 162	Ô 178	á 194	ô 210	226	242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	Â 163	Õ 179	â 195	õ 211	227	243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ã 164	Ö 180	ã 196	ö 212	228	244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ä 165	Œ 181	ä 197	œ 213	229	245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Ç 166	Ù 182	ç 198	ù 214	230	246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	È 167	Ú 183	è 199	ú 215	231	247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	É 168	Û 184	é 200	û 216	232	248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	Ê 169	Ü 185	ê 201	ü 217	233	249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	Ë 170	Ÿ 186	ë 202	ÿ 218	234	250
B	11	27	+ 43	; 59	K 75	Õ 91	k 107	õ 123	139	155	Ì 171	¨ 187	ì 203	ß 219	235	251
C	12	28	, 44	< 60	L 76	Ã 92	l 108	ã 124	140	156	Í 172	£ 188	í 204	ª 220	236	252
D	13	29	- 45	= 61	M 77	Ç 93	m 109	ç 125	141	157	Î 173	´ 189	î 205	º 221	237	253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	Ï 174	§ 190	ï 206	¿ 222	238	254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	127	143	159	Ñ 175	° 191	ñ 207	± 223	239	255

LaserJet PC-8 Bulgarian (13R)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	А 128	Р 144	а 160	р 176	└ 192	⠿ 208	α 224	≡ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	Б 129	С 145	б 161	с 177	┴ 193	▒ 209	ß 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	В 130	Т 146	в 162	т 178	┬ 194	▦ 210	Γ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	Г 131	У 147	г 163	у 179	├ 195	│ 211	π 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	Д 132	Ф 148	д 164	ф 180	─ 196	┤ 212	Σ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	Е 133	Х 149	е 165	х 181	┼ 197	№ 213	σ 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	Ж 134	Ц 150	ж 166	ц 182	╡ 198	§ 214	μ 230	÷ 246
7	● 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	З 135	Ч 151	з 167	ч 183	╢ 199	╗ 215	τ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	И 136	Ш 152	и 168	ш 184	╚ 200	╝ 216	Φ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	Й 137	Щ 153	й 169	щ 185	╔ 201	┘ 217	Θ 233	· 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	К 138	Ъ 154	к 170	ъ 186	╩ 202	┌ 218	Ω 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	Л 139	Ы 155	л 171	ы 187	╦ 203	█ 219	δ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	М 140	Ь 156	м 172	ь 188	╠ 204	▄ 220	∞ 236	n 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	Н 141	Э 157	н 173	э 189	═ 205	▌ 221	φ 237	2 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	О 142	Ю 158	о 174	ю 190	╬ 206	▐ 222	є 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	П 143	Я 159	п 175	я 191	╖ 207	▀ 223	∩ 239	255

LaserJet Greek Alternate 437G (14G)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	A 128	P 144	ι 160	⠿ 176	└ 192	╩ 208	ω 224	Ώ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	B 129	Σ 145	κ 161	▩ 177	┴ 193	╤ 209	ά 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	Γ 130	T 146	λ 162	▦ 178	┬ 194	╥ 210	έ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	Δ 131	Y 147	μ 163	│ 179	├ 195	╙ 211	ή 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	E 132	Φ 148	ν 164	┤ 180	─ 196	╘ 212	ϊ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	Z 133	X 149	ξ 165	╡ 181	┼ 197	╒ 213	ί 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	H 134	Ψ 150	ο 166	╢ 182	╞ 198	╓ 214	ό 230	÷ 246
7	● 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	Θ 135	Ω 151	π 167	╖ 183	╟ 199	╫ 215	ύ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	I 136	α 152	ρ 168	╕ 184	╚ 200	╪ 216	ϋ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	K 137	β 153	σ 169	╣ 185	╔ 201	┘ 217	ώ 233	£ 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	Λ 138	γ 154	ς 170	║ 186	╩ 202	┌ 218	Ά 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	M 139	δ 155	τ 171	╗ 187	╦ 203	█ 219	Έ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	N 140	ε 156	υ 172	╝ 188	╠ 204	▄ 220	Ή 236	n 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	Ξ 141	ζ 157	φ 173	╜ 189	═ 205	▌ 221	Ί 237	2 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	O 142	η 158	χ 174	╛ 190	╬ 206	▐ 222	Ό 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Π 143	θ 159	ψ 175	┐ 191	╧ 207	▀ 223	Ύ 239	255

LaserJet Ventura US (14J)

(Excludes models in which Agfa fonts are installed.)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	‘ 96	p 112	128	144	,, 160	‰ 176	192	208	224	240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	161	“ 177	193	209	225	241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	162	” 178	194	210	226	¶ 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	163	° 179	195	211	227	† 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	164	180	196	212	228	‡ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	165	181	197	213	229	— 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	166	182	198	214	230	– 246
7	7	23	’ 39	7 55	G 71	W 87	g 103	w 119	135	151	167	183	199	215	231	247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	© 168	184	200	216	232	248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	® 169	185	201	217	233	249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	TM 170	186	202	218	234	250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	↵ 155	171	187	203	219	235	251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	→ 156	172	188	204	220	236	● 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	␣ 157	173	§ 189	205	221	237	253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	▪ 158	174	190	206	222	238	254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	127	143	□ 159	175	¢ 191	207	223	239	... 255

LaserJet ABICOMP International (14P)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	128	144	160	Ò 176	i 192	ò 208	224	240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ó 177	à 193	ó 209	225	241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Á 162	Ô 178	á 194	ô 210	226	242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	Â 163	Õ 179	â 195	õ 211	227	243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ã 164	Ö 180	ã 196	ö 212	228	244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ä 165	Œ 181	ä 197	œ 213	229	245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Ç 166	Ù 182	ç 198	ù 214	230	246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	È 167	Ú 183	è 199	ú 215	231	247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	É 168	Û 184	é 200	û 216	232	248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	Ê 169	Ü 185	ê 201	ü 217	233	249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	Ë 170	Ÿ 186	ë 202	ÿ 218	234	250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	Ì 171	¨ 187	ì 203	ß 219	235	251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	Í 172	£ 188	í 204	ª 220	236	252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	Î 173	´ 189	î 205	º 221	237	253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	Ï 174	§ 190	ï 206	¿ 222	238	254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	127	143	159	Ñ 175	° 191	ñ 207	± 223	239	255

LaserJet PC Ukrainian (14R)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	А 128	Р 144	а 160	⠿ 176	└ 192	╨ 208	р 224	Ё 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	Б 129	С 145	б 161	▒ 177	┴ 193	╤ 209	с 225	ё 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	В 130	Т 146	в 162	▓ 178	┬ 194	╥ 210	т 226	Ґ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	Г 131	У 147	г 163	│ 179	├ 195	╙ 211	у 227	ґ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	Д 132	Ф 148	д 164	┤ 180	─ 196	╘ 212	ф 228	Є 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	Е 133	Х 149	е 165	╡ 181	┼ 197	╒ 213	х 229	є 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	Ж 134	Ц 150	ж 166	╢ 182	╞ 198	╓ 214	ц 230	І 246
7	● 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	З 135	Ч 151	з 167	╖ 183	╟ 199	╫ 215	ч 231	і 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	И 136	Ш 152	и 168	╕ 184	╚ 200	╪ 216	ш 232	Ї 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	Й 137	Щ 153	й 169	╣ 185	╔ 201	┘ 217	щ 233	ї 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	К 138	Ъ 154	к 170	║ 186	╩ 202	┌ 218	ъ 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	Л 139	Ы 155	л 171	╗ 187	╦ 203	█ 219	ы 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	М 140	Ь 156	м 172	╝ 188	╠ 204	▄ 220	ь 236	№ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	Н 141	Э 157	н 173	╜ 189	═ 205	▌ 221	э 237	¤ 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	О 142	Ю 158	о 174	╛ 190	╬ 206	▐ 222	ю 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	П 143	Я 159	п 175	┐ 191	╧ 207	▀ 223	я 239	255

LaserJet Pi Font (15U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1	1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
2	2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
3	3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
4	4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
5	5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
6	6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
7	7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
8	8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
9	9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
A	10	26	TM 42	58	74	90	106	122	138	154	170	186	202	218	234	250
B	11	27	SM 43	59	75	91	107	123	139	155	171	187	203	219	235	251
C	12	28	® 44	60	76	92	108	124	140	156	172	188	204	220	236	252
D	13	29	© 45	61	77	93	109	125	141	157	173	189	205	221	237	253
E	14	30	Ⓜ 46	62	78	94	110	126	142	158	174	190	206	222	238	254
F	15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

LaserJet PC-857 (16U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	⠿ 176	└ 192	º 208	Ó 224	- 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▒ 177	┴ 193	ª 209	ß 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	▓ 178	┬ 194	Ê 210	Ô 226	242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	Ë 211	Ò 227	¾ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	È 212	õ 228	¶ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	Á 181	┼ 197	213	Õ 229	§ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	Ğ 166	Â 182	ã 198	Í 214	µ 230	÷ 246
7	● 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	ğ 167	À 183	Ã 199	Î 215	231	¸ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	İ 152	¿ 168	© 184	╚ 200	Ï 216	× 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	® 169	╣ 185	╔ 201	┘ 217	Ú 233	¨ 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Û 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	ø 155	½ 171	╗ 187	╦ 203	█ 219	Ù 235	¹ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	ì 236	³ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	ı 141	Ø 157	¡ 173	¢ 189	═ 205	¦ 221	ÿ 237	² 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	Ş 158	« 174	¥ 190	╬ 206	Ì 222	¯ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Å 143	ş 159	» 175	┐ 191	¤ 207	▬ 223	´ 239	255

LaserJet PC852 (17U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p	Ç	É	á	⠿	└	đ	Ó	-
	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1	☺	◄	!	1	A	Q	a	q	ü	Ĺ	í	▒	┴	Đ	ß	˝
	1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
2	☻	↕	"	2	B	R	b	r	é	Í	ó	▓	┬	Ď	Ô	˛
	2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	Ë	Ń	ˇ
	3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
4	♦	¶	$	4	D	T	d	t	ä	ö	Ą	┤	─	ď	ń	˘
	4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
5	♣	§	%	5	E	U	e	u	ů	Ľ	ą	Á	┼	Ň	ň	§
	5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
6	♠	▬	&	6	F	V	f	v	ć	ľ	Ž	Â	Ă	Í	Š	÷
	6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
7	•	↨	'	7	G	W	g	w	ç	Ś	ž	Ě	ă	Î	š	¸
	7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
8	◘	↑	(	8	H	X	h	x	ł	ś	Ę	Ş	╚	ě	Ŕ	°
	8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
9	○	↓	)	9	I	Y	i	y	ë	Ö	ę	╣	╔	┘	Ú	¨
	9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
A	◙	→	*	:	J	Z	j	z	Ő	Ü		╢	╩	┌	ŕ	·
	10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
B	♂	←	+	;	K	[	k	{	ő	Ť	ź	╗	╦	■	Ű	ű
	11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
C	♀	∟	,	<	L	\	l	|	î	ť	Č	╝	╠	▄	ý	Ř
	12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
D	♪	↔	-	=	M	]	m	}	Ź	Ł	ş	Ż	═	Ţ	Ý	ř
	13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
E	♫	▲	.	>	N	^	n	~	Ä	×	«	ż	╬	Ů	ţ	■
	14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
F	☼	▼	/	?	O	_	o	⌂	Ć	č	»	╖	¤	▬	´	
	15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

LaserJet PC-853 Turkish/Latin 3 (18U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	⠿ 176	└ 192	208	Ó 224	- 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	ċ 145	í 161	▒ 177	┴ 193	209	ß 225	241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Ċ 146	ó 162	▓ 178	┬ 194	Ê 210	Ô 226	ℓ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	Ë 211	Ò 227	ʼn 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	È 212	Ġ 228	˘ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	Á 181	┼ 197	ı 213	ġ 229	§ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	ĉ 134	û 150	Ğ 166	Â 182	Ŝ 198	Í 214	µ 230	÷ 246
7	● 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	ğ 167	À 183	ŝ 199	Î 215	Ħ 231	¸ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	İ 152	Ĥ 168	Ş 184	╚ 200	Ï 216	ħ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	ĥ 169	╣ 185	╔ 201	┘ 217	Ú 233	¨ 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	170	║ 186	╩ 202	┌ 218	Û 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	ĝ 155	½ 171	╗ 187	╦ 203	█ 219	Ù 235	251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	Ĵ 172	╝ 188	╠ 204	▬ 220	Ŭ 236	³ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	ì 141	Ĝ 157	ş 173	Ż 189	═ 205	221	ŭ 237	² 253
E	♫ 14	▲ 30	. 46	> 62	N 78	ˆ 94	n 110	˜ 126	Ä 142	× 158	« 174	ż 190	╬ 206	Ì 222	238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Ĉ 143	ĵ 159	» 175	┐ 191	¤ 207	▬ 223	´ 239	255

LaserJet Windows 3.1 Baltic (19L)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	€ 128	144	160	° 176	Ą 192	Š 208	ą 224	š 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	‘ 145	161	± 177	ĮĮ 193	Ń 209	ĮĮ 225	ń 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	, 130	’ 146	¢ 162	² 178	Ā 194	Ņ 210	ā 226	ņ 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	“ 147	£ 163	³ 179	Ć 195	Ó 211	ć 227	ó 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	„ 132	” 148	¤ 164	´ 180	Ä 196	Ō 212	ä 228	ō 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	… 133	• 149	165	µ 181	Å 197	Õ 213	å 229	õ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	† 134	– 150	¦ 166	¶ 182	Ę 198	Ö 214	ę 230	ö 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	‡ 135	— 151	§ 167	· 183	Ē 199	× 215	ē 231	÷ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	Ø 168	ø 184	Č 200	Ų 216	č 232	ų 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	‰ 137	™ 153	© 169	¹ 185	É 201	Ł 217	é 233	ł 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	Ŗ 170	ŗ 186	Ź 202	Ś 218	ź 234	ś 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	‹ 139	› 155	« 171	» 187	Ė 203	Ū 219	ė 235	ū 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	¬ 172	¼ 188	Ģ 204	Ü 220	ģ 236	ü 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	¨ 141	¯ 157	- 173	½ 189	Ķ 205	Ż 221	ķ 237	ż 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	ˇ 142	˘ 158	® 174	¾ 190	Ī 206	Ž 222	ī 238	ž 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▩ 127	˛ 143	159	Æ 175	æ 191	Ļ 207	ß 223	ļ 239	˙ 255

LaserJet Symbol (19M) (Symbol-Set-SWM font only)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1	1	17	! 33	1 49	A 65	Θ 81	α 97	θ 113	129	145	ϒ 161	± 177	ℑ 193	∇ 209	〈 225	〉 241
2	2	18	∀ 34	2 50	B 66	P 82	β 98	ρ 114	130	146	′ 162	″ 178	ℜ 194	® 210	® 226	∫ 242
3	3	19	# 35	3 51	X 67	Σ 83	χ 99	σ 115	131	147	≤ 163	≥ 179	℘ 195	© 211	© 227	⌠ 243
4	4	20	∃ 36	4 52	Δ 68	T 84	δ 100	τ 116	132	148	⁄ 164	× 180	⊗ 196	™ 212	™ 228	⎮ 244
5	5	21	% 37	5 53	E 69	Y 85	ε 101	υ 117	133	149	∞ 165	∝ 181	⊕ 197	∏ 213	∑ 229	⌡ 245
6	6	22	& 38	6 54	Φ 70	ς 86	φ 102	ϖ 118	134	150	ƒ 166	∂ 182	∅ 198	√ 214	⎛ 230	⎞ 246
7	7	23	∋ 39	7 55	Γ 71	Ω 87	γ 103	ω 119	135	151	♣ 167	• 183	∩ 199	· 215	⎜ 231	⎟ 247
8	8	24	(40	8 56	H 72	Ξ 88	η 104	ξ 120	136	152	♦ 168	÷ 184	∪ 200	¬ 216	⎝ 232	⎠ 248
9	9	25	) 41	9 57	I 73	Ψ 89	ι 105	ψ 121	137	153	♥ 169	≠ 185	⊃ 201	∧ 217	⎡ 233	⎤ 249
A	10	26	* 42	: 58	ϑ 74	Z 90	φ 106	ζ 122	138	154	♠ 170	≡ 186	⊇ 202	∨ 218	⎢ 234	⎥ 250
B	11	27	+ 43	; 59	K 75	[91	κ 107	{ 123	139	155	↔ 171	≈ 187	⊄ 203	⇔ 219	⎣ 235	⎦ 251
C	12	28	, 44	< 60	Λ 76	∴ 92	λ 108	| 124	140	156	← 172	… 188	⊂ 204	⇐ 220	⎧ 236	⎫ 252
D	13	29	− 45	= 61	M 77	] 93	μ 109	} 125	141	157	↑ 173	| 189	⊆ 205	⇑ 221	⎨ 237	⎬ 253
E	14	30	. 46	> 62	N 78	⊥ 94	ν 110	~ 126	142	158	→ 174	— 190	∈ 206	⇒ 222	⎩ 238	⎭ 254
F	15	31	/ 47	? 63	O 79	_ 95	ο 111	127	143	159	↓ 175	↵ 191	∉ 207	⇓ 223	⎮ 239	255

LaserJet Windows Latin 1 (19U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	€ 128	144	160	° 176	À 192	Ð 208	à 224	ð 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	‘ 145	¡ 161	± 177	Á 193	Ñ 209	á 225	ñ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	, 130	’ 146	¢ 162	² 178	Â 194	Ò 210	â 226	ò 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	ƒ 131	“ 147	£ 163	³ 179	Ã 195	Ó 211	ã 227	ó 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	„ 132	” 148	¤ 164	´ 180	Ä 196	Ô 212	ä 228	ô 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	… 133	• 149	¥ 165	µ 181	Å 197	Õ 213	å 229	õ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	† 134	– 150	¦ 166	¶ 182	Æ 198	Ö 214	æ 230	ö 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	‡ 135	— 151	§ 167	· 183	Ç 199	× 215	ç 231	÷ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	ˆ 136	˜ 152	¨ 168	¸ 184	È 200	Ø 216	è 232	ø 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	‰ 137	™ 153	© 169	¹ 185	É 201	Ù 217	é 233	ù 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	Š 138	š 154	ª 170	º 186	Ê 202	Ú 218	ê 234	ú 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	‹ 139	› 155	« 171	» 187	Ë 203	Û 219	ë 235	û 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	Œ 140	œ 156	¬ 172	¼ 188	Ì 204	Ü 220	ì 236	ü 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	- 173	½ 189	Í 205	Ý 221	í 237	ý 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ž 142	ž 158	® 174	¾ 190	Î 206	Þ 222	î 238	þ 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▩ 127	143	Ÿ 159	¯ 175	¿ 191	Ï 207	ß 223	ï 239	ÿ 255

LaserJet PC-860 Portugal (20U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	▒ 176	└ 192	╨ 208	α 224	≡ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	À 145	í 161	▓ 177	┴ 193	╤ 209	ß 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	È 146	ó 162	╫ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ã 132	õ 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	Á 134	Ú 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	● 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	Ì 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	Ê 137	Õ 153	Ò 169	╣ 185	╔ 201	┘ 217	Θ 233	· 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	Í 139	¢ 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	Ô 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	n 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	ì 141	Ù 157	¡ 173	╜ 189	═ 205	▌ 221	ϕ 237	2 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ã 142	Pt 158	« 174	╛ 190	╬ 206	▐ 222	ϵ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Â 143	Ó 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	255

LaserJet PC-861 Iceland (21U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	░ 176	└ 192	╨ 208	α 224	≡ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▒ 177	┴ 193	╤ 209	ß 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	Á 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	þ 149	Í 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	Ó 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	● 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	Ý 151	Ú 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	ý 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	· 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	Ð 139	ø 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	ð 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	n 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	Þ 141	Ø 157	¡ 173	╜ 189	═ 205	▌ 221	ϕ 237	2 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	Pt 158	« 174	╛ 190	╬ 206	▐ 222	ϵ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Å 143	ƒ 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	255

LaserJet PC-863 Canada-French (23U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	¦ 160	⠿ 176	└ 192	╨ 208	α 224	≡ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	È 145	´ 161	▒ 177	┴ 193	╤ 209	ß 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Ê 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	Â 132	Ë 148	¨ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	Ï 149	¸ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	¶ 134	û 150	³ 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	● 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	¯ 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	¤ 152	Î 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ô 153	┌ 169	╣ 185	╔ 201	┘ 217	Θ 233	· 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	¢ 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	n 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	‗ 141	Ù 157	¾ 173	╜ 189	═ 205	▌ 221	φ 237	² 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	À 142	Û 158	« 174	╛ 190	╬ 206	▐ 222	ϵ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	§ 143	ƒ 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	255

LaserJet PC-8 Polish Mazovia (24Q)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	Ę 144	Ź 160	⠿ 176	└ 192	╨ 208	α 224	≡ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	ę 145	Ż 161	▒ 177	┴ 193	╤ 209	ß 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	ł 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	Ó 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ń 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	Ć 149	Ń 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	ą 134	û 150	ź 166	╢ 182	╞ 198	╓ 214	μ 230	÷ 246
7	● 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	ż 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	Ś 152	§ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	┌ 169	╣ 185	╔ 201	┘ 217	Θ 233	· 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	zł 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	Ł 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	n 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	ć 141	¥ 157	¡ 173	╜ 189	═ 205	▌ 221	ϕ 237	2 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	ś 158	« 174	╛ 190	╬ 206	▐ 222	ϵ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Ą 143	ƒ 159	» 175	┐ 191	╧ 207	▬ 223	∩ 239	255

LaserJet PC-865 Norway (25U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	⠿ 176	└ 192	╨ 208	α 224	≡ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▒ 177	┴ 193	╤ 209	ß 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	● 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	· 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	ø 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	n 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	ì 141	Ø 157	¡ 173	╜ 189	═ 205	▌ 221	ϕ 237	2 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	Pt 158	« 174	╛ 190	╬ 206	▐ 222	ϵ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Å 143	ƒ 159	¤ 175	┐ 191	╧ 207	▬ 223	∩ 239	255

LaserJet PC-775 Baltic (26U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ć 128	É 144	Ā 160	⠿ 176	└ 192	ą 208	Ó 224	- 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	Ī 161	▒ 177	┴ 193	č 209	ß 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	▓ 178	┬ 194	ę 210	Ō 226	“ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	ā 131	ō 147	Ż 163	│ 179	├ 195	ė 211	Ń 227	¾ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ż 164	┤ 180	─ 196	į 212	õ 228	¶ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	ģ 133	Ģ 149	ź 165	Ą 181	┼ 197	š 213	Õ 229	§ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	ç 150	” 166	Č 182	Ų 198	ų 214	µ 230	÷ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ć 135	Ś 151	¦ 167	Ę 183	Ū 199	ū 215	ń 231	„ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ł 136	ś 152	© 168	Ė 184	╚ 200	ž 216	Ķ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ē 137	Ö 153	® 169	╣ 185	╔ 201	┘ 217	ķ 233	· 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	Ŗ 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ļ 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ŗ 139	ø 155	½ 171	╗ 187	╦ 203	█ 219	ļ 235	1 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	ī 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	ņ 236	3 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	Ź 141	Ø 157	Ł 173	Ţ 189	═ 205	▌ 221	Ē 237	2 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	× 158	« 174	Š 190	╬ 206	▐ 222	Ņ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Å 143	¤ 159	» 175	┐ 191	Ž 207	▬ 223	’ 239	255

LaserJet PC-8 PC Nova (27Q)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	Ž 64	P 80	ž 96	p 112	Ç 128	É 144	á 160	▒ 176	└ 192	╨ 208	α 224	≡ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▓ 177	┴ 193	╤ 209	ß 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	╫ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	● 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	· 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	Š 91	k 107	š 123	ï 139	¢ 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	Đ 92	l 108	đ 124	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	n 252
D	♪ 13	↔ 29	- 45	= 61	M 77	Ć 93	m 109	ć 125	ì 141	¥ 157	¡ 173	╜ 189	═ 205	▌ 221	ϕ 237	2 253
E	♫ 14	▲ 30	. 46	> 62	N 78	Č 94	n 110	č 126	Ä 142	Pt 158	« 174	╛ 190	╬ 206	▐ 222	ϵ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Å 143	ƒ 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	255

LaserJet Windings (579L) (More Wingbats-RegularSWM font only)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1	1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
2	2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
3	3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
4	4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
5	5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
6	6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
7	7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
8	8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
9	9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
A	10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
B	11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
C	12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
D	13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
E	14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
F	15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

6.8. HP 7550A Emulation [KC-GL] (Mode 8)

The HP 7550A emulation applies only to the printers that handle A3-size paper.

The page printer emulates the Hewlett-Packard plotter model HP 7550A and uses the Kyocera Graphics Language (KC-GL). While it shares features with the HP-GL language, it is designed to provide additional features the plotter cannot give.

KC-GL uses a simple mnemonic graphic language consisting of two-letter instructions. Some typical examples are *PA* for *Plot to Absolute coordinates* and *SP* for *Select a Pen*. The KC-GL instructions are summarized at the end of this section.

To set the KC-GL for power-up emulation, send the printer the following FRPO command:

```
!R! FRPO P1, 8; EXIT;
```

The SEM (Set EMulation) 8; command temporarily switches the printer to the KC-GL emulation.

In the HP 7550A emulation the user can receive plotting status information from the printer via the RS-232C interface. Status information is not available when the parallel interface is used.

Basic

KC-GL Instruction Format

The syntax for KC-GL instructions consists of two letters followed by parameters (if any), then a terminator as shown below.

Some instructions use no parameters. For two or more parameters, they must be separated by at least one comma or space. In some cases, a plus (+) or minus (-) sign can be used as a separator. A comma or space can also be used as a separator before, after, or between instructions, and after a terminator. When a series of instructions is coded, the series should be terminated by a semicolon, but no semicolon is required between instructions in the series.

The printer executes instructions as soon as it receives them. When too many instructions are issued, the printer executes the allowed number of parameters and reports error number 2 (wrong number of parameters).

The **SM** (Symbol Mode) instruction defines the first succeeding character as a symbol character. The **DT** (Define label Terminator) instruction defines the first succeeding character as a character plot terminator.

The character plot terminator is used to terminate the **LB** (LaBel) instruction. The default terminator is the ETX character (End of Text), which uses ASCII code 3. If this terminator is inconvenient, the DT instruction enables the user to change the character plot terminator to a different character.

Parameter Formats

KC-GL parameters are specified in one of the following formats:

Integer

When not scaled, integers are valid in the range from -2^{23} to $2^{23}-1$ plotter units. Digits to the right of the decimal point are ignored. If no sign is specified, the value is assumed to be positive.

Real number (decimal)

Real numbers from -2^{23} to $2^{23}-1$ are valid. They can include up to eight digits to the right of the decimal point. If no sign is specified, the value is assumed to be positive.

Scaled real number (scaled decimal)

Real numbers from -2^{23} to $2^{23}-1$ can be used with up to eight digits to the right of the decimal point. If no sign is specified, the value is assumed to be positive. Scaled real numbers are used only with scaled user units. All KC-GL parameters that are interpreted as user units are scaled.

Character string

A combination of characters, numeric expressions, and string variables.

When coding an instruction with two or more parameters (*Examples*: PA, PR, PU, PD) remember that the parameters must be set apart by a separator.

FRPO G0 Command

The FRPO G0 command establishes various options for the KC-GL environment. The following table lists the meanings of the individual bits in the command.

Bit Position	Bit Value	Logic Value	Description
0	0	0	Plot coordinate mode A
	1	1	Plot coordinate mode B
1	0	0	Form feed in response to SP
	2	1	SP
2	0	0	Automatic plot coordinate transition
	4	1	Fixed plot coordinate
3	0	0	Normal mode
	8	1	Enhance mode
4	0	0	Landscape page orientation
	16	1	Page orientation to FRPO C1
5	0	0	Default cursor at top left
	32	1	Default cursor at bottom left

Plot Coordinates (bit 0)

This bit defines one of two plotting coordinate modes. (See the figure on next page.)

0 = Mode A
1 = Mode B

In mode A, the origin (*0, 0*) starts at bottom left. In mode B, the origin starts at the center of the page.

Response to SP Instruction (bit 1)

This bit defines the printer response to the **SP** (Select Pen) instruction.

0 = Printer feeds out a page when it receives a SP; or SP 0; instruction.
1 = Printer returns the pen to the stall from which it came, in other words, it prints *nothing* when it receives a SP; or SP 0; instruction.

Plot Coordinates

Mode A (G0, 0;)

Mode B (G0, 1;)

Automatic Plot Coordinate Mode (bit 2)

0 = Printer changes the plot coordinate from mode A to mode B when it receives a **IP** (Input P1 and P2) instruction using the negative parameter value. When the **IN** (INitialize) instruction is later given, the printer reverts to mode A.

1 = Printer remains in mode A even when the IP instruction includes a negative parameter value.

Enhance Mode (bit 3)

This bit supports the enhance mode of HP 7550A and HP 758X plotters.

0 = Normal mode (HP 7550A standard mode and HP 758X emulation mode).

1 = Enhance mode (HP 7550A enhance mode and HP 758X standard mode).

The enhance mode should be turned on when the printer uses the HP 758X mode. The enhance mode affects the KC-GL IW (Input Window), OW (Output Window), and UC (plot User-defined Character) instructions as follows:

IW : User units are used for specifying the parameters in scaling.
OW : Window outputs are made in user units in scaling.
UC : Values for the pen control, increments in x- and y-coordinates, the width and height of characters differ from the normal (non-enhance) mode as follows.

	Pen down	**Pen up**	**x/y increment**	**Char. width**	**Char. Height**
Normal mode	≥99	≤-99	-98 to +98	6 grids	16 grids
Enhance mode	≥9999	≤-9999	-9998 to +9998	48 grids	64 grids

Page Orientation (bit 4)

This bit defines page orientation.

0 = Landscape
1 = Observes the FRPO C1 value.

Default Cursor Position (bit 5)

This bit defines the cursor position for the page at power-up.

0 = Upper-left corner of the page (X_{min}, Y_{max})
1 = Lower-left corner of the page (X_{min}, Y_{min})

Pen Selection

On an actual plotter, pen thickness and color are selected by physically installing pens. On the page printer, the pen thickness is established with a Prescribe command, or by a simple front-panel operation.

Format

`!R! FRPO G`*n*`, `*xx*`; EXIT;`

Parameters

n:

pen number:
1 = pen 1
2 = pen 2
3 = pen 3
4 = pen 4
5 = pen 5
6 = pen 6
7 = pen 7
8 = pen 8

xx:

Line-width (in dots):
0 to 99 (0 - line not printed)

Positions in the plot area can be defined as plotter units or user units. These units are explained next.

Note: **Since the pen thickness is measured in the unit of dot, printing an object in the 600-dpi resolution will result in the thickness of lines being half that expected in the 300-dpi resolution. To avoid this, switch the printing resolution to 300 dpi using the FRPO N8 command or, temporarily, using the Prescribe RESL command. Alternatively, if you need to use the 600-dpi resolution, increase the pen thickness to the double.**

Reducing Data Larger Than A2

The KC-GL can print the data of paper sizes larger than A2 reducing it onto a paper size specified using the SPSZ command. Reduction of data is achieved by the FRPO J9 parameter or from the printer's control panel. See below.

Format

```
!R! FRPO J9, x; EXIT;
```

x:

data size
0 = no reduction
1 = A2
2 = A1
3 = A0
4 = B3
5 = B2
6 = B1
7 = B0

Plotter Units and User Units

Plotter Units

The plot area is subdivided into a grid with 0.025-mm steps. Each step is a plotter unit: the smallest unit of plotting motion. One millimeter corresponds to approximately 40 plotter units. In the plot area, you can specify positions in plotter units from -2^{23} to $2^{23}-1$ (in the PA instruction). When using plotter units, only integer values are valid.

User Units

The Scale instruction (**SC**) establishes a system of user units in the plot area by specifying the coordinates of two scaling points (P1 and P2). Parameters of the Scale instruction can use integer values from -2^{23} to $2^{23}-1$; any digits to the right of the decimal place will be ignored. (Plot instructions use the same range of parameter values, but digits to the right of the decimal point are valid.) If designating *0*, *0* and *1*, *1* as scaling points, all data will be real numbers between *0* and *1*.

Setting the Scaling Points

At power-up, scaling point *P1* will be in the lower left corner of the paper, the default plot position. Point *P2* is always diagonally opposite to P1. These two points define the diagonal of a rectangle, which by default is centered on the paper. P1 and P2 can be moved by an instruction which defines any rectangle, independent of the actual paper size.

The default positions of the scaling points in modes A and B are listed at the end of this section as *Coordinate Values*.

Sample KC-GL Program

The following file draws circles according to the KC-GL instructions. The result appears on the next page.

```
IN;                    ”Initialize plotter”
IP0,0,400,400;         ”P1 and P2: 1-cm square*”
SC0,1,0,1;             ”Scale: user unit = 1 cm”
SP1;                   ”Select pen 1”
PA10,19;               ”Move pen”
CI.1;PR0,-.1;          ”Draw four circles”
CI.2;PR0,-.2;
CI.4;PR0,-.4;
CI.8;PR0,-.8;
SP2;                   ”Select pen 2”
CI1.6;PR0,-1.6;        ”Draw two circles”
CI3.2;PR0,-3.2;
SP8;                   ”Select pen 8”
CI.1;PR.5,-.5;         ”Draw circle”
SP2;                   ”Select pen 2”
CS0;SI.2,.3;LBCURSOR ”Print label**”
SP;
```

* This instruction locates P1 at 0, 0 and P2 at 400, 400 in plotter units. 400 plotter units=1 cm (0.025 mm x 400).

** ETX (End of Text, character code 03) is required as a terminator.

KC-GL Sample Program

Plotter Status Information

When the RS-232C interface is used, in addition to receiving data, the plotter (page printer) can return information such as the current pen position, pen status, and error numbers. This return information applies to the following KC-GL instructions.

Instruction	Description
OA	Output Actual position and pen status
OC	Output Commanded position and pen status
OE	Output Error
OF	Output Factors
OH	Output Hard-clip limits
OI	Output Identification
OL	Output Label length
OO	Output Options
OP	Output P1 and P2
OS	Output Status
OT	Output carousel Type
OW	Output Window

All of these instructions use the same syntax and must be followed immediately by a terminator. They use no parameters.

The functions of these instructions appear on the following pages. The last ASCII character sent by the plotter (page printer) in response to the instruction is a terminator, which will be designated here by the symbol TERM. The terminator is actually a carriage return unless changed by the **ESC.M** operator.

OA [Output Actual position and pen status]

The plotter returns the x- and y-coordinates of the current pen position and indicates whether the pen is currently up or down. This information is given by ASCII-coded integers in the following format:

```
X, Y, P TERM
```

X:
x-coordinate in absolute plotter units

Y:
y-coordinate in absolute plotter units

P:
0 if the pen is up; 1 if the pen is down

OC [Output Commanded position and pen status]

The plotter returns the x- and y-coordinates and pen status for the last valid pen positioning instruction. The pen position and status are ASCII-coded in the same way as the OA instruction. Coordinate values are given in plotter units if scaling is off, or user units if scaling is on.

OE [Output Error]

The plotter returns a decimal error number for the instruction executed immediately before the OE instruction. The error code is converted to a non-negative ASCII-coded integer whose identity is given in the following table.

Error Number	Description
0	No error
1	Instruction not recognized
2	Wrong number of parameters
3	Illegal parameter
4	(Reserved)
5	Unknown character set
6	Plot position overflow
7	(Reserved)

OF [Output Factors]

This instruction returns the number of plotter units per millimeter on each coordinate axis, as follows:

```
40, 40 TERM
```

This response indicates that plotter units are equal to 0.025 mm on both the x- and y-axes. The actual number of plotter units per millimeter is approximately 40.

OH [Output Hard-clip limits]

This instruction returns the lower left and upper right limiting coordinates of the plot area, in the following format:

X_{LL}, Y_{LL}, X_{UR}, Y_{UR} TERM

LL:
lower left

UR:
upper right

OI [Output Identification]

This instruction returns a character string indicating the plotter model being emulated, as follows:

KC-GL option (FRPO G0)	Plotter model
Mode A	7550A TERM
Mode B	7596A TERM

OL [Output Label length]

This instruction returns information on the contents of the label buffer. This may be used together with the BL instruction for accessing the necessary space for the bufferred label before printing it.

```
length, characters, linefeeds, TERM
```

length:

The length of the longest line in the bufferred label in character plot cell spaces.

characters:

An integer representing the number of printing characters and spaces in the longest line of the bufferred label. A backspace is counted as –1, whereas a character with automatic backspace counts as zero.

linefeeds:

An integer representing the net number of linefeeds that will occur when the bufferred label is drawn. An inversed line feed (VT) counts as –1, and a linefeed (LF) counts as +1.

OO [Output Options]

This instruction returns eight ASCII-coded integers separated by commas. The integers indicate plotter options supported by the page printer, as follows:

OP [Output P1 and P2]

This instruction returns the coordinate values of the current scaling points P1 and P2. The coordinates are given in plotter units by ASCII-coded integers, as follows:

```
P1x, P1y, P2x, P2y TERM
```

OS [Output Status]

This instruction returns an integer from 0 to 255 giving one byte of status information, as follows:

```
status TERM
```

The following table describes the individual bits in the status byte. After powered up or an IN instruction, bit positions 3 and 4 turn on making the bit value to be 24. Bit position 3 is cleared subsequently after delivering the status.

Bit Position	Bit Value	Description
0	1	The pen is down.
1	2	P1 or P2 has been changed. This bit is cleared when actual P1 and P2 values are read via the RS-232C interface, or when the IN instruction is executed.
2	4	A digitized point is ready for output. This bit is cleared when the point is output via the RS-232C interface, or when the IN instruction is executed.
3	8	Initialized. This bit is cleared when a status byte is output via the RS-232C interface, or when the IN instruction is executed.
4	16	Ready to receive next data.
5	32	Error. This bit is cleared when an error number is output via the RS-232C interface, or when the IN instruction is executed.
6	64	SRQ was set.
7	128	(Reserved)

OT [Output carousel Type]

This instruction delivers information on the current carousel type and stall occupancy. This may be used to determine those information in a remote location.

`OT TERM`

Response

`type, map TERM`

The current carousel type and its pen map are delivered as 2 ASCII integers, each separated by comma. The type field can contain the values –1 through 4, which have the following values:

Bit value when stall is occupied	Pen stall
1	1
2	2
4	3
8	4
16	5
32	6
64	7
128	8

OW [Output Window]

This instruction returns the x- and y-coordinates of two diagonally opposite corners of the current plottable area. Four ASCII-coded integers indicating the lower left and upper right corner coordinates are returned by using the following format:

X_{LL}, Y_{LL}, X_{UR}, Y_{UR}, TERM

LL:

lower left

UR:

upper right

Device-Control Instructions

KC-GL uses device-control instructions to return buffer status information and other status information from the printer via the RS-232C interface. Status information cannot be output on the parallel interface. If device-control instructions are received via the parallel interface, they are ignored.

The device-control instructions for status output appear below.

Output Buffer Space (ESC.B)

This instruction returns 0 if the receive buffer is full, and 1024 if the receive buffer is empty.

Output Extended Error (ESC.E)

This instruction normally returns 0, if an error has not occurred, and returns 15 if a framing error, parity error, or overrun error has occurred.

Output Buffer Size Label (ESC.L)

This instruction always returns the value 1024.

Output Extended Status (ESC.O)

This instruction returns printer status information regarding:

- On-line status
- Cover open
- Paper empty
- Paper jam
- Buffer full

The following table describes this status information.

Response	Description
1	The buffer is full.
9	The buffer is empty (normal).
17	The buffer is full and the printer is off-line.
25	The buffer is empty and the printer is off-line.
33	The buffer is full with the printer under one of the following conditions: cover open, paper empty, or paper jam.
41	The buffer is empty with the printer under one of the following conditions: cover open, paper empty, or paper jam.

The paper feed source is the internal cassette at all time.

A complete list of device-control instructions appear on page 6-192.

Fonts and Symbol Sets in KC-GL

KC-GL uses a special stroke font. The bitmapped fonts employed in the other emulations cannot be used in KC-GL. The default height and width of the stroke font vary depending on the paper size.

The following character sets are available for the KC-GL emulation.

No.	Character set	ISO No.
0/10	ANSI ASCII	006
1/11	HP 9825 Character Set	–
2/12	French/German	–
3/13	Scandinavian	–
4/14	Spanish/Latin American	–
6/16	JIS ASCII	014
7/17	Roman Extensions	–
8/18	Katakana	013
9/19	ISO IRV (International Reference Version)	002
30/40	ISO Swedish	010
31/41	ISO Swedish For Names	011
32/42	ISO Norwegian Version 1	060
33/43	ISO German	021
34/44	ISO French	025
35/45	ISO United Kingdom	004
36/46	ISO Italian	015
37/47	ISO Spanish	017
38/48	ISO Portuguese	016
39/49	ISO Norwegian Version 2	061

KC-GL Symbol Sets

ANSI ASCII (0)

CODE SET 0

	20	30	40	50	60	70
0		0	@	P	`	p
1	!	1	A	Q	a	q
2	"	2	B	R	b	r
3	#	3	C	S	c	s
4	$	4	D	T	d	t
5	%	5	E	U	e	u
6	&	6	F	V	f	v
7	'	7	G	W	g	w
8	(	8	H	X	h	x
9	)	9	I	Y	i	y
A	*	:	J	Z	j	z
B	+	;	K	[	k	{
C	,	<	L	\	l	|
D	-	=	M	]	m	}
E	.	>	N	^	n	~
F	/	?	O	_	o	

Roman Extensions (7)

CODE SET 7

	20	30	40	50	60	70
0		¯	â	Å	Á	Þ
1	À		ê	î	Ã	þ
2	Â		ô	Ø	ã	
3	È	°	û	Æ	Đ	
4	Ê	Ç	á	å	đ	
5	Ë	ç	é	í	Í	
6	Î	Ñ	ó	ø	Ì	¯
7	Ï	ñ	ú	æ	Ó	¼
8	´	¡	à	Ä	Ò	½
9	`	¿	è	ì	Õ	ª
A	ˆ	¤	ò	Ö	õ	º
B	¨	£	ù	Ü	Š	«
C	˜	¥	ä	É	š	□
D	Ù	§	ë	ï	Ú	»
E	Û	ƒ	ö	ß	Ÿ	±
F	£	¢	ü	Ô	ÿ	

Katakana (8)

CODE SET 8

	20	30	40	50	60	70
0		ー	タ	ミ		
1	。	ア	チ	ム		
2	「	イ	ツ	メ		
3	」	ウ	テ	モ		
4	、	エ	ト	ヤ		
5	・	オ	ナ	ユ		
6	ヲ	カ	ニ	ヨ		
7	ァ	キ	ヌ	ラ		
8	ィ	ク	ネ	リ		
9	ゥ	ケ	ノ	ル		
A	ェ	コ	ハ	レ		
B	ォ	サ	ヒ	ロ		
C	ャ	シ	フ	ワ		
D	ュ	ス	ヘ	ン		
E	ョ	セ	ホ	゛		
F	ッ	ソ	マ	゜		

KC-GL International Characters

		23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
		35	36	64	91	92	93	94	96	123	124	125	126
0	ANSI ASCII	#	$	@	[	\	]	^	`	{	|	}	~
1	9825 Character Set	#	$	@	[	√	]	↑	`	π	⊢	→	~
2	French/German	£	$	@	[	ç	]	^	`	¨	°	¨	'
3	Scandinavian	£	$	@	Ø	Æ	ø	æ	`	¨	°	¨	°
4	Spanish/Latin American	¿	$	@	[	¡	]	^	`	~	~	~	~
6	JIS ASCII	#	$	@	[	¥	]	^	`	{	|	}	~
9	ISO IRV (International Reference Version)	#	¤	@	[	\	]	^	`	{	|	}	–
30	ISO Swedish	#	¤	@	Ä	Ö	Å	^	`	ä	ö	å	–
31	ISO Swedish For Names	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
32	ISO Norway, Version 1	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	–
33	ISO German	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
34	ISO French	£	$	à	°	ç	§	^	`	é	ù	è	¨
35	ISO United Kingdom	£	$	@	[	\	]	^	`	{	|	}	–
36	ISO Italian	£	$	§	°	ç	é	^	ù	à	ò	è	ì
37	ISO Spanish	£	$	§	¡	Ñ	¿	^	`	°	ñ	ç	~
38	ISO Portiguese	#	$	§	Ã	Ç	Õ	^	`	ã	ç	õ	°
39	ISO Norway, Version 2	§	$	@	Æ	Ø	Å	^	`	æ	ø	å	~

☐ Back Space Character

KC-GL Limits

Standard Character Sizes

Unit: cm

Paper size	Width	Height
A4	0.187	0.269
A3	0.285	0.375
Letter	0.187	0.269
Ledger	0.285	0.375

Maximum Plot Area

Paper size	X		Y	
	Plotter units	Dots	Plotter units	Dots
A4	11477	3389	7999	2362
A3	16398	4842	11487	3392
Letter	10776	3182	8236	2432
Ledger	16872	4982	10776	3182

Coordinate Values

Mode A, RO 0

Unit: plotter units

Paper size	P1x	P1y	P2x	P2y
A4	430,	200	10430,	7400
A3	380,	430	15580,	10430
Letter	80,	320	10080,	7520
Ledger	620,	80	15820,	10080

Mode A, R0 90

Unit: plotter units

Paper size	P1x	P1y	P2x	P2y
A4	200,	430	7400,	10430
A3	430,	380	10430,	15580
Letter	320,	80	7520,	10080
Ledger	80,	620	10080,	15820

Mode B, RO 0

Unit: plotter units

Paper size	P1x	P1y	P2x	P2y
A4	–4700,	–2480	4700,	2480
A3	–6680,	–4700	6680,	4700
Letter	–4348,	–2598	4348,	2598
Ledger	–6916,	–4348	6916,	4348

Mode B, RO 90

Unit: plotter units

Paper size	P1x	P1y	P2x	P2y
A4	–2480,	–4700	2480,	4700
A3	–4700,	–6680	4700,	6680
Letter	–2598,	–4348	2598,	4348
Ledger	–4348,	–6916	4348,	6916

Summary of KC-GL Instructions

[c] Character string
[d] decimal (-128.0000 to +127.9999)
[i] integer (-32768 to +32767)
[sd] scaled decimal (-32768.0000 to +32767.9999)

Instruction	Parameters	Description
AA	x-coordinate [i/sd], y-coordinate [i/sd], center-angle [i] (, resolution [i])	Arc absolute
AF	–	Advance page
AH	–	Advance page
AR	Δx [i/sd], Δy [i/sd], arc-angle [i] (, resolution [i])	Arc relative
BL	character-string [c] terminator	Buffer label
CA	character-set-no. [i]	Designate alternate character set
CI	radius [i/sd] (, resolution [i])	Circle
CP	horizontal-character-count [d], vertical-character-count [d]	Character plot
CS	character-set-no. [i]	Designate standard character set
CT	–	Chord tolerance for AA, AR, CI
DF	–	Default
DI	run [d], rise [d]	Absolute direction
DR	run [d], rise [d]	Relative direction
DT	terminator [c]	Define label terminator
EA	x-coordinate [i/sd], y-coordinate [i/sd]	Edge rectangle absolute
EP	–	Edge polygon for PM, RA, RR, WG
ER	Δx [i/sd], Δy [i/sd]	Edge rectangle relative
ES	character-space [d](, line- space [d])	Extra space for NCP
EW	radius [i/sd], start-angle [i], center-angle [i] (, resolution [i])	Edge wedge
FP	–	Fill polygon for PM, RA, RR, WG
FT	type [i] (,spacing [sd] (,angle [i]))	Fill type
IM	E-mask-value [i] (, S-mask-value [i] (,P-mask-value [i]))	Input mask
IN	–	Initialize
IP	P1x [i], P1y [i] (, P2x [i], P2y [i])	Input P1 and P2
IW	X_{LL} [i/sd], Y_{LL} [i/sd], X_{UR} [i/sd], Y_{UR} [i/sd],	Input window
LB	character-string [c]	Label

Instruction	Parameters	Description
LO	position-number [i]	Label origin
LT	pattern-no. [i] (, pattern-length [d])	Line type
OA	–	Output actual position and pen status*
OC	–	Output commanded position and pen status*
OE	–	Output error*
OF	–	Output factors*
OH	–	Output hard-clip limits*
OI	–	Output identification*
OL	–	Output label length
OO	–	Output options*
OP	–	Output P1 and P2*
OS	–	Output status byte*
OT	–	Output carousel type
OW	–	Output window*
PA	x1-coordinate [i/sd], y1-coordinate [i/sd] (,x2-coordinate [i/sd], y2-coordinate [i/sd], ..., xn-coordinate [i/sd], yn- coordinate [i/sd])	Plot absolute
PB	–	Print bufferred label
PD	x1-coordinate [i/sd], y1-coordinate [i/sd] (, ... xn-coordinate [i/sd], yn-coordinate [i/sd])	Pen down
PM	–	Polygon mode
PR	Δx1 [i/sd], Δy1 [i/sd] (,Δx2 [i/sd], Δy2 [i/sd], ..., xn-coordinate [i/sd], yn-coordinate [i/sd])	Plot relative
PS	paper-size [i]	Select paper size
PT	pen-thickness [d]	Pen thickness
PU	x1-coordinate [i/sd], y1-coordinate [i/sd] (, ... xn-coordinate [i/sd], yn-coordinate [i/sd])	Pen up
RA	x-coordinate [i/sd], y-coordinate [i/sd]	Fill rectangle absolute
RO	angle-in-degrees [i]	Rotate coordinate system
RR	Δx [i/sd], Δy [i/sd]	Fill rectangle relative
SA	–	Select alternate character set
SC	Xmin [i], Xmax [i], Ymin [i], Ymax [i],	Scale
SI	character-width [d], character-height [d]	Absolute character size
SL	tanθ [d]	Character slant
SM	character [c]	Symbol mode

Instruction	Parameters	Description
SP	pen-number [i]	Select pen
SR	character-width [d], character-height [d]	Relative character size
SS	–	Select standard character set
TL	tick-length-in-positive-direction [d] (, tick-length-in-negative-direction [d])	Tick length
UC	(pen-control [i],) Δx [i], Δy (,...) (, pen-control [i]) (,...,)	Plot user-defined character
WG	radius [i/sd], start-angle [i], center-angle [i] (, resolution [i])	Plot filled wedge
XT	–	X-tick
YT	–	Y-tick

E-Mask Bit Values

The IM instruction sets an E-mask that controls how errors are reported on the RS-232C interface. The E-mask value is the sum of the bit values in the following table.

Bit	Error No.		Description
1	0	1	Command not recognized
2	1	2	Wrong number of parameters
4	2	3	Illegal parameter
8	3	4	Unknown character
16	4	5	Unknown character set
32	5	6	Plot position overflow
64	6	7	–
128	7	8	–

S-Mask/P-Mask Values

S-Mask/P-Mask Values	Bit Value	Description
1	0	Pen down
2	1	Changed P1 or P2
4	2	Valid digitizing point
8	3	Initialized
16	4	Ready
32	5	Error
64	6	–
128	7	–

Device-Control Instructions

∗ Ignored
∗∗ Used when the RS-232C interface option is installed.

Instruction	Parameters	Description
ESC.(	–	Plotter ON*
ESC.Y	–	Plotter ON*
ESC.)	–	Plotter OFF*
ESC.Z	–	Plotter OFF*
ESC.@	[(<DEC>);(<DEC>)];	Plotter configuration*
ESC.B	–	Output buffer space
ESC.E	–	Output extended error
ESC.H	[(<DEC>);(<ASC>);(<ASC>); (;...<ASC>)]	Select handshaking mode 1*
ESC.I	[(<DEC>);(<ASC>);(<ASC>); (;...<ASC>)]	Select handshaking mode 2*
ESC.J	–	Ignore device-control instructions*
ESC.K	–	Ignore plot instructions*
ESC.L	–	Output buffer size
ESC.M	[(<DEC>);(<ASC>);(<ASC>); (<ASC>);(<ASC>);(<ASC>)]	Select output mode (output trigger character, echo terminator, output terminator)
ESC.N	[(<DEC>);(<ASC>);(;...<ASC>)]	Select extended output and handshaking mode 1*
ESC.O	–	Output extended status
ESC.R	–	Reset handshaking*

Default States (DF)

Function	Equivalent Instruction	Default Value
Plotting mode	PA;	Absolute (plotter units)
Polygon mode	PM0; PM2;	Empty polygon
Line type	LT;	Solid line
Line pattern length	LTn,4;	4% of distance between P1 and P2
Scaling	SC;	Off (plotter units used for x- and y-coordinates)
Input window	IW;	Set to hard-clip limits
Circle and arc resolution	–	5 degrees
Symbol mode	SM;	Off
Tick length	TL;	x-axis: 0.5 % of |P2y - P1y| y-axis: 0.5% of |P2x - P1x|
Mask value	IM233,0,0;	All errors recognized, but no response to service request or parallel port.
Fill type	FT;	Type 1 (bidirectional fill)
Fill spacing	FT;	1% of distance between P1 and P2 (used only in fill types 3 and 4)
Fill angle	FT;	0 degrees
Pen thickness	PT;	0.3 mm (fill spacing for fill types 1 and 2)
Label origin	–	Current pen position
Relative direction	DR1,0;	Horizontal characters
Relative size	SR;	Character width: 0.75% of |P2x - P1x| Character height: 1.5% of |P2y - P1y|
Character space	ES 0, 0;	None
Character slant	SL;	0 degrees
Label buffer	BL ETX;	None
Label terminator	DT ETX;	ETX (ASCII code 3)
Label origin	LO;	Position number
Character set	SS;	Standard character set
Standard character set	CS0;	Character set 0
Code tolerance	CT;	Angle mode of AA, AR, CI, or WG
Alternate character set	CA0;	Character set 0

Initial Conditions (IN)

Function	Equivalent instruction	Initial condition
Default conditions	DF;	Default values
Scaling points	IP;	Initialized according to paper size
Coordinate system rotation	RO;	0 degrees (default setting)

6.9. KPDL Operators

This section is a guide to the machine-dependent part of KPDL.

The KPDL operators described in this section can be used for confirming and changing the printer's internal settings. The list includes both the original KPDL operators and the KPDL Level 2 operators. For clear identification, KPDL Level 2 operators are labelled with (2).

Most of the operators in this chapter are paired: one operator for setting an environmental parameter, and another operator for confirming the setting. The setting operator starts with the letters *set*. The confirmation operator has the same name, but without the initial *set*.

Communication with the printer

The operations described below are performed by sending KPDL operators to the printer in the KPDL mode. KPDL operators can be sent either by file transfer, or interactively using communications software. This section explains both methods. As an example, it uses the KPDL operator that sets the printer to print a status page when powered on.

Example:
Operators to enable delivery of the power-up status page

```
!R! SEM 9; EXIT;          % Enter KPDL mode
serverdict begin 0 exitserver
                          % Password
statusdict begin          % Open status dictionary
true setdostartpage       % Print status page
                          % at power-up
end                       % Close status dictionary
^D                        % End of job (control-D)
```

The initial `SEM 9;` ensures that the printer is in the KPDL mode. If the printer is already in the KPDL mode, `SEM 9;` is ignored. The second line gives the printer's password, which is necessary in order to change this setting. The third line opens the printer's internal status dictionary, where operators for changing the printer's settings are located. The fourth line changes the setting so that a status page is printed upon power-up. The fifth line closes the status dictionary, and the last line ends the setting operation.

The percent signs (%) and the words to the right are comments. Comments are included only to explain the operators, and can be omitted when typing operators.

Try using one of the methods explained on the following page to enable delivery of the power-on status page. Then try switching the printer's power off, then on again. A status page will print automatically. If you do not want the printer to print out the status page every time you turn it on, you can disable this function by repeating the same operation, but changing the word `true` to `false`.

File transfer

One way to transfer a file is to place the six lines above in a file and transfer the file to the printer. The basic requirements are:

- Except for `SEM 9;` and `EXIT;` (which can be in either uppercase or lowercase letters), all operators must be typed in lowercase letters, exactly as shown.

- The file must not contain any extraneous control codes, as are frequently added by word-processing software.

- The file must be sent as a file, not printed. If you print the file, you will only obtain printed output.

In MS-DOS or PC-DOS, a simple way to meet these requirements is to create the file by copying from the console screen, then sending the file by copying it to the printer. You can use the DOS COPY command both to create the file and to send it to the printer. Type as follows (`con` means console and `status-on` is the file name). Type control-D for ^D (end-of-job), and control-Z for ^Z (end-of-file).

```
C:\>copy con status-on
!R! SEM 9; EXIT;
serverdict begin 0 exitserver
statusdict begin
true setdostartpage
end
^D
^Z
C:\>copy status-on lpt1
```

For the final `lpt1`, substitute the name of the port to which the printer is connected.

On the Macintosh, you can create the file with the TeachText program and send it to the printer with a font downloading utility program. When creating the file, omit the final control-D. This control code will be supplied by the downloading utility.

Control Key Functions

Key	Function
Control-T	Request for the printer's status.
Control-S	XOFF; instructs the printer to stop sending data to the computer. Can be used to prevent data from overflowing the screen.
Control-Q	XON; instructs the printer to resume sending data.
Control-D	End-of-file; indicates the end of a job.
Control-C	Interrupt; cancels the current job immediately.

•When not in an error status

```
%%[ status: "status"; ]%%%
```

The following character strings are returned when the printer is in one of the following statuses.

```
Self Test      %%[ status: initializing ]%%
Not Ready      %%[ status: initializing ]%%
Ready          %%[ status: idle ]%%
Processing*1   %%[ status: printing ]%%
Processing*2   %%[ status: busy ]%%
Waiting        %%[ status: waiting ]%%
FF-Timeout     %%[ status: busy ]%%
```

*1 When there are pages to be ejected
*2 When there are no pages to be ejected

•When in an error status

```
Paper Jam      %%[ staus: PrinterError :
               paper entry misfeed; source : X4 ]%%
Cover Open     %%[ staus: PrinterError :
               over open; source : X4 ]%%
no Cassette    %%[ staus: PrinterError :
               no paper tray; source : X4 ]%%
Add Paper      %%[ staus: PrinterError :
               out of paper; source : X4 ]%%
toner Low      %%[ staus: PrinterError :
               toner low (halt); source : X4 ]%%
Please Wait    %%[ staus: PrinterError :
               warming up; source : X4 ]%%
Video I/F      %%[ staus: PrinterError : video
               interface mode; source : X4 ]%%
Offline        %%[ staus: PrinterError :
               offline; source : X4 ]%%
toner low      %%[ staus: PrinterError :
               toner low (waning); source : X4 ]%%
Other Error    %%[ staus: PrinterError :
               other reason; source : X4 ]%%
```

X4: This field contains interface information.
This information applies to the interface that is being used for the current printing operation.

```
Serial I/F      serial 25
Parallel I/F    parallel
Option I/F      Option 1 (or EtherTalk1: only when
                connected to a Macintosh)
Option I/F2     Option 2 (or EtherTalk2: only when
                connected to a Macintosh)
```

If the printer's status is not idle, press the control-C or control-D key combination until the status becomes idle. Next type the word `executive` in lowercase letters. (You should not see the characters echoed on the screen.) Then press Return. The prompt `KPDL` will appear:

```
KPDL>
```

You can now enter KPDL operators. The printer will echo them back to the screen and execute them when you press Return. Enter the following line:

```
KPDL>serverdict begin 0 exitserver
%%[ exitserver: permanent state may be changed ]%%
```

The second line represents a reply from the printer indicating that the password (0) was correct. You may alter parameters in the printer's permanent configuration. The printer leaves the interactive mode at this point, therefore to continue, you must type `executive` and press Return again. When the KPDL prompt reappears, you can continue typing in the KPDL operators that set the printer to print a status page at power-up. You can also confirm that the setting has been made. The entire procedure can be carried out from the start as follows:

```
(Type control-T)
%%[ status: idle ]%%
(Type "executive" then press Return)
KPDL>serverdict begin 0 exitserver
%%[ exitserver: permanent state may be changed ]%%
(Type "executive" and press Return again)
KPDL>statusdict begin
KPDL>true setdostartpage
KPDL>dostartpage ==
true
KPDL>end
KPDL>quit
```

By typing `dostartpage ==` you ask for confirmation that the status page has been enabled. The reply `true` indicates that a status page will be printed at power-up.

The final `quit` operator exits the interactive mode, ends the setting job, and leaves the printer in the idle state.

Transferring a PRESCRIBE sequence interactively

To interactively transfer a PRESCRIBE sequence to the printer, the starting PRESCRIBE sequence, !R!, must be immediately followed by a carriage return. For example:

Correct:

```
KPDL>!R! (carriage-return)
box 1, 1;
...
exit;
```

Incorrect:

```
KPDL>!R! box 1, 1;
...
exit;
```

General form of KPDL operators

Setting operators

Setting operators start with the word `set`, as in `setdostartpage`. They change parameters stored in the printer's internal status dictionary. With one exception (`setjobtimeout`), the settings are retained after the power is switched off.

Before performing any setup operations, you must open the printer's status dictionary. Many setup operations also require that you give the printer's password. Setup operations have the following general structure:

```
serverdict begin 0 exitserver
                          % Password
statusdict begin          % Open status dictionary
      :
      :
one or more setting operators
      :
      :
end                       % Close status dictionary
^D                        % End of job
```

By giving the password you obtain the right to alter parameters in the printer's permanent configuration. The right lasts until the printer receives control-D or (in interactive mode) the word `quit`.

When you alter several parameters, the first and last two lines are necessary only once. You do not have to enter the password and open the status dictionary separately for each parameter.

The password is set to 0 when the printer is shipped. If the printer is used in an environment in which protection against unauthorized parameter alteration is necessary, the password can be changed with the `setpassword` operator.

Setting sequences can be sent to the printer either interactively, or by file transfer.

Confirmation operators

Confirmation operators such as `dostartpage` return a value that you can read by entering a double equal sign (==) after the operator. The operator pushes a value onto the stack in the printer's memory. The == pops the value from the stack and sends it to the computer.

Some operators push two or more values on the stack. These can be read by entering two or more double equal signs.

To obtain the values, enter the operator followed by a double equal sign for each value returned. Note that:

- Each double equal sign must be preceded by a space, or must be entered on a new line. Also, there should not be a space between each equal sign.

Right:
```
KPDL>dostartpage ==
true
```
Right:
```
KPDL>dostartpage
KPDL>==
true
```
Wrong:
```
KPDL>dostartpage = =
```

- A single equal sign (=) can be used instead of a double equal sign (==) to read numbers and character strings, but not to read array values. A double equal sign reads any printable value.

- If confirmation operators are sent by file transfer, the printer will execute them and no error will occur, but you will not see any reply.

- Confirmation operations are supported through the serial interface and the bi-directional interface, and not through the normal parallel interface. Generally, two-way communications (either AppleTalk or an RS-232C connection and communication software) are required.

To perform confirmation operations you must open the printer's status dictionary, but you do not have to give the password. Confirmation operations use the following general form:

```
statusdict begin          % Open status dictionary
      :
      :
one or more confirmation operations
      :
      :
end                       % Close status dictionary
```

When performing several confirmation operations, you only have to enter `statusdict begin` and `end` once at the beginning and end. Confirmation operations can also be performed during setup operations, as was done with `setdostartpage` and `dostartpage` in the interactive example given earlier.

KPDL summary

This section lists all KPDL operators, their operands, and their results.

When received from the computer, operators and operands are placed in an area in the printer's memory called the *stack*. In the operator table, each operator is preceded by its list of operands (if any). These operands must be placed onto the stack prior to the operator itself. Each operator is followed by a list of its results (if any). The results returned by the operator are also placed onto the stack.

For example, the `add` operator is listed as follows:

```
num1 num2 add sum        add num1 and num2
```

The action of this operator is to remove the two numbers that precede it from the top of the stack, add them, and put their sum onto the stack.

If an operator does not require any preceding operands or does not place any result on the stack, the corresponding column in the table is blank.

The following abbreviations (and a few others) are used for operands:

ang	angle (specified in degrees)
bool	boolean: the value true or false
dict	dictionary
int	integer
num	number (integer or real)
obj	object (any object)
pattern	pattern dictionary
proc	procedure
tag	tag
userpath	array of path construction operators and their operands
a	value pertaining to the AppleTalk interface
r	value pertaining to the RS-232C interface
p	value pertaining to the parallel interface

Note: **Certain operators are hyphenated in the following tables because of the editorial limitation only. These operators must not be hyphenated to be executed.**

KPDL page description operators

Preceding stack	Operator	Result	Description
obj	=		Write object to standard output
obj	==		Write object to standard output with syntax markings
	<< (2)	mark	Push mark object on operand stack
mark key1 value1 ...keyn valuen	>> (2)	dict	Create a dictionary containing the specified key-value pair
	[	mark	Push mark on stack
mark obj0...obj (n-1)	]	array	End array starting at topmost mark
num1	abs	num2	Get absolute value of num1
num1 num2	add	sum	Add num1 and num2
array	aload	a0...a(n-1) array	Load array elements into stack, below array
string target	anchorsearch	tail target true or string false	Test whether target is initial substring of string
int/bool1 int/bool2	and	int/bool3	Bitwise or logical AND
x y r ang1 ang2	arc		Create counterclockwise arc
x y r ang1 ang2	arcn		Create clockwise arc
x1 y1 x2 y2 r	arct (2)		Create line ending in arc
x1 y1 x2 y2 r	arcto	xt1 yt1 xt2 yt2	Create line ending in arc; return arc coordinates
int	array	array	Create array of null objects
ax ay string	ashow		Print string with adjusted character spacing
obj0...obj (n-1) array	astore	array	Pop elements from stack into array
num den	atan	angle	Get arctangent of num/den in degrees
cx cy chr ax ay string	awidthshow		Print string with ashow and widthshow effects
dict	begin		Push dict on dictionary stack
proc	bind	proc	Replace operator names in proc by values
int1 count	bitshift	int2	Shift int1 bitwise by count (positive is left)

Preceding stack	Operator	Result	Description
file	bytesavailable	int	Get number of bytes left to read in file
	cachestatus	bsize bmax msize mmax csize cmax blimit	Get font cache information
num1	ceiling	num2	Find least integer not less than num1
string bool	charpath		Create character outline
	clear		Clear entire stack
	cleardictstack		Clear dictionary stack
mark obj1...objn	cleartomark		Clear stack down through mark
	clip		Create new clipping path
	clippath		Set current path as clipping path
file	closefile		Close file
	closepath		Connect subpath to starting point
width height bits/comp matrix datasrc0 ... datasrcn-1 multi ncomp	colorimage (2)		Paint a sample image
matrix	concat		Mutiply current transform matrix by given matrix
matrix1 matrix2 matrix3	concatmatrix	matrix3	Replace matrix3 with matrix1 x matrix2
obj1...objn n	copy	obj1...objn	Duplicate top n objects on stack
dict1 dict2	copy	dict2	Copy dict1 to dict2
array1 array2	copy	subarray2	Copy array1 to initial subarray of array2
string1 string2	copy	substring2	Copy string1 to initial substring of string2
gstate1 gstate2	copy		Copy gstate1 to gstate2
	copypage		Print and retain current page
angle	cos	real	Find cosine of angle (degrees)
	count	n	Count objects on stack
	countdictstack	int	Count objects on dictionary stack
	countexecstack	int	Count objects on execution stack
mark obj1...objn	counttomark	mark obj1... obj n	Count objects on stack down to mark
proc string	cshow (2)		Show characters changing the font mapping algorithm
	currentblack-generation (2)	proc	Return the black generation function

Preceding stack	Operator	Result	Description
	currentcacheparams (2)	mark size lower upper	Return font cache parameters
	currentcmykcolor (2)	cyan magenta yellow black	Return the current color according to the cyan-magenta-yellow-black color space
	currentcolor (2)	comp1 comp2 ... comp n	Return the components of the color
	currentcolor-rendering (2)	dict	Return the value of the CIE based color rendering dictionary
	currentcolorscreen (2)	redfreq redang redproc greenfreq greenang greenproc bluefreq blueang blueproc grayfreq grayang grayproc	Return the current halftone screen parameters
	currentcolorspace (2)	array	Return the color space
	currentcolortransfer (2)	redproc greenproc blueproc grayproc	Return the current transfer functions
	currentdash	array offset	Get current dash pattern
string	currentdevparams (2)	dict	Return all parameters for device
	currentdict	dict	Push current dictionary on oper- and stack
	currentfile	file	Get file currently being executed
	currentflat	num	Get current flatness tolerance
	currentfont	font	Get current font dictionary
	currentglobal (2)	bool	Return the VM allocation mode currently in effect
	currentgray	num	Get current gray level
gstate	currentgstate (2)	gstate	Copy the current graphics state
	currenthalftone (2)	halftone	Return the current halftone dictionary
	currenthsbcolor	hue sat brt	Get current hue, saturation, and brightness
	currentlinecap	int	Get current line end type
	currentlinejoin	int	Get current corner type

Preceding stack	Operator	Result	Description
	currentlinewidth	num	Get current line width
matrix	currentmatrix	matrix	Replace matrix with current transform matrix
	currentmiterlimit	num	Get current miter length limit
	currentobjectformat (2)	int	Return the object format parameter currently in effect
	currentoverprint (2)	bool	Return the value of the overprint parameter
	currentpacking (2)	bool	Return the current array packing mode
	currentpagedevice (2)	dict	Return a device parameter on the current page
	currentpoint	x y	Get coordinates of current point
	currentrgbcolor	red green blue	Get current red/green/blue levels
	currentscreen	freq angle proc	Get current halftone screen
	currentstrokeadjust (2)	bool	Return the current stroke adjust parameter
	currentsystem-params (2)	dict	Return current values of all system parameters
	currenttransfer	proc	Get current gray transfer function
	currentundercolor-removal (2)	proc	Return the under color removal function
	currentuser params (2)	dict	Return current values of all user parameters
x1 y1 x2 y2 x3 y3	curveto		Create Bézier cubic curve from current point to (x3, y3)
num/string	cvi	int	Convert number or string to integer
obj	cvlit	obj	Convert object to literal
string	cvn	name	Convert string to name
num/string	cvr	real	Convert number or string to real
num radix string	cvrs	substring	Convert number to representation in radix
obj string	cvs	substring	Convert object to substring of string
obj	cvx	obj	Convert object to executable object
key value	def		Place key and value in current dictionary
matrix	defaultmatrix	matrix	Replace matrix with device default matrix
key font	definefont	font	Define font as a font dictionary associated with key

Preceding stack	Operator	Result	Description
key instance category	defineresource (2)	instance	Define a resource in a specified category
index any	defineuserobject (2)		Establish an user object
filename	deletefile (2)		Remove the specified file
int	dict	dict	Create dictionary with capacity for *int* entries
array	dictstack	subarray	Copy dictionary stack to array
num1 num2	div	quotient	Divide *num1* by *num2*
dx dy	dtransform	dx' dy'	Transform distance from user to device space
dx dy matrix	dtransform	dx' dy'	Transform distance by matrix
obj	dup	obj obj	Duplicate top object on stack
bool	echo		Turn interactive echoing on/off
	end		Pop dictionary stack
	eoclip		Clip using even-odd rule
	eofill		Fill using even-odd rule
any1 any2	eq	bool	Pop two objects from the stack and pushes the boolean value true if they are equal, false if not
	erasepage		Erase the current page
obj1 obj2	exch	obj2 obj1	Exchange top two objects on stack
obj	exec		Execute preceding object
form	execform (2)		Paint a form
array	execstack	subarray	Copy execution stack into array
index	execuserobject (2)		Execute the user object
array/file/string	executeonly	array/file/string	Enable execution access only
	exit		Exit innermost loop
base exponent	exp	real	Raise base to exponent
	false	false	Push boolean value false on stack
string1 string2	file	file	Open file named string1 in string2 access mode
template proc scratch	filenameforall (2)		Enumerate all files whose names match
file	fileposition (2)	position	Return the current position in a file
	fill		Fill current path with current color
src|tgt param1...paramn name	filter (2)	file	Create a filtered file
key	findencoding (2)	array	Obtain an encoding vector

Preceding stack	Operator	Result	Description
key	findfont	font	Get a font dictionary identified by key
key category	findresource (2)	instance	Obtain a named resource instance in a specified category
	flattenpath		Convert curves to piecewise linear segments
num1	floor	num2	Find greatest integer not exceeding num1
	flush		Send data in buffer to standard output
file	flushfile		Send data in buffer to output file, or read and discard rest of input file
	FontDirectory	dict	Push directory of font dictionaries on stack
init incr limit proc	for		Execute *proc* for *init* to *limit* in steps of *incr*
array proc	forall		Do proc for each array element
dict proc	forall		Do proc for each element of dict
string proc	forall		Do proc for each element of string
any	gcheck (2)	bool	Return residence mode of any
num/string1 num/string2	ge	bool	Test whether num/string1 is greater than or equal to num/string2
array index	get	obj	Get array element at index location
dict key	get	obj	Get value associated with key in dictionary
string index	get	int	Get string element at index location
string index count	getinterval	substring	Get substring. Index and count are starting location and length of substring
array index count	getinterval	subarray	Get subarray. Index and count are starting element and length of subarray
	globaldict (2)	dict	Create a new dictionary object
	GlobalFontDirectory (2)	dict	Push a dictionary of defined font
name	glyphshow (2)		Show a single character
	grestore		Restore saved graphics state
	grestoreall		Restore to bottommost graphics state
	gsave		Save graphics state
	gstate (2)	gstate	Create a new graphics state object

Preceding stack	Operator	Result	Description
num/string1 num/string2	gt	bool	Test whether num/string1 > num/string2
matrix	identmatrix	matrix	Replace matrix with identity transform
int1 int2	idiv	quotient	Divide *int1* by *int2*; integer quotient
dx' dy'	idtransform	dx dy	Transform distance from device to user space
dx' dy' matrix	idtransform	dx dy	Transform distance by inverse of matrix
bool proc	if		Do *proc* if *bool* is true
bool proc1 proc2	ifelse		Do *proc1* if *bool* is true; otherwise do *proc2*
dict	image		Print bit-mapped image
wd ht bits matrix proc	image		
dict	imagemask		Print binary mask
wd ht invt matrix proc	imagemask		
objn...obj0 n	index	objn...obj0 objn	Copy n-th object to top of stack
x y userpath	ineofill (2) ineofill	bool	Test the current path on the even-odd rule for insideness
x y userpath	infill (2) infill	bool	Test the current path for insideness
	initclip		Initialize clipping path
	initgraphics		Reset graphics state parameters
	initmatrix		Initialize current transfer matrix
x y userpath	instroke (2) instroke	bool	Test pixels in the current path for insideness
x y userpath userpath1 userpath2	inueofill (2) inueofill	bool	Test the user path on the even-odd rule for insideness
x y userpath userpath1 userpath2	inufill (2) inufill	bool	Test the user path for insideness
x y userpath x y userpath matrix userpath1 userpath2 userpath1 userpath2 matrix	inustroke (2) inustroke inustroke inustroke	bool	Test pixels in the user path for insideness
matrix1 matrix2	invertmatrix	matrix2	Replace matrix2 with inverse of matrix1
	ISOLatin1Encoding (2)	array	Push the ISO Latin-1 encoding vector
x' y'	itransform	x y	Transform coordinates from device to user space

Preceding stack	Operator	Result	Description
x' y' matrix	itransform	x y	Transform coordinates by inverse of matrix
dict key	known	bool	Test whether key is in dictionary
proc string	kshow		Print string, executing proc between characters
	languagelevel (2)	int	Return the language level
num/string1 num/string2	le	bool	Test whether num/string1 is less than or equal to num/string2
array	length	int	Get number of elements in array
dict	length	int	Get number of key-value pairs in dict
string	length	int	Get length of string
name	length	int	Get length of name
x y	lineto		Create line from current point to (x, y)
num	ln	real	Get natural logarithm
key	load	value	Search dictionary stack for key and return value
num	log	real	Get logarithm
proc	loop		Do proc until exit is encountered
num/string1 num/string2	lt	bool	Test whether num/string1 < num/string2
font matrix	makefont	font'	Generate new font by matrix transformation
dict matrix	makepattern (2)	pattern	Create an instance from a prototype pattern
	mark	mark	Push mark on stack
	matrix	matrix	Create identity matrix
dict	maxlength	int	Get capacity of dict
int1 int2	mod	remainder	Find int1 module int2 (integers)
x y	moveto		Move current point to (x, y)
num1 num2	mul	product	Multiply num1 by num2
obj1 obj2	ne	bool	Test whether obj1 is not equal to obj2
num1	neg	num2	Get negative of num1
	newpath		Initialize current path to null path
array/dict/file/string	noaccess	array/dict/file/ string	Disable all access
int/bool1	not	int/bool2	Bitwise or logical not
	null	null	Push null on operand stack
	nulldevice		Install no-output device

Preceding stack	Operator	Result	Description
int/bool1 int/bool2	or	int/bool3	Bitwise or logical OR
obj0...objn-1 n	packedarray (2)	packedarray	Create a packed array
	pathbbox	llx lly urx ury	Get bounding box of current path
move line curve close	pathforall		Do named procedures for current path elements
obj	pop		Discard top object on stack
string	print		Write string to standard output
obj tag	printobject (2)		Write a binary object sequence to the standard output
	product (2)	string	Get product name
	prompt		Prompt for interactive input
	pstack		Write entire stack to standard out put
array index object	put		Insert object int array at index location
dict key value	put		Place key and value in dictionary
string index int	put		Replace character in string at index location
array1 index array2	putinterval		Replace subarray of *array1* starting at *index* by *array2*
string1 index string2	putinterval		Replace substring of *string1* starting at *index* by *string2*
	quit		Terminate KPDL interpreter
	rand	int	Generate pseudo-random integer
array/dict/file/string	rcheck	bool	Test if object is read-accessible
dx1 dy1 dx2 dy2 dx3 dy3	rcurveto		Create Bézier cubic curve to relative point
file	read	int true or false	Read one character from file; return false if end of file
file string	readhexstring	substring bool	Read hexadecimal characters from file into string
file string	readline	substring bool	Read line from file into string; return true if filled
array/dict/file/string	readonly	array/dict/file/ string	Enable read access only
file string	readstring	substring bool	Convert file of hexadecimal character codes into character string; return true if string is filled
	realtime (2)	int	Return the real time clock value

Preceding stack	Operator	Result	Description
x y width height numarray/numstring	rectclip (2) rectclip		Clip with a rectangular path
x y width height numarray/numstring	rectfill (2) rectfill		Fill with a rectangular path
x y width height x y width height matrix numarray numarray matrix numstring numstring matrix	rectstroke (2) rectstroke rectstroke rectstroke rectstroke rectstroke		Stroke with a rectangular path
old new	renamefile (2)		Change the name of a file
int proc	repeat		Do proc int times
file	resetfile		Clear buffer for file
template proc scratch category	resourceforall (2)		Enumerate all instances of a specified resource category
key category	resourcestatus (2)	status size true (false)	Return status information about a named resource instance
save	restore		Restore saved virtual memory
	reversepath		Reverse direction of current path printer's software
	revision (2)	int	Get product revision
dx dy	rlineto		Create line from current point to relative point
dx dy	rmoveto		Move current point by relative amount
ob(n-1)...ob0 n i	roll	ob(i-1)..ob0 ob(n01)..obi	Roll top n objects on stack by *i* (mod *n*)
	rootfont (2)	font	Return a root composite dictionary
angle matrix	rotate	matrix	Rotate matrix transformation by angle (degrees)
angle	rotate		Rotate user space by angle (degrees)
num1	round	num2	Round off num1 to nearest integer
	rrand	int	Get random number seed
string	run		Execute file
	save	save	Save virtual memory
sx sy matrix	scale	matrix	Define scaling matrix
sx sy	scale		Scale user space
font scale	scalefont	font'	Generate new font by scaling old font
any	scheck (2)	bool	Same as gcheck

Preceding stack	Operator	Result	Description
string target	search	post match head true or string false	Search for target substring in string
key scale	selectfont (2)		Select a font and establish the font dictionary
	serialnumber (2)	int	Return the serial number to represent the machine
llx lly urx ury	setbbox (2)		Establish a bounding box for the current path
proc	setblackgeneration (2)		Set the black generation function parameter
wx wy llx lly urx ury	setcachedevice		Declare width and bounds of cached character
w0x w0y llx lly urx ury w1x w1y vx vy	setcachedevice2 (2)		Declare width and bounds of cached character
num	setcachelimit		Declare maximum byte size of cached character
mark size lower upper	setcacheparams (2)		Set the font cache parameters
wx wy	setcharwidth		Declare width and bounds of uncached character
cyan magenta yellow black	setcmykcolor (2)		Set the color space to Device CMYK
comp1 comp2 ... comp n	setcolor (2)		Set the current color parameter
dict	setcolorrendering (2)		Establish a CIE-based color rendering dictionary
redfreq redang redproc greenfreq greenang greenproc bluefreq blueang blueproc grayfreq grayang grayproc	setcolorscreen (2)		Set the halftone parameter
array (name)	setcolorspace (2)		Specify a color space
redproc greenproc blueproc grayproc	setcolortransfer (2)		Set the transfer function parameter
array offset	setdash		Set dash pattern for lines
string dict	setdevparams (2)		Set parameters for I/O device
file position	setfileposition (2)		Reposition a file
num	setflat		Set flatness tolerance (smoothness of curves)
font	setfont		Set current font dictionary
bool	setglobal (2)		Set the VM allocation mode

Preceding stack	Operator	Result	Description
num	setgray		Set gray level from 0 (black) to 1 (white)
gstate	setgstate (2)		Replace the current graphics state
halftone	sethalftone (2)		Establish a halftone dictionary
hue sat brt	sethsbcolor		Set hue, saturation, and brightness (converted to gray)
int	setlinecap		Set butt (0), round (1), or square (2) line ends
int	setlinejoin		Set miter (0), round (1), or bevel (2) corner type
num	setlinewidth		Set line width
matrix	setmatrix		Replace current transform matrix with given matrix
num	setmiterlimit		Set miter length limit
int	setobjectformat (2)		Establish the number representation
bool	setoverprint (2)		Set the overprint parameter
bool	setpacking (2)		Set the array packing mode
dict	setpagedevice (2)		Install a page output device
pattern	setpattern (2)		Establish the specified pattern as the current color
red green blue	setrgbcolor		Set red/green/blue levels (converted to gray level)
freq angle proc	setscreen		Set halftone screen
bool	setshared (2)		Same as setglobal
bool	setstrokeadjust (2)		Set the stroke adjust parameter
dict	setsystemparams (2)		Set the system parameters for interpreter
proc	settransfer		Set mapping from user gray scale to device gray scale
mark blimit	setucacheparams (2)		Set user path cache parameters
proc	setundercolor-removal (2)		Set the under color removal function parameter
dict	setuserparams (2)		Set user parameters for each context
int	setvmthreshold (2)		Set the allocation threshold used to trigger garbage collector
	shareddict (2)	dict	Same as globaldict
	SharedFontDirectory (2)	dict	Same as GlobalFontDirectory
string	show		Print string on page

Preceding stack	Operator	Result	Description
	showpage		Print and reset current page
angle	sin	real	Find *sin* of angle (in degrees)
num	sqrt	real	Find square root of number
int	srand		Set random number seed
	stack		Write entire stack to standard output as text
	StandardEncoding	array	Push standard character code/name array on stack
	start		Make KPDL interpreter ready
bool passwd	startjob (2)	bool	Start a new job with condition
file	status	bool	Test if file is open
	statusdict	dict	Push statusdict on operand stack
	stop		Terminate procedure executed by stopped operator
obj	stopped	bool	Execute object. Return true if stop operator is executed in object, false if object completes normally
key value	store		Replace topmost definition of key
int	string	string	Create *string* of length *int*
string	stringwidth	wx wy	Get width of string in current font
	stroke		Draw line along current path
	strokepath		Compute outline of path
num1 num2	sub	difference	Subtract num2 from num1
	systemdict	dict	Push systemdict on operand stack
file	token	token true or false	Read and interpret token in file; return false if file is empty
string	token	tail token true or false	Read and interpret token in string return false if string is empty
x y	transform	x' y'	Transform coordinates from user to device space
x y matrix	transform	x' y'	Transform coordinates by matrix
tx ty	translate		Translate user space
tx ty matrix	translate	matrix	Define translation matrix
	true	true	Push boolean value true on stack
num1	truncate	num2	Discard fraction part of num1
obj	type	name	Get name identifying type of object
userpath	uappend (2)		Append the user path to the current path
	ucache (2)		Declare to cache the user path

Preceding stack	Operator	Result	Description
	ucachestatus (2)	mark bsize bmax rsize rmax blimit	Return user path cache parameters
userpath	ueofill (2)		Fill a user path using the evenodd rule
userpath	ufill (2)		Interprets a user path to fill
dict key	undef (2)		Remove key and value from dictionary
key	undefinefont (2)		Remove a font definition
key category	undefineresource (2)		Remove the named resource
index	undefineuserobject (2)		Undefine an user object
bool	upath (2)	userpath	Create a user path equivalent to the current path
	userdict	dict	Push userdict on operand stack
	UserObjects (2)	array	Return the current user object array
	usertime	int	Return time in milliseconds
userpath userpath matrix	ustroke (2) ustroke		Draw a line along a user path
userpath userpath matrix	ustrokepath (2) ustrokepath		Compute outline of a user path
	version	string	Return version of KPDL interpreter
int	vmreclaim (2)		Control the garbage collector
	vmstatus	level used maximum	Return virtual memory status: current save nesting depth, bytes used, and maximum byte size
array/dict/file/string	wcheck	bool	Test if object is write-accessible
key	where	dict true or false	Find dictionary in which key is defined
cx cy char string	widthshow		Print string with adjusted spacing for specified character
file int	write		Write one character to file
file string	writehexstring		Convert string into file of hexadecimal character codes
file obj tag	writeobject (2)		Write a binary object sequence to file
file string	writestring		Write string characters to file
obj	xcheck	bool	Test if object is executable
int/bool1 int/bool2	xor	int/bool3	Bitwise or logical exclusive OR
string numarray	xshow (2)		Print characters with x displacement

Preceding stack	Operator	Result	Description
string numarray	xyshow (2)		Print characters with x/y displacements
string numarray	yshow (2)		Print characters with y displacement

KPDL status operators

The operations in the table below can be used when the status dictionary is open. Some also require a password.

Preceding stack	Operator	Result	Description
	buildtime (2)	int	Identify the build of the interpreter
	byteorder (2)	bool	Get the native order in binary encoded tokens (true: low-order byte first, false: high-order byte first)
int (string)	checkpassword	bool	Check printer's password (true: valid password, false: invalid password)
	defaulttimeouts	job manual wait	Get timeout values
	diskonline	bool	Check disk online (true: disk unit online, false: disk unit offline)
	diskstatus	free total	Report total disk space and free space
	dostartpage	bool	See whether printer is set to print status page at power-up (true: output status, false: do not output)
	dosysstart	bool	See whether Sys/Start file is executed at power-up (true: execute Sys/Start, false: do nothing)
pages action	initializedisk		Format all writeable disks
	jobname	string	Get current job name
	jobtimeout	int	Get number of seconds to job timeout (0: never)
	manualfeed	bool	Test whether printer is in manual-feed mode (true: manual feed on, false: manual feed off)
	manualfeedtimeout	int	Get manual-feed time-out value
	margins	top left	Get top and left calibration margins
	newsheet		Feed out the single side printed page in duplex mode
	pagecount	int	Get number of pages printed so far (nonresettable)
	pagestackorder	bool	Get current stack tray (true: face down, false: face up)
	papersize	name bool	Get current paper size and orientation
string	printername	substring	Get printer name
	product	string	Get printer type
	ramsize	int	Check available RAM size

Preceding stack	Operator	Result	Description
	realformat	string	Get native representation for real numbers in binary tokens
	revision	int	Get KPDL revision number
[integer ... integer]	setcollatorstacker		Set sorter to collator mode
job manual wait	setdefaulttimeouts		Set timeout values.
bool	setdoprinterrors		Set error-printing mode (true: print errors, false: do nothing)
int	setdoret		Set KIR level
bool	setdostartpage		Select whether to print status page at power-up (true: output power-on status, false: do not output)
bool	setdosysstart		Set Sys/Start file reading mode at power-up (true: execute Sys/Start, false: do nothing)
int	setjobtimeout		Set time-out value of current job
[integer ... integer]	setmailboxstacker		Set sorter to mailbox mode
top left	setmargins		Set top and left calibration margins
int	setmultirayid		Set mail box identifier
bool	setpagestackorder		Set stack tray (true: face down, false: face up)
old new	setpassword	bool	Set printer's password
string	setprintername		Assign string as printer name
[integer ... integer]	setsorterstacker		Set sorter to sorting mode
int	setuserdiskpercent		Adjust disk size for use with KPDL
	waittimeout	int	Get wait time-out value
	a3		Set imageable area to A3 size. See KPDL Printable Area. This operator is in userdict.
	b4		Set imageable area to B4 size. See KPDL Printable Area. This operator is in userdict.
	a4		Set imageable area to A4 size. See KPDL Printable Area. This operator is in userdict.
	a4small		Set imageable area to small A4 size. See KPDL Printable Area. This operator is in userdict.
	b5		Set imageable area to B5 size. See KPDL Printable Area. This operator is in userdict.

Preceding stack	Operator	Result	Description
	dlenvelope (110 x 220 envelope)		Set imageable area to International DL size. See KPDL Printable Area. This operator is in userdict.
	11x17		Set imageable area to 11 x 17 (Ledger) size. See KPDL Printable Area. This operator is in userdict.
	legal		Set imageable area to legal size. See KPDL Printable Area. This operator is in userdict.
	letter		Set imageable area to letter size. See KPDL Printable Area. This operator is in userdict.
	lettersmall		Set imageable area to small letter size. See KPDL Printable Area. This operator is in userdict.
	executivepage		Set imageable area to executive size. See KPDL Printable Area. This operator is in userdict.
	com10envelope (4.125 x 9.5 envelope)		Set imageable area to Commercial 10 envelope size. See KPDL Printable Area. This operator is in userdict.
	monarcenvelope (3.875 x 7.5 envelope)		Set imageable area to Monarch envelope size. See KPDL Printable Area. This operator is in userdict.
	com6envelope		Set imageable area to Commercial 6 envelope size. See KPDL Printable Area. This operator is in userdict.
	com9envelope (3.75 x 8.875 envelope)		Set imageable area to Commercial 9 envelope size. See KPDL Printable Area. This operator is in userdict.
	a5		Set imageable area to A5 size. See KPDL Printable Area. This operator is in userdict.
	a6		Set imageable area to A6 size. See KPDL Printable Area. This operator is in userdict.
	b6		Set imageable area to B6 size. See KPDL Printable Area. This operator is in userdict.
	b5envelope		Set imageable area to ISO B5 size. See KPDL Printable Area. This operator is in userdict.
	c4envelope		Set imageable area to c4 envelope size. See KPDL Printable Area. This operator is in userdict.

Preceding stack	Operator	Result	Description
	c5envelope		Set imageable area to International C5 envelope size. See KPDL Printable Area. This operator is in userdict.
	custom		Set imageable area to custom size. See KPDL Printable Area. This operator is in userdict.
	postcard		Set imageable area to postcard size. See KPDL Printable Area. This operator is in userdict.
	doublepostcard		Set imageable area to double postcard size. See KPDL Printable Area. This operator is in userdict.
bool	setdefaultduplexmode		Select whether or not to print in duplex mode as default. (true: duplex, false: simplex)
	defaultduplexmode	bool	Get default duplex mode setting (true: duplex, false: simplex)
bool	setduplexmode		Set/cancel duplex mode. (true: duplex, false: simplex)
	duplexmode	bool	Get current setting of duplex mode. (true: duplex, false: simplex)
bool	setdefaulttumble		Set duplex printing tumble mode for binding on short side (true) or long side (false) of page.
	defaulttumble	bool	Get the default tumble mode setting. (true: short-edge bind, false: long-edge bind)
bool	settumble		Set tumble mode. (true: short-edge bind, false: long-edge bind)
	tumble	bool	Get current tumble mode setting. (true: short-edge bind, false: long-edge bind)
	firstside	bool	During duplex printing, returns whether the current print side is the front or back. During simplex printing, returns whether the current page is even or odd. (true: front or odd page, false: back or even page)

Preceding stack	Operator	Result	Description
int	setdefaultpapertray		Set the default paper tray. • FS-7000+, 9000 *0*: tray 1 *1*: tray 2 *2*: envelope feeder *3*: MP tray *4*: No *5*: tray 3 *6*: tray 4 *7*: tray 5 *8*: tray 6 • FS1750, 3950, 1200, 6300, 6900, 5900C and subsequent models *0*: tray 1 *1*: tray 2 *2*: envelope feeder *3*: MP tray *4*: tray 3 • Other than the above models *0*: tray 1 *1*: tray 2 *2*: envelope feeder *3*: tray 3 *4*: MP tray *5*: tray 4 *6*: tray 5 *7*: tray 6
	defaultpapertray	int	Get current default paper tray.
int	setpapertray		Set current paper tray.
	papertray	int	Get current paper tray.
int	setpapertray2		Select a tray by converting the tray number that is currently specified by the Prescribe tray number into a KPDL tray number. (Supported by the FS-3750 and subsequent models.)
	papertray2	int	Convert the current tray number into a Prescribe tray number. (Supported by the FS-3750 and subsequent models.) Prescribe tray numbers *0*: MP tray *1*: tray 1 *2*: tray 1 *3*: tray 1 *4*: tray 1 *5*: tray 1 *6*: tray 1 *99*: EF-1/UF-1

Preceding stack	Operator	Result	Description
bool	setdefaulttrayswitch		Set the default paper tray switch. (true: Autocass, false: Autocass off)
	defaulttrayswitch	bool	Get default paper tray switch. (true: Autocass, false: Autocass off)
bool	settrayswitch		Set the current paper tray switch. (true: Autocass, false: Autocass off)
	trayswitch	bool	Get the current paper tray switch. (true: Autocass, false: Autocass off)
	a4tray		Find tray containing A4 size paper, select it as current tray, and set imageable area for A4 size paper.
	a5tray		Find tray containing A5 size paper, select it as current tray, and set imageable area for A5 size paper.
	a6tray		Find tray containing A6 size paper, select it as current tray, and set imageable area for A6 size paper.
	b5tray		Find tray containing B5 size paper, select it as current tray, and set imageable area for B5 size paper.
	b6tray		Find tray containing B6 size paper, select it as current tray, and set imageable area for B6 size paper.
	legaltray		Find tray containing legal size paper, select it as current tray, and set imageable area for legal size paper.
	lettertray		Find tray containing letter size paper, select it as current tray, and set imageable area for letter size paper.
	executivetray		Find tray containing executive size paper, select it as current tray, and set imageable area for executive size paper.
	c4envelopetray		Find tray containing International C4 envelopes, select it as current tray, and set imageable area for International C4 envelopes.
	c5envelopetray		Find tray containing International C5 envelopes, select it as current tray, and set imageable area for International C5 envelopes.
	com10envelopetray		Find tray containing commercial #10 envelopes, select it as current tray, and set imageable area for commercial #10 envelopes.

Preceding stack	Operator	Result	Description
	com6envelopetray		Find tray containing commercial #6 envelopes, select it as current tray, and set imageable area for commercial #6 envelopes.
	com9envelopetray		Find tray containing commercial #9 envelopes, select it as current tray, and set imageable area for commercial #9 envelopes.
	dlenvelopetray		Find tray containing DL size envelopes, select it as current tray, and set imageable area for DL size envelopes.
	monarcenvelopetray		Find tray containing Monarch size envelopes, select it as current tray, and set imageable area for Monarch size envelopes.
	a3tray		Find tray containing A3 size paper, select it as current tray, and set imageable area for A3 size paper.
	b4tray		Find tray containing B4 size paper, select it as current tray, and set imageable area for B4 size paper.
	ledgertray		Find tray containing ledger size paper, select it as current tray, and set imageable area for ledger size paper.
	b5envelopetray		Find tray containing ISO B5 size paper, select it as current tray, and set imageable area for ISO B5 size paper.
	doublepostcardtray		Find tray containing double postcard size paper, select it as current tray and set imageable area for double postcard size paper.
	postcardtray		Find tray containing postcard size paper, select it as current tray, and set imageable area for postcard size paper.
	customtray		Find tray containing custom size paper, select it as current tray, and set imageable area for custom size paper.
int	setdefaultoutputtray		Set the default output tray. *0*: Upper tray (face down tray) *1*: Lower tray (face up tray) *2*: Option tray (sorter, etc.)

Preceding stack	Operator	Result	Description
	defaultoutputtray	int	Get the default output tray.
int	setoutputtray		Set the current output tray.
	outputtray	int	Get the current output tray.
	appletalktype	string	Get string object designating type of printer's AppleTalk name according to the AppleTalk Name Binding Protocol.
	doprinterrors	bool	Get setting of error information printout mode. (true: error print mode on, false: error print mode off)
bool	setdoautocontinue		Set whether to display messages on front panel and wait for ONLINE key input when an error occurs. (true: do nothing, false: display error messages)
	doautocontinue	bool	Get setting of doautocontinue mode. (true: continue processing during errors, false: halt processing when ON LINE key is pressed)
	dojamrecovery	bool	Get setting of dojamrecovery mode. (true: perform jam recovery, false: do not perform jam recovery)
	usertime	int	Get time elapsed since beginning of job processing.
	#copies	int	Get integer objected indicating current number of copies setting. This operator is in userdict.

KPDL system parameters

Preceding stack	Parameter	Result	Description
	BuildTime	int	Timestamp for printer's date of manufacture
	ByteOrder	bool	Byte order of binary encoded tokens. (true: low-order byte first, false: high-order byte first)
	CurDisplayList*	int	Indicate in bytes the memory block size used for storing *DisplayList* for the current page.
	CurFontCache*	int	Indicate in bytes the memory size used by the current font cache.
	CurFormCache*	int	Indicate in bytes the memory size used by the current form cache.
	CurOutlineCache*	int	Indicate in bytes the cache size used by *CharString* on the current harddisk.
	CurPatternCache*	int	Indicate in bytes the memory size used by the current pattern cache.
	CurScreenStorage*	int	Indicate in bytes the memory size used by the current screen.
	CurSourceList*	int	Indicate in bytes the host buffer size used by the current input device.
	CurUPathCache*	int	Indicate in bytes the memory size used by the current user path cache.
	DoAutoContinue	bool	Turn on/off the front panel display when a KPDL error occurs. (true: error display off, false: error display on)
	DoPrintErrors	bool	Turn on/off error printing when a KPDL error occurs. (true: error print on, false: error print off)
	DoStartPage	bool	Indicate whether or not to print status at power on as a bool object. (true: print status, false: do not print status)

* Read only

Preceding stack	Parameter	Result	Description
	FactoryDefaults	bool	Indicate with a boolean object whether to initialize the following parameters at power on. (true: initialize, false: do not initialize [factory default]) *SystemParamsPassword* *StartJobPassword* *FactoryDefaults* *MaxFontCache* *MaxDisplayList* *MaxScreenStorage* *MaxUPathCache* *MaxPatternCache* *MaxOutlineCache* *MaxFormCache* *FontResourceDir* *GenericResourceDir* *GenericResourcePathSep*
	FontResourceDir	string	Identify the font resource directory on the harddisk. Defaults are in (fonts/).
	GenericResourceDir	string	Identify the directory for resources other than fonts on the harddisk. Defaults are in (Resource/).
	GenericResource-PathSep	string	Specify the separator character used between resource identifiers on the harddisk. Defaults are in (/).
	JobTimeout	int	Indicate the default job timeout value.
	MaxDisplayList	int	Indicate the maximum storage of *DisplayList* for the current page.
	MaxFontCache	int	Indicate the maximum storage of the font cache.
	MaxFormCache	int	Indicate the maximum storage of the form cache.
	MaxOutlineCache	int	Indicate the maximum storage of the *CharString* cache on the disk.
	MaxPatternCache	int	Indicate the maximum storage of the pattern cache.
	MaxScreenStorage	int	Indicate in bytes the maximum storage of the half-tone screen usable by the screen.
	MaxSourceList	int	Indicate in bytes the maximum storage of the host buffer used by the current input device.

Preceding stack	Parameter	Result	Description
	MaxUPathCache	int	Indicate in bytes the maximum storage which can be used by the user path cache.
	PageCount	int	Indicate the total number of printed pages since the printer's manufacture.
	Password	int, string	Indicate the password necessary when changing system parameters and/or device parameters.
	PrinterName	string	Indicate the name given to the printer.
	RamSize	int	Indicate in bytes the total RAM capacity currently in the printer.
	RealFormat	string	Indicate the method of representing the numeric values of binary tokens.
	Revision	int	Indicate the interpreter's revision number.
	StartJobPassword	int, string	Indicate the password for *ExitServer* and *StartJob*.
	StartupMode	int	Indicate by numeric value whether to execute the (Sys/Start) file on the harddisk when first booting KPDL after power on. (0: default, 1: use Sys/Start)
	SystemParams-Password	int, string	Indicate the password for changing system parameters.
	WaitTimeout		Indicate the default wait timeout value.
	MaxImageBuffer	int	Limit the working area for processing a single image.
	MaxStoredFontCache	int	Limit the maximum font cache value stored on the disk.
	CurStoredFontCache	int	Return in bytes the font cache value found on the current disk.

KPDL user parameters

Preceding stack	Parameter	Result	Description
	AccurateScreens	bool	Turn on/off the accurate mode flag for the *setscreen* operator. (true: detail screen on, false: default)
	JobName	string	Return the name of the job currently being processed by the printer.
	JobTimeout	int	Return the current job timeout value.
	MaxDictStack	int	Indicate the maximum size of the dictionary stack.
	MaxExecStack	int	Indicate the maximum size of the execution stack.
	MaxFontItem	int	Indicate the maximum number of bytes used by a pixel array for a single character in the font cache.
	MaxFormItem	int	Indicate the maximum number of bytes used by the form of a single cached form.
	MaxLocalVM	int	Indicate the maximum number of bytes of the local VM.
	MaxOpStack	int	Indicate the maximum size of the operand stack.
	MaxPatternItem	int	Indicate the maximum number of bytes used by the form of a single cached pattern.
	MaxScreenItem	int	Indicate the maximum number of bytes used by a single half-tone screen.
	MaxUPathItem	int	Indicate the maximum number of bytes used by a single cached user path.
	MinFontCompress	int	Indicate the threshold value for storing characters in the font cache not as complete pixel arrays but in compressed form.
	VMReclaim	int	Indicate the automatic garbage collection mode.
	VMThreshold	int	Indicate the threshold at which automatic garbage collection is executed once this number of bytes has been allocated after garbage collection.
	WaitTimeout	int	Return the current wait timeout value.

KPDL page device parameters

Preceding stack	Parameter	Result	Description
	BeginPage	array	Indicate *BeginPage* procedure operations. This parameter is called together with the number of times *showpage* has executed since the beginning of the page. (default: {pop})
	Duplex	bool	Return as a boolean object the current duplex mode. (true: duplex, false: simplex)
	EndPage	array	Indicate *EndPage* procedure operations. This parameter is called together with the number of times *showpage* has executed since the end of the page. (default: {exch pop 2 ne})
	ExitJamRecovery	bool	Return as a boolean value whether to perform recovery when a paper jam occurs. (Read only) [true]
	HWResolution	array	Indicate the resolution of the physical device. (300dpi: [300 300], 600dpi: [600 600], 1200dpi: [1200 1200])
	ImagingBBox	array	Specify any bounding box for the entire page. (default: null)
	InputAttributes	dict	Indicate the dictionary associated with a currently available input device (paper tray) using the number assigned to each.
	Install	array	Execute the procedure for installing values during graphics mode when calling the setpagedevice operator.
	ManualFeed	bool	Set whether to perform manual feed. (true: MF on)
	ManualFeedTimeout	int	Return the manual feed timeout. (Read only) [0]
	Margins	array	Set the printer margins. (default: [0 0])
	MediaColor	string	Use this parameter along with */PageSize*, */MediaWeight*, and */MediaType* when the user selects a tray.
	MediaType(1)	string	Use this parameter along with */PageSize*, */MediaWeight*, and */MediaColor* when the user selects a tray.

(1)MediaType

The media types that can be used differ according to the printer.

Specified character string	Selected type
(Plain)	Plain
(Transparency)	Transparency
(Preprinted)	Preprinted
(Labels)	Labels
(Bond)	Bond
(Recycled)	Recycled
(Vellum)	Vellum
(Rough)	Rough
(Letterhead)	LetterHead
(Color)	Color
(Prepunched)	Prepunched
(Envelope)	Envelope
(Card Stock)	Cardstock
(CoatedPaper)	Coated*
(Duplex)	2 nd Size*
(Custom Type1)	Custom 1
(Custom Type2)	Custom 2
(Custom Type3)	Custom 3
(Custom Type4)	Custom 4
(Custom Type5)	Custom 5
(Custom Type6)	Custom 6
(Custom Type7)	Custom 7
(Custom Type8)	Custom 8

* Types marked with an asterisk are supported only by the FS-5900C.

Preceding stack	Parameter	Result	Description
	MediaWeight	int	Use this parameter along with */PageSize*, */MediaType*, and */MediaColor* when the user selects a tray.
	NumCopies	int	Set the current copy count. Normally null; when null is specified here, "#copies" in "userdict" takes precedence.
	OutputAttributes	dict	Indicate the dictionary containing media output entries available for the current output device (printer output tray, sorter, etc.).
	OutputFaceUp	bool	Set the printer's output stack. (true: face up, false: face down)
	OutputType	string	Indicate parameters set by the user when selecting the output stack. See example below.
	PageSize	array	Use this parameter along with */MediaColor*, */MediaWeight*, and */MediaType* when the user selects a tray. Refer to "KPDL Printable Area." (Ex: [612 792] LETTER, [595 842] A4)
	Policies	dict	Execute the policies function. This is checked when the device cannot satisfy the user-specified *setpagedevice*.
	PostRendering-Enhance	bool	Turn on/off KIR mode. (true: KIR on, false: KIR off)

Example:

Printer stack: `<</OutputType (PRINTER_STACK)>>`

SO-6, SO-30: `<</OutputType (SORTER)>>`

DF-30, DF-31: `<</OutputType (STAPLER)>>`

ST-30, ST-20: `<</OutputType (STACKER)>>`

Preceding stack	Parameters	Result	Description
	PostRendering-EnhanceDetails	dict	Set the dictionary representing the KIR mode when *PostRenderingEnhance* is true.
	SorterDetails	dict	Set the dictionary object for current sorter status information. *(1)
	TraySwitch	bool	Set the current auto cassette (mode status) using a boolean value. (true: Autocass, false: Autocass off)
	Tumble	bool	Set the current tumble mode using a boolean value. (true: shortedge, false: longedge)
	DeferredMedia-Selection	bool	Define using a boolean object the processing when the page size selected during page setup differs from the paper size of the tray. (true: display cassette error)
	ProcessColorModel	name	Return the engine type as a name object. /Device Gray: Monochrome /Device CMY: Three colors /Device CMYK: Four colors
	MediaPosition	int	Set the tray corresponding to the specified number as the current tray.
	OutputPage	bool	Set whether to output paper. (true: default, false: no output paper)
	Collate	bool	Turn on/off the collate function. (true: electric collate on (only when harddisk is installed))
	CollateDetails	dict	Control the detailed parameters of the collate function. *(2)
	Jog	int	Jog the output every n pages as given by the integer code. *0*: Do not jog *3*: Jog using the given jog offset (only when optional stacker is installed)
	Staple	int	Staple the output every n pages as given by the integer code. *0*: Do not staple *3*: Staple when job is finished
	StapleDetails	dict	Control the detailed parameters of the staple function. *(3)

*(1) SorterDetails

```
<< /SorterDetails << /SorterTray array /SorterMode string >> >> setpagedevice
```

Tray arrangement
Ex.: [ ]: All trays
[1 2]: Tray 1, 2

Sorter operation mode
Ex.: (SORTER): Sorter
(COLLATOR): Collator
(MAILBOX): Mailbox

*(2) CollateDetails: Controls the MPS (electronic sort) mode when "/Collate" is true.

Ex: `<< /Collate true /CollateDetails << /Mode int /Barcode int /BarcodePosition int /Share int /Name string /User string /Time string /Destination array >> >> setpagedevice`

Key	Type	Meaning	Parameters	default	Attribute
/Mode	integer	Job mode	*0*: HP Mopier mode *1*: Volatile job *2*: Nonvolatile job *8*: VirtualMailbox job	0	read/write
/Barcode	integer	Barcode output	*0*: Output on first page *1*: Output on all pages *2*: Do not output	2	read/write
/BarcodePosition	integer	Barcode printing position (when viewed in portrait orientation)	*0*: Lower right (bar only) *1*: Lower right perpendicular (bar only) *2*: Upper right perpendicular (bar only) *3*: Upper right (bar only) *4*: Upper left (bar only) *5*: Upper left perpendicular (bar only) *6*: Lower left perpendicular (bar only) *7*: Lower left (bar only) *128*: Lower right (bar + ID) *129*: Lower right perpendicular (bar + ID) *130*: Upper right perpendicular (bar + ID) *131*: Upper right (bar + ID) *132*: Upper left (bar + ID) *133*: Upper left perpendicular (bar + ID) *134*: Lower left perpendicular (bar + ID) *135*: Lower left (bar + ID)	0	read/write
/Share	integer	Share flag *1*: Not shared	*0*: Shared	0	read/write
/Name	string	Job name	Character string up to 31 bytes maximum	()	read/write
/User	string	User name	Character string up to 31 bytes maximum	()	read/write
/Time	string	Time stamp	Character string up to 31 bytes maximum	()	read/write
/Destination	array	VMB destination	—	[]	read/write

Refer to the following format when using VMB:

```
<< /Collate true /CollateDetails << /Mode 8 /Destination [(User 1)]>>
setpagedevice
```

*(3) StapleDetails: Controls the stapling operation when "/Staple" is set to "3."

Ex: `<< /Staple 3 /StapleDetails << /StaplePosition 3 /Count 20 >>`
`>> setpagedevice`

Key	Type	Meaning	Parameters	default	Attribute
/StaplePosition	integer	Staple position	*1*: One location at front *2*: One location in corner *3*: Two locations in center	2	read/write
/Count	integer	Staple count	*0*: Do not staple if more than 20 pages *-1*: Staple only excess if more than 20 pages *2*: Staple every 2 pages *3*: Staple every 3 pages *4*: Staple every 4 pages *5*: Staple every 5 pages ... *20*: Staple every 20 pages	0	read/write

Page Device Parameters (continued)

Preceding stack	Parameters	Result	Description
	/EconoMode	bool	Controls Econoprint mode. true: Econoprint on false: Econoprint off
	/PreRenderingEnhance	bool	Controls resolution enhancement. When "/HWResolution" is set to "600dpi." true: Fast 1200dpi false: 600dpi

Color Printer Only

Preceding stack	Parameters	Result	Description
	/DeviceRenderingVividInfo	dict	Controls "vivid color" mode. Ex: << /DeviceRenderingVividInfo << /VividColor bool >> >> setpagedevice bool true: Vivid mode on false: Vivid mode off
	/DeviceRenderingRGBInfo	dict	Controls RGB emulation. Ex: << /DeviceRenderingRGBInfo << /VirtualColorDevice << /ColorTransform name >> >> >> setpagedevice name /NTSC /AppleRGB /Trinitron /sRGB /SMPTE240M << /DeviceRenderingRGBInfo null >> setpagedevice RGB emulation is not performed.
	/DeviceRenderingCMYKInfo	dict	Controls ink simulation. Ex: << /DeviceRenderingCMYKInfo << /VirtualColorDevice << /ColorTransform name >> >> >> setpagedevice name /Normal: Normal ink simulation << /DeviceRenderingCMYKInfo null >> setpagedevice Does not perform ink simulation. Refer to the pages that follow for details.

Error messages/Printable area

KPDL Error Messages

Depending on the setting of the *doautocontinue* parameter, the printer displays errors occurring during operation in the KPDL mode as follows.

```
KPDL Error ##
.. Press ON LINE
```

Any of the following error codes will appear if errors occur and *doautocontinue* is set to false. When *doautocontinue* is set to true, only error codes 00 and 98 are available. These error codes are also reported from the printer to the computer. Some software will display these error names on the computer screen.

Code	Error	Meaning
00		Cannot initiate KPDL
01	dictfull	Dictionary full; no new entries can be added
02	dictstackoverflow	Too many begins
03	dictstackunderflow	Too many ends
04	execstackoverflow	Execution stack nesting depth exceeded 250
05	handle	Name of error-reporting procedure
06	interrupt	Control-C was received
07	invalidaccess	Attempted violation of access attribute
08	invalidexit	Exit not enclosed in any loop
09	invalidfile	Invalid access string for file operator
10	invalidfont	Invalid font name or invalid font dictionary format
11	invalidrestore	Restore would destroy composite object created after save
12	ioerror	Input/output error
13	limitcheck	Path too complex, more than 6 files open, etc.
14	nocurrentpoint	No current point is defined
15	rangecheck	Operand out of allowed range
16	stackoverflow	Operand stack overflow
17	stackunderflow	Operand stack underflow
18	syntaxerror	Syntax error in program
19	timeout	Time limit exceeded
20	typecheck	Wrong type of operand

21	undefined	Name not found in dictionary
22	undefinedfilename	File cannot be found
23	undefinedresult	Overflow, underflow, or meaningless result
24	unmatchedmark	Expected mark not found on stack
25	unregister	Internal error
26	vmerror	Virtual memory is exhausted, or illegal access was attempted
27	badpassword	Bad password
28	invalidnumber	Invalid number
29	nomemory	Memory unavailable
30	configurationerror	*Setpagedevice* request cannot be satisfied
31	invalidcontext	Improper use of context operation
32	invalidid	Invalid identifier for external object
33	undefinedresource	Resource instance not found
98	fatal	Fatal error (User memory exhausted)

KPDL Printable Area

This printer does not quite print to the edges of the paper. The edge limits of the printable area vary depending on the paper type as determined by the paper type KPDL operator. The edge limits are located as shown in the following figure and table. They adjust automatically to the size of the paper cassette (although not to the size of manually fed paper).

Paper type	Paper size		Edge limits (A)				Printable area (B)	
			Horizontal		Vertical			
	cm	Points	cm	Pt.	cm	Pt.	cm	Pt.
A3*[1]	29.7 x 42.0	842 x 1191	0.42	12	0.35	10	28.85 x 41.31	818 x 1171
B4*[1]	25.7 x 36.4	728 x 1032	0.42	12	0.35	10	24.83 x 35.70	704 x 1012
A4	21.0 x 29.7	595 x 842	0.42	12	0.35	10	20.14 x 28.99	571 x 822
A4 Small	21.0 x 29.7	595 x 842	0.875	25	0.875	25	19.22 x 27.94	545 x 792
A5	14.8 x 21.0	421 x 595	0.42	12	0.35	10	14 x 20.28	397 x 575
A6	10.5 x 14.8	297 x 421	0.42	12	0.35	10	9.63 x 14.14	273 x 401
B5	18.2 x 25.7	516 x 729	0.74	21	0.35	10	16.72 x 25.01	474 x 709
B6	12.8 x 18.2	364 x 516	0.42	12	0.35	10	11.99 x 17.49	340 x 496
Int'l DL	11.0 x 22.0	312 x 624	0.42	12	0.35	10	10.16 x 21.3	288 x 604
Int'l B5	17.6 x 25.0	499 x 708	0.42	12	0.42	12	16.75 x 24.13	475 x 684
Int'l C4*[1]	22.9 x 32.4	649 x 919	0.42	12	0.35	10	22.0 x 31.7	625 x 899
Int'l C5	16.2 x 22.9	459 x 649	0.42	12	0.35	10	15.34 x 22.18	435 x 629
Double-postcard	14.8 x 20.0	(A01*[2]) 421 x 595	0.42	12	0.49	14	14.00 x 20.00	397 x 567
		(A03 ~ *[3]) 420 x 567	0.35	10	0.35	10	14.11 x 19.30	400 x 547
Postcard	10 x 14.8	(A01*[2]) 297 x 421	0.46	13	0.35	10	9.56 x 14.14	271 x 401
		(A03 ~ *[3]) 283 x 420	0.35	10	0.35	10	9.28 x 14.11	263 x 400

Paper type	Paper size		Edge limits (A)				Printable area (B)	
			Horizontal		Vertical			
	Inches	Points	Inch.	Pt.	Inch.	Pt.	Inches	Pt.
Ledger*[1]	11 x 17	792 x 1224	0.16	12	0.11	8	10.68 x 16.78	768 x 1208
Legal	8.5 x 14	612 x 1008	0.16	12	0.11	8	8.18 x 13.78	588 x 992
Letter	8.5 x 11	612 x 792	0.16	12	0.11	8	8.18 x 10.78	588 x 776
Ltr Small	8.5 x 11	612 x 792	0.35	25	0.35	25	7.8 x 10.3	562 x 742
Executive	7.25 x 10.5	522 x 756	0.16	12	0.11	8	6.93 x 10.28	498 x 740
Com. #10	4.125 x 9.5	297 x 684	0.16	12	0.11	8	3.79 x 9.28	273 x 668
Monarch	3.875 x 7.5	279 x 540	0.16	12	0.11	8	3.555 x 7.28	255 x 524
Com. #6	3.625 x 6.5	261 x 468	0.16	12	0.11	8	3.29 x 6.28	237 x 452
Com. #9	3.875 x 8.875	279 x 639	0.16	12	0.11	8	3.54 x 8.666	255 x 623
Custom*[1]	11.7 x 17.7	842 x 1274	0.11	8	0.11	8	11.47 x 17.47	826 x 1258

*[1] For models supporting A3 size paper handling
*[2] A4 models FS-1700 and later
*[3] A3 models FS-7000 and later

Note: **The tables above represent the figures used for KPDL Level 2 which slightly differ from those for KPDL Level 1.**

6.10. Increasing Raster Image Compression Efficiency

The 600-dpi printer models including FS-6500 utilize a compression method for raster images that brings about the most efficient use of memory. Before the printer places the PCL or Prescribe raster image in VRAM, it first compresses the image using either a loss-less or lossy format. If it finds that it cannot compress the data at 50%, the printer abandons attempts to perform a loss-less compression. Instead, lossy compression takes over using a compression efficiency of 25%. Under lossy compression, some very minor distortions may appear. For this reason, the user should arrange the raster data in such a manner that loss-less compression can succeed. Suggestions for successful compression follow:

- Each raster image should be sent as a single band. If it is not possible to send the image as one band, then make each band as large as possible to reduce the number of total bands. Bands should be consecutive, starting at the top and continuing down the page.

- The height of a single image (the area from start raster to end raster) should be a multiple of 32 — multiples of 16 or 4 are alternatives if 32 does not work. This method will prove effective for rotating images.

- Avoid using non-raster commands in the middle of a consecutive sequence of raster images. In this respect, avoid using some of the following commands: pattern setting, print model setting, coordinate changes, clip setting, cursor movement, line and polygon drawing, and text printing.

- Image division can occur with compression. It is important to avoid the following situations: issuing a start raster command, placing 32 lines of empty space in the vertical direction, not using a multiple of 8 when using a horizontal pixel shift between the current image and the preceding one.

- Raster images should be sent to the printer as rectangular images. This method preserves the right edge of the image while increasing memory efficiency.

- Selection of particular print models will effect memory efficiency. In particular, a print model with an opaque source or pattern will reduce memory efficiency while transparent sources and patterns which do not overlap will not reduce efficiency.

- Images should be created as wide as possible. With a large number of divisions, characterized by long thin vertical images as a series of separate parts, memory efficiency will significantly decrease.

Chapter 7

Prescribe Commands for MPS Management

"MPS" is an abbreviation for "Multiple Printing System," which is a postprocessing function that combines an electronic sorting function, a job allocation function, stapling function, and bar code printing function. Printing can be performed faster when printing multiple copies of a document, because the data is transferred from the computer to the printer only for the first copy; the data is then stored on the printer's hard disk. This capability now allows you to print faster with higher quality, and at less cost than on a photocopier. Furthermore, printing data that is stored on the hard disk can be called up by scanning a bar code, allowing you to quickly print up additional copies of a document through the printer at any time, without needing to start up the entire computer system.

In order to take advantage of the MPS, several printer options are required, such as the hard disk and the document finisher. (→ Refer to Table 2 on page 7-4.)

- Electronic sorting — This function allows you to print multiple copies faster.
- Job allocation — This function automatically allocates jobs.
- Stapling — This function automatically staples documents printed from data that was electronically sorted.
- Bar code printing — This function uses bar codes to manage data saved on the hard disk.

7.1. MPS

1. Electronic Sorting

The electronic sorting function allows you to print multiple copies of a document while only requiring the data to be transferred to the printer once. This approach reduces the amount of time that it takes to print multiple copies. With a conventional page printer, the printer must repeat rasterization processing for each copy of a document that it wants to print each time that it receives printing data from the host computer. For example, when printing five copies of a five-page document, a conventional page printer has to rasterization processing for 5 × 5 = 25 pages.

With the MPS electronic sorting function, the host computer only needs to send the printing data for the document (a 5-page document in the example shown in figure below) to the printer once. The printer then stores the rasterized printing data on its internal hard disk. As a result, the remaining four copies (20 pages in total in the example shown in figure below) can be printed much more quickly.

2. MPS Jobs

This section uses the term “job” to refer to the task of printing a document. There are three types of jobs in MPS.

• HP Mopier-compatible jobs

When printing, the data is stored on the hard disk temporarily. After printing, the data is deleted from the hard disk. The document cannot be printed again after it has been printed.

• Temporarily stored jobs

After printing, the data is stored on the hard disk and can be used to print the document again. If the storage capacity for temporarily stored jobs becomes full, jobs on the job list are deleted, starting from the oldest jobs first. (The order of the jobs on the job list is the order in which they were accessed.)

• Stored jobs

After printing, the data is stored on the hard disk and can be used to print the document again. Even if the storage capacity for stored jobs becomes full, these jobs are not automatically deleted. Instead, they are processed as HP Mopier-compatible jobs.

The storage capacity for temporarily stored jobs and stored jobs can be set through the JOBP command (see page 2-147). The default settings for the storage areas are shown in Table 1.

Table 1 Hard Disk and Storage Area Default Settings

	Default setting	
	Temporarily stored job area	**Stored job area**
Hard disk (HD-1/HD-2)	300 MB	100 MB

3. MPS Commands

Table 2 lists the commands that are used in MPS. A ● indicates an option that is required in order to use that command.

Table 2 Commands Used by MPS

Command name	Function	Hard disk	Corresponding options		Page
			DF-30/DF-31	ST-30	
CDSK	Optimize hard disk	●	–	–	7-15
FRPO S8	Select job allocation	–	●	●	7-19
FRPO S9	Select serial interface mode	●	–	–	7-16
JOBD	Delete a job from hard disk	●	–	–	7-13
JOBL	Print stored job list	●	–	–	7-12
JOBO	Reprint a job from hard disk	●	–	–	7-11
JOBP	Settings for reprinting Storage area settings for stored jobs and temporarily stored jobs	●	–	–	7-9
JOBS	Start job	–	–	–	7-5
JOBT	End job	–	–	–	7-8
JOG	Allocate job	–	●	●	7-19
STPC	Set staple counter	–	●	–	7-17
STPL	Staple	–	●	–	7-17

7.2. Job Management System Commands

1. Starting a Job

Description

The job starts when this command is encountered.

Format

Command	**JOBS <mode>,<copy>,<barcode>,<BCRD mode> [,<share>,<name>, <user>,<time>];**
<Mode>	Save mode, 0: HP mopier compatible, 1: Temporary, 2: Permanent
<Copy>	Repeat count: 1 – 999
<Barcode>	0: On cover page only 1: On whole pages 2: None
<BCRD Mode>	Position of barcode, 0 through 7
<Share>	Share flag 0: Shared 1: Non-shared (0 if omitted)
<Name>	Job name (31 bytes maximum, null if omitted)
<User>	User name (31 bytes maximum, null if omitted)
<Time>	Time stamp (31 bytes maximum, null if omitted)
Behavior	This command determines the start of a job. In sort mode, the subsequent document is spooled in the harddisk.

Example

```
!R!JOBS 0,25,0,0,0,
   ”MPS-TEST”,
   ”T. Nakayama”,
   ”97/07/29”;
EXIT;
```

The above prints 25 copies of the job named “MPS-TEST”, “T. Nakayama,” “97/07/29” in HP5Si mode.

Remarks

- This command was provided to start the sort function.
- Electronic sort becomes possible in emulations other than PJL and KPDL.
- This command must be used in conjunction with JOBT.

Notes

- “JOBS” means “JOB Start.”
- This command also works in a system without the harddisk (e.g. using the staple function with DF-30).
- A command sequence starts with JOBS and ends with JOBT.
- If the commands between JOBS and JOBT are nested and not properly paired, the inner most JOBS ... JOBT command sequence is executed.
- If the JOBS statement is not followed by a JOBT command but a JOBS command, the page image cached in the harddisk (if installed) or the job information generated by the first JOBS command is discarded, and a new job is generated by a subsequent JOBS command sequence.
- If the first parameter specifies the temporary cache mode and the third parameter does not specifies a barcode output, the job is spooled in the harddisk but it is not printed by using the barcode.
- If the size of the permanent jobs saved in the harddisk has reached the maximum limit while the first parameter specifies the permanent job saving mode (See below.), the printer indicates an error denoting that the permanent job saving is full. The printer forcibly uses the HP5Si-compatible mode.

No more permanent jobs storable in disk	HARDDISK error 97 Press CONTINUE

- The following restrictions apply to the JOBS command in connection with other commands:

1. JOG

JOG is ignored if it is placed between JOBS and JOBT. It is valid only until the first page is delivered.

2. STPL

Stapling is possible only with an individual print job. STPL is triggered by JOBT, therefore, it is not possible to staple each of two jobs split from one job.

Barcode positions

2. Terminate a Job

Description

This command terminates a job. Executing this command transmits the data one time from the repeat data count.

Format

Command	Parameter
JOBT;	None

Example

```
!R! JOBS 0,420,2,0;
    TEXT "MPS-TEST";
    PAGE;
    TEXT "MPS-TEST2";
    PAGE;
    JOBT;
EXIT;
```

The above sorts and prints the job in 420 copies.

Notes

- This command prints the job in the number of copies specified in the cyclic manner.
- This command works in a system without the harddisk installed.
- JOBT should be used in combination with JOBS to constitute a JOBS ... JOBT sequence.
- If JOBT is issued without a preceding JOBS, settings made by JOBP are cancelled and no print process is done.
- JOBT does not cause a page break.
- If the commands between JOBS and JOBT are nested and not properly paired, the inner most JOBS ... JOBT command sequence is valid and executed.
- This command triggers jobs including stapling, job separation, offset (if the relevant option device is installed).
- The information pertaining to the job are stored in the harddisk (if installed).
- The printer prints the job in the number of copies as specified by the repeat count commanded by JOBS or JOBP.

Restriction

This command must be used with JOBS.

3. Job Output Parameter Setting

Description

This command adds various optional behaviors to the system.

Format

Command	**JOBP <Output Option>,<Parameter>;**
<Output Option>	**<Parameter>**
0: Repeat count	1 – 999
1: Printing barcode	0: First-page only 1: Whole page 2: None
2: Duplex printing	0: Off 1: Long edge binding 2: Short edge binding

3: Destination stack	1: Face-down 2: Face-up 3: Option tray
4: Stapling	0: Off 1: Bottom left, angled 2: Top left, automatic angled or upright 3: Two centered
5: Barcode position	0 through 7
6: Staple counter	M or m: Staple the maximum number of sheets that can be stapled (DF-30/DF-31: 20 sheets). 0: Do not staple jobs that exceed the maximum number of sheets that can be stapled (M). –1: Staple only the sheets that exceed the maximum number of sheets that can be stapled (M). 2 to 20: Staple the number of specified sheets.
16: Job offset	0: Off 1: On
64: Temporary job limit	0 through 99 in units of 100 MB; default is 3.
65: Permanent job limit	0 through 99 in units of 100 MB; default is 1.

Example

```
!R! JOBP 1,2;EXIT;
!R! JOBP 0,15;EXIT;
!R! JOBO ”VG5000210”;EXIT;
```

The last line above prints the job identified by ‘VG5000210’ without printing a barcode on each page.

Notes

- The parameters for this command supplements those functionalities that are not covered by JOBS and JOBT.
- Settings of item numbers 2, 3, 4, and 16 above are valid only when this command is used for JOBO. For example, the command sequence “JOBP 2,1;” will not activate duplex printing if the job is started by JOBS. (The duplex printing must be activated manually on the front panel or using DUPX, instead.)
- A JOBP setting is cancelled if the interface is switched from one to another after the interface time-out time period.

4. Job Output Command

Description

Specifying the ID and other options to this command finds and prints the job which is saved in the harddisk.

Format

Command	Parameters		Remarks
JOBO <ID>;	<ID>	Job ID	This command must be issued with an ID specified. The job is read from harddisk and printed with the optional settings specified. If the ID does not exist or the job is corrupted in harddisk, an error is messaged on the front panel display. The job ID should be a character string. Specifying the cover page ID prints the whole pages; specifying an ID on a single page prints the page only.

Example

```
!R! JOBP 0,764; JOBP 1,2;
    JOBO ”ABCD12345”;
EXIT;
```

The above example prints the job with the ID “ABCD12345” in the harddisk, with no barcode printed, in 764 copies.

Notes

- If the harddisk is not detected, an error is messaged on the front panel message display.

Remarks

- Settings such as the number of pages to print, whether to print barcode on the output, etc. must be made by JOBP followed by a JOBO.
- The serial interface should be switched to the "Barcode" mode from the front panel, or FRPO S9 (Serial barcode mode) should be set to 1. This should be confirmed by turning printer power off then on. Failure to switching the serial interface mode makes JOBO inoperable with the BC-1 barcode reader.

Errors

Two errors are issued in the following conditions:

The job does not exist.	HARDDISK error 99 Press CONTINUE
The job is corrupted.	HARDDISK error 98 Press CONTINUE

5. Job List

Description

This command prints a list of all permanent jobs in the hard disk, or all temporary jobs, or both.

Format

Command	Parameter	Remarks
JOBL	1	Prints a list of all temporary jobs in the hard disk.
	2	Prints a list of all permanent jobs in the hard disk.

Example

```
!R! JOBL; EXIT;
```

This command prints a permanent job list.

Notes

- This command may be utilized to store a form such as a circulation slip, expense form, etc., in the harddisk for later recall without actually printing a barcode on the printout. Such forms can be directly printed by reading barcodes on the job list with the barcode reader BC-1.
- Other usages for this function may include checking the stored contents in the harddisk and to selectively delete jobs.

6. Job Deletion

Description

This command deletes the jobs stored in the harddisk.

Format

Command	Parameters	
JOBD [<SaveMode>,<Job ID>];	<SaveMode>	1: Temporary 2: Permanent
	<Job ID>	Job ID

This command deletes the job having the matching ID in the specified save mode. This does not return any error even when the ID does not exist.

This command must be used in one of the following five examples.

Example

```
!R! JOBD 1;"UUN01KA00"; EXIT;
```

The above example deletes the temporary job with ID "UUN01KA00" from the hard disk.

```
!R! JOBD 2,"7bgGsjL79"; EXIT;
```

The above example deletes the permanent job with ID "7bgGsjL79" from the harddisk.

```
!R! JOBD 1; EXIT;
```

The above example deletes all temporary jobs cached in the harddisk.

```
!R! JOBD 2; EXIT;
```

The above example deletes all permanent jobs cached in the harddisk.

```
!R! JOBD; EXIT;
```

The above example deletes all temporary and permanent jobs in the harddisk.

Notes

This command may be used to make more free space in the harddisk by deleting unnecessary jobs. Permanent jobs can be deleted one by one on the job list. Temporary jobs are automatically sorted with the least frequently accessed jobs first.

7. Disk Check

Description

This command verifies data in the harddisk (garbage collection).

Format

Command	Parameter
CDSK;	None

The current implementation for this command is only to delete garbage jobs. Its functionality will be expanded in the future.

Example

```
!R! CDSK; EXIT;
```

The above example deletes unnecessary jobs from the harddisk.

This command is to delete garbage such as page image data that were accidentally generated in the harddisk and normally inaccessible for deletion.

Remarks

- This command is valid with models having the harddisk installed.

8. Barcode Mode for the Serial Port

Description

This command introduces a particular mode for connecting the barcode reader to the serial port.

Format

```
FRPO S9,<Mode>;
```

FRPO parameter	S9	Serial port mode
	<Mode>	0: normal mode (default) 1: barcode reader mode

The S9 value is referred by the serial port device driver at initialization. When the <Mode> is 1, the device driver converts the received characters to special characters. Therefore, the serial port does not function in the normal serial communication protocol.

Example

```
!R! FRPO S9,0; EXIT;
```

The above example reverts the serial mode to normal.

Note
When the barcode reader BC-1 is connected to the printer's serial port for the electronic sorting mode, due to the restriction of size, only the ID code data can be printed on the printout. This code is then sent to the printer through the serial port, however, each emulation is unable to recognize the code as a job ID. This command is rendered to avoid this situation.

For example, when the barcode reader reads a barcode like {123456789} while S9 is 1, the device driver interprets "{" to !R! JOBO", and "}" to ";EXIT;.

The serial port mode is also changeable from the printer's front panel keys.

7.3. Devices

1. Stapling Option

Description

These commands staple the pages of a job.

Format

Command		Parameters
STPL [<Position>];	<Position>	Positions on the page to be stapled 1: Bottom left, angled 2: Top left, automatic angled or upright 3: Two centered If the <Position> value is invalid, the printer does not staple. If the parameter is omitted, 1 is automatically assumed.
STPC [<Number of sheets>];	<Number of sheets>	Number of sheets to be stapled M or m: Staple the maximum number of sheets that can be stapled. 0: Do not staple jobs that exceed the maximum number of sheets that can be stapled (M). –1: Staple only the sheets that exceed the maximum number of sheets that can be stapled (M). 2 to 20: Staple the number of specified sheets. When this parameter is omitted, “0” is assumed.

This command represents a trigger that starts stapling the subsequent job.

Staple parameters and positions

The upright stapling for 2 is for legal paper only.

Example

```
!R! STPL 3; STPC 5;
JOBS 2, 15, 1, 0, 1, ”Test file1”, ”Steve”,
”22/09/97 19:24”;
TEXT ”Hello”;PAGE;
UNIT C;BOX 5,10;PAGE;
JOBT;EXIT;
```

The above example staples the job defined by the commands given between JOBS and JOBT. Stapling is done every 5 sheets at the center, 2 parts, printing 15 copies of the job.

Notes

- This is a Prescribe notation of PJL. Only the current value is valid.
- Given a parameter, the current selection of the output stack is ignored.
- “JOG” and “JOB separation” are ignored.
- Pages are stapled at the end of job, then the command is cleared.
- STPL command causes a page break. It must be preceded by a command that implements resolution switching or a stack switching.
- Use the STPC command in combination with the STPL command. A job for which STPL was specified that consists of 21 or more sheets and for which STPC was not issued is processed in the same manner as if `STPC -1;` had been specified.

Examples of STPC command operation

When stapling was specified for a 50-page job (DF-30/DF-31)

STPC parameter	Stapling operation
M or m	20 sheets, 20 sheets, and 10 sheets are stapled.
15	15 sheets, 15 sheets, 15 sheets, and 5 sheets are stapled.
0	No stapling occurs.
–1	Sheets are output in groups of 20 from the stapling tray, and only the last 10 sheets are stapled.

2. Job Separate Option

Description

This command physically offsets the first page of a job from other pages.

Format

Command	Parameter
JOG;	None

This command renders the same functionality for both model ST-30 and model DF-30.

Example

```
!R! JOG; EXIT;
```

The above switches the offset mode on subsequent pages from "Job offset" to "Job separate," or vice versa.

Notes

• Selecting the jog mode must be made by FRPO S8 as follows:

FRPO S8=0	0=Job offset
FRPO S8=1	1=Job separate

Unlike the PJL offset which provides offset for each individual job, the JOG command affects any subsequent print jobs until another JOG command is issued. If the current mode is "Job offset," all the printed pages are stacked offset since JOG is issued until another JOG command is issued. If the mode is "Job separate," only the first page is offset to the other side. (This does not apply to the sequence between JOBS ... JOBT). When JOG is issued for a job defined between JOBS and JOBT, it affects the individual job (in the similar way as PJL). Therefore, JOG placed between JOBS and JOBT is ignored (except for the first page).

- The output stack is not switched. Use this command with STAK;.
- If used together with STPL, STPL overrides JOG, regardless of the order of issuing commands.
- It is recommended that the DF-30 is used in job separation mode; and the ST-30 is used in the job offset mode. (The printer prints considerably slower if the job offset is used with the DF-30.)

7.4. Sample Programs

1. JOG

```
!R!
STAK 3;
JOG;
JOBS 0,3,0,0,0,"JOG test","user 1","97/11/10";
TEXT "PAGE1";
PAGE;
TEXT "PAGE2";
PAGE;
TEXT "PAGE3";
PAGE;
JOBT;
EXIT;
```

2. STAPLE

```
!R!
JOBS 0,3,0,0;
STPL 3;
TEXT "PAGE1";
PAGE;
TEXT "PAGE2";
PAGE;
JOBT;
EXIT;
```

3. PERMANENT JOB

```
!R!
JOBS 2,3,2,2,0,”Permanent Job
Test”,
”Kyocera”,”97/11/10”;
TEXT ”PAGE1”;
PAGE;
TEXT ”PAGE2”;
PAGE;
TEXT ”PAGE3”;
PAGE;
JOBT;
JOBL;
EXIT;
```

4. TEMPORARY JOB

```
!R!
JOBS 1,1,1,0,0,”Temporary Job
Test”,
”Kyocera”,”97/11/10”;
TEXT ”PAGE1”;
PAGE;
TEXT ”PAGE2”;
PAGE;
TEXT ”PAGE3”;
PAGE;
JOBT;
EXIT;
```

Chapter 8

Prescribe 2c Specifications

This chapter describes in detail the Prescribe 2c command set for Kyocera color laser printers. The commands are listed in alphabetical order.

Note: **For details on the Prescribe 2c command set for black-and-white printers, refer to Chapter 2.**

8.1. Introduction

A simple description of a palette will be given before the “Color Prescribe” is described.

Imagine painting a picture using water colors.

When painting any picture, primary colors are typically put on a palette and these colors on the palette are used as needed. If the primary colors are not enough, several paints may be mixed to make new colors. A newly created color is placed in an open area on the palette.

If in the process of making the picture the palette becomes full while painting, it can be washed off and the colors recreated, or a different palette can be brought in to make new colors, or, if previously made colors are to be reused, an old palette can be brought in. When specifying a color using Prescribe, colors are specified based on the description of a palette and color relationships given above.

Of course conditions are different than painting a picture with paint. This concept of a palette is just a basic concept to work from.

8.2. Creating and Specifying Colors

Palette Overview

There are primarily two sets of information into which information on a palette is grouped in the case of a color printer.

•Header block	Color space, pixel encoding, palette size, size of each primary color
•Color information block	Color composition information for each color

Images can be classified as raster images (image printing) or non-raster images (text or vector graphics printing). The palette is used differently depending on what is being printed. In general, however, it is necessary to set the palette whatever type of printing is being performed. The following sections will describe palette creation, color creation and color specification.

Palette Creation

Colors cannot be specified regardless of the type of printing being performed unless a palette exists. For this reason, it is necessary to always create a palette. (A black-and-white palette is present by default.)

It is possible to create palettes by three different methods using Prescribe commands.
•Create a palette already defined by the system
•Create a palette which allows pantone color specification
•Create a palette which can be independently defined by the user

The user must create one of the palettes given above.

Color Creation

Creating a palette is not enough to create new colors. It is not necessary to create colors when using simple color or pantone color for which colors are already specified (although there are some exceptions). However, if the user wants to create colors, he or she must assign those colors to the created palette.

Colors are assigned by registering color composition information in the header of the palette in the required format. For example, if the color space is RGB, a color must be registered as RGB color distribution data. Even if an L*a*b color distribution is used for a palette for which an RGB color space is defined, the color tone which is output will be RGB.

Once the palette is created, colors on the palette may be selected. Colors may be selected when creating new colors using the number assigned to them within the palette. (In the case of pantone colors a palette can be created and a color specified simultaneously merely by selecting a pantone number.)

Color Specification

The method of specifying a color differs depending on the data to be printed. Since the color representing each pixel of a raster image differs, colors created on a palette are not used. (Color images which allow palette colors to be specified may be supported in the future.) The method for specifying colors for raster images and non-raster images will now be described.

Printing Non-Raster Images (Text or Vector Graphics)

First, select a palette and then specify the color you want to use from that palette.

Printing Raster Images

Since the color composition of each pixel is specifying directly for raster images, all information on the palette will not be accessed. However, since the color composition specification of each pixel differs depending on the color space being used, the palette header is accessed. This is why a palette is required even when printing a raster image.

Palette Control

Palettes may be created and deleted as necessary. They may also be copied. This type of control is conducted using the ID attached to each palette. This allows multiple palettes to exist at once and the ability to select the palette you want from several.

Relationship with PCL

PCL also includes this same concept of a palette. Palette information and color information can be passed on even if you change environments from PCL to Prescribe or Prescribe to PCL. In addition, even if the palette is changed under one of these environments, the colors do not change if a color has not been specified.

The information which can be set for palettes created using PCL is more detailed than that which can be set for palettes created using Prescribe. Accordingly, there are cases in which a new palette must be created within Prescribe when creating or specifying a color under Prescribe or when printing a raster image.

8.3. Relationship with Existing Prescribe Commands

Reset

The following items are initialized by the reset command.

- Palette
- Palette ID number
- Color specification
- Color mode
- Color matching

Initialize Status of all color information when initialized

- Palette
  All created palettes are deleted.
  Only the simple color monochrome palette exists.

- Palette ID number
  ID = 0 is set.

- Color specification
  Black from the simple color monochrome palette is specified.

- Color mode
  Color mode is as given by FRPO W1.
  The factory setting is “color mode”.

- Color matching
  Color matching is as given by FRPO W3.
  The factory setting is “None”.

Patterns

It is possible to apply a color to a pattern specified using PAT, FPAT, GPAT or XPAT. Note, however, that this may not always result in the exact same pattern as printed in monochrome.

The way a color looks may differ when used for different patterns even though the same color has been specified.

Macros

Color specifications may be used within macros. When an automacro is executed, the active palette and color index number are saved and restored after the macro has executed.

Raster Images

If a color is not specified for each pixel of a raster image, a pixel weighting (bit/index) specified using CID command must be created at 1 bps.

Although it is possible to print images using only a single color, in this case the transmitted image will not be faithfully reproduced in terms of dot reproduction.

Vector Graphics

It is possible to specify colors for all vector graphics.

Details are given elsewhere.

8.4. Overview of Prescribe 2c Commands by Function

1. Palette Creation Commands

Command	Function	Page
SIMP	Create a simple color palette	8-10
CID	Create a user-defined palette	8-12

2. Color Creation Commands

Command	Function	Page
ACLI	Assign colors to a palette: A description of methods of assigning colors to a created palette.	8-14

3. Palette Commands

Command	Function	Page
SPAL	Select a palette	8-16

4. Palette Control Commands

Command	Function	Page
CPAL	Delete and copy palettes and create palette IDs	8-18
SCPL	Save current palette	8-20
RPPL	Restore saved palette	8-22

5. Color Selection Commands

Command	Function	Page
SCOL	Select a color	8-24

6. Raster Image Commands

Command	Function	Page
RVCL	Transfer color image data	8-26

7. Mode Commands

Command	Function	Page
CMOD	Select the color mode	8-28
MCLR	Select color matching	8-30
QCLR	Select the color quality	8-32

SIMP — creates SIMPle color palette

Syntax

SIMP #1;

Parameters

#1:

Select a palette

Range

#1 = 1: Single plane K (Black) palette
3: 3-planes device RGB palette

Default

#1 = 1

Function

Creates a palette already defined by the system. This palette is a simple color palette and is either monochrome or allows 8 color specifications using 3-plane RGB.

If the number specified is not valid, the command is invalid.

The default palette is a monochrome palette.

Color assignments cannot be made to this palette.

The relationship is as follows between colors and index numbers which can be specified by SCOL commands for each palette.

The palette ID number is currently active and does not change.

Single plane	**INDEX**	**COLOR**
	0	White
	1	Black

3-plane RGB	**INDEX**	**COLOR**
	0	Black
	1	Red
	2	Green
	3	Yellow
	4	Blue
	5	Magenta
	6	Cyan
	7	White

CID — Configure Image Data

Syntax

CID #1, #2[, #3, #4, #5, #6];

Parameters

#1:
Color space specification

#2:
Pixel Encoding

#3:
RESERVED (Number of Bits per Index)

#4:
RESERVED (Number of Bits for Primary #1)

#5:
RESERVED (Number of Bits for Primary #2)

#6:
RESERVED (Number of Bits for Primary #3)

Range

#1 = 0: Device RGB
3: CIE L*a*b
#2 = 1: Index by Pixel
3: Direct by Pixel
#3 = 8: Reserved (8 Bits per Index)
#4 = 8: Reserved (8 Bits for Primary #1)
#5 = 8: Reserved (8 Bits for Primary #2)
#6 = 8: Reserved (8 Bits for Primary #3)

Default

#1 = 0
#2 = 1
#3 = 8
#4 = 8
#5 = 8
#6 = 8

Function

Creates a new color palette. Note that the currently active palette is deleted by this command.

It is possible to add and change colors on this palette.

The currently active colors do not change even though a new palette is created with this command.

The palette ID number is currently active and does not change.

The color representation direction differs depending on the color space specified. Setting values specified by the ACLI command differ depending on this setting.

Although the same colors as simple colors are defined for index numbers 0 through 7 when an RGB color space is specified, even the color assignments for these indices can be changed using the ACLI command.

The color reproduction method differs depending on the pixel encoding specification.

Index by Pixel:	when assigning colors to a palette -> Text or vector graphics images
Direct by Pixel:	when directly specifying colors for each pixel -> Raster graphics images

Comment

Parameters #3 through #6 are reserved for future expandability.

If a value outside the valid range is specified, the command is invalid.

ACLI — Assign CoLor Index

Syntax

ACLI #1, #2, #3, #4;

Parameters

#1:
Index number

#2:
Color specification for primary color 1

#3:
Color specification for primary color 2

#4:
Color specification for primary color 3

Range

$0.0 \leqq \#1 \leqq 255$
$0.0 \leqq \#2 \leqq 32767.0$
$0.0 \leqq \#3 \leqq 32767.0$
$0.0 \leqq \#4 \leqq 32767.0$

Function

Assigns colors to the currently active palette.

Colors cannot be created if the palette is a simple color or pantone color palette. This command is ignored if used on such a palette.

If a color is assigned to the specified index number, the currently active color for that index number will be disabled and a newly created color will be assigned to that index number.

If the index number is larger than the palette size, the command is invalid.

Valid values for the color composition depend on the color space specification.

RGB: 0 ~ 255
L*a*b: 0.0 ~ 100.0

Any value beyond the decimal point specified for an RGB color space is discarded.

If the specified value is outside the valid range of values, it is rounded to that boundary value.

The relationship between the color space and parameters is as follows.

RGB	#2: Primary color 1 color = R	L*a*b	#2: Primary color 1 color = L
	#3: Primary color 2 color = G		#3: Primary color 2 color = *a
	#4: Primary color 3 color = B		#4: Primary color 3 color = *b

SPAL — Select PALette

Syntax

SPAL #1;

Parameters

#1:
Palette ID number

Range

0 ≦ #1 ≦ 32767

Default

#1 = 0

Function

Selects the palette to activate from among the palettes created.

If a currently active palette number is specified, this command is ignored.

If no palette is associated with the specified number, this command is ignored.

When the palette of the specified number is active and a command for creating a palette is received, the active palette is deleted. The active palette number does not change.

All palettes are deleted by the reset command, leaving only the default palette.

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CPAL — Control PALette

Syntax

CPAL #1[, #2];

Parameters

#1:

Palette control

#2:

Palette ID number

Range

#1 = A: Delete all palettes
S: Delete all stacked palettes
D: Delete the palette having the specified ID
C: Copy the active palette to the specified ID

0 ≦ #2 ≦ 32767

Default

#1 = -
#2 = 0

Function

Controls the palette number defined by parameter #2.

If a palette number is not specified, the command is processed using “0” as the ID number.

If A is specified,
all existing palettes are deleted and the active palette returns to the default palette. In this case, the palette ID becomes “0”.
Note that palettes on the stack are not deleted.
Also, any ID specified by parameter #2 is not used.

If S is specified,
all palettes on the stack are deleted. The active palette is not affected.
Also, any ID specified by parameter #2 is not used.

If D is specified,
and there is a palette having the ID number specified by the #2, that palette is deleted.
If the ID number specifies the currently active palette, the active palette returns to the default monochrome palette.
The ID number specified by #2 does not change.

If C is specified,
the currently active palette is copied to the ID specified by parameter #2.
If a palette having the same ID number already exists, that palette is overwritten.
If the ID is the same as that currently active ID number, the command is ignored.

The function of parameter #2 is to supply an ID number. It is not for selecting a palette or changing the active palette.

No check is made whether the palette ID number given already exists for another palette.

The palette ID number is reset to “0” by the reset command.

SCPL — Save Current PaLette

Syntax

SCPL;

Parameters

None

Function

Saves the currently active palette.

This command does not change the active palette.

The current palette can be saved as long as there is enough memory. If there is insufficient memory, a memory overflow will result and the palette will not be saved.

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RPPL — Return to Previous PaLette

Syntax

RPPL;

Parameters

None

Function

A palette restored using this command immediately becomes active.

If the saved palette does not exist, this command does not result in a palette change.

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SCOL — Select COLor

Syntax

SCOL #1;

Parameters

#1:
Index number

Range

0 ≦ #1 ≦ 255

Default

#1 = 0

Function

Selects a color from the currently active palette.

If no color is assigned to the specified number, this command is ignored.

If the specified number exceeds the valid range, this command is invalid.

This specification has the following relationship to printed contents.

Valid printing contents

- Text printing
- Vector graphics
- Monochrome patterns
- Monochrome raster images

Invalid printing contents

- Color patterns
- Color raster images

Once a color is specified, the active color does not change until the next color specification is made even if a palette is created, changed or deleted.

RVCL — ReceiVe CoLor raster data

Syntax

RVCL [#1,] #2, #3;

Parameters

#1:

Compression mode

#2:

Data length

#3:

Data

Range

#1 = 0: No compression
1: Execution length encode
2: TIFF

#3 = 0H ~ FFH

Default

#1 = 0

Function

Accepts the transfer of color image data.

Although no check is made of the data format regarding whether the transfer represents monochrome or color data, since it must conform to the active palette, the correct figure will not be printed if the palette and data do not match.

The end of raster data is indicated using ENDR command.

When transmitting color images, always specify a palette using the CID command. Data will not be processed correctly if the palette is specified using the SIMP or PANT commands.

If the image data actually sent exceeds the width or height of the specified source data, the excessive portion will be deleted (clipped).

Make a direct color specification for each pixel when transmitting color image data.

Specify the number of bytes of data to be sent for the data length.

An 8 bps color specification is used for the color data for each pixel. Also, this command is only valid for an RGB color space. Accordingly, 3 bytes of data must be sent for each pixel to be drawn when transferring color images.

Note **Color cannot be included with the image transfer commands (RVCD, RVRD) supported by existing models. If either of these commands is received, the internal system will automatically switch to a monochrome, 1 bps palette to process the command. However, the existing active palette is saved and restored at the beginning and end of the command in question so there is no need to change the palette or color before or after image transfer is performed.**

CMOD — Color MODe

Syntax

CMOD #1;

Parameters

#1:
Mode number

Range

0 ≦ #1 ≦ 1

#1 = 0: Monochrome
1: Color

Default

#1 = 1

Function

This setting is used to switch between monochrome and color modes.

In monochrome mode, all of the color commands are enabled, but all data is converted to monochrome grayscale for printing.

This command includes a form feed operation.

In monochrome mode, all color matching is set to “0: None”.

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MCLR — Match CoLoR

Syntax

MCLR #1;

Parameters

#1:
ID number

Range

0 ≦ #1 ≦ 3

#1 = 0: None
1: Auto
2: Vivid Color
3: Display

Default

#1 = 0

Function

Selects color matching.

This setting changes the mode set according to the various conditions of emulation, paper type, and print quality.

If the color mode is monochrome mode, “0: None” will be selected automatically.

This command includes a form feed operation.

- 0: None
  Do not perform color matching.

- 1: Auto
  Automatically selects color correction mode depending on the printing data.

Text or vector graphics data ->	processed using Vivid Color.
Raster image data ->	processed using Display mode.

- 2: Vivid color
  Performs cyan-related color correction.

- 3: Display
  Performs color correction suited to the standard display.

QCLR — Quality CoLoR

Syntax

QCLR #1;

Parameters

#1:
ID number

Range

0 ≦ #1 ≦ 1

#1 = 0: Normal
1: Quick
2: Reserved
3: Reserved

Default

#1 = 0

Function

Selects the color quality.

This setting changes the mode set according to the various conditions of emulation, paper type, and print quality.

If the paper type is OHP, this setting is ignored and OHP mode is automatically set. If a return is made to regular paper, the printer returns to the mode specified by this command.

If the color mode is monochrome, this mode will not affect printing operations.

This command includes a form feed operation.

- 0: Normal
  Data is printed using 4-process colors, CMYK.
- 1:
  Data is printed using 3-process colors, CMY.

Chapter 9

Virtual Mail Box (VMB) Specifications

The Virtual Mail Box (VMB) function electronically sorts printing data without using the optional sorter. After the printer performs rasterization processing on printing data that is sent from the host computer, this function stores the data in a virtual mail box on the hard disk. For details on which models support the Virtual Mail Box function, refer to the User's Manual.

9.1. Background

There is no physical sorter/stacker on printers that have the virtual mailbox function. A sorter and mailbox function in conjunction with the MPS function should therefore be provided to users using the printers by incorporating a built-in virtual mailbox (VMB).

Furthermore, the virtual mailbox should consist of a high value added mailbox function which cannot be implemented by a physical mailbox.

9.2. Concept

The basic concept behind the virtual mailbox is to virtually support the functions of physical sorters such as the SO-6 and SO-30 using a harddisk drive and then add functions that cannot be implemented on a physical sorter.

To implement this function, data is saved on the harddisk drive as rasterized data without actually outputting data sent from the host to paper. Saving to the harddisk drive means that data has been input to the tray of the virtual mailbox. The data can be actually printed out on paper by specifying the virtual tray number using the panel or BC-1. This allows output jobs to be clearly classified just as with a physical mailbox. Since this is a mailbox, all data in the virtual tray on the harddisk drive is deleted after it has finished being printed out.

The following types of functions are proposed as functions which cannot be implemented using a physical mailbox.

- Password protection function

  A password can be set for each virtual mail box. Once a password has been set for a virtual mail box, the corresponding output/delete bar code no longer appears in the VMB list, eliminating the possibility that an important document, etc., could be printed without permission (see page 2-359).

- Up to 255 virtual mail boxes can be set up

  A maximum of 255 virtual mail boxes can be set up, making it possible to allocate documents not just for individual departments or groups, but even for individual people.

- Large capacity

  A single virtual mail box can hold as many pages as desired, subject to the constraints of available space in the hard disk. The JOBP command is used to set the capacity of virtual mail boxes (see page 2-147).

- Mailbox with document distribution function

  In applications such as distributing materials for a meeting, the same document can be sent to all virtual mailbox trays which have been specified. This lessens network traffic since print data is only sent to the printer once compared with sending the original document file by e-mail and having each recipient print it out. Also, it is not necessary for each recipient to run an application to print the data. In addition, even when a document is sent to multiple trays, it is possible for each tray to share a single rasterized save data file. This reduces print data processing time by the printer and allows efficient use of overall mailbox capacity.

9.3. VMB Function Overview

Setting the Maximum Harddisk Drive Capacity Used by the VMB Function

Each tray of the virtual mailbox is actually implemented by managing jobs saved on the harddisk drive at the virtual tray level. Also, since the harddisk drive is used by other functions such as MPS and font download, it is possible to set the maximum harddisk drive capacity (total virtual tray capacity) which can be used by the VMB function. Since the page size of each job saved on the harddisk drive differs for each page, this capacity is specified in terms of total save capacity rather than as a number of pages as with a physical mailbox.

Method of Input to a Virtual Tray

Using a special VMB driver, print data is sent to the printer by specifying the virtual tray number to be output or the virtual tray alias. The special VMB driver will be provided in the form of an upgrade to the special MPS driver. Sent jobs are registered with the specified virtual tray on the harddisk drive. Data is not actually printed out on paper at this time.

Ending Input to a Virtual Tray

Input to a virtual tray ends when the printer receives a virtual tray input end command.

Method of Output from a Virtual Tray

Data registered for a virtual tray on the harddisk drive is actually printed out on paper by specifying the virtual tray number to be output using the printer's front panel or BC-1.
When the locked mailbox function is being used, a password must be input at the same time as the output specification.

Deleting Virtual Tray Contents

Virtual tray contents can be deleted without actually printing the data. This can be done for individual trays or all virtual trays. When deleting a job in a virtual tray for which a password has been set, the password must also be input at the time of deletion.

Setting the Locked Mailbox Function

A password can be set for any virtual tray when you wish to use a virtual tray as a locked mailbox. Also, since the master password of the administrator can also be set, the master password can be used as the active password for all trays in cases such as when someone forgets their individual password.

Setting the Virtual Tray Alias

By assigning an alias to each virtual tray, it is possible to specify a tray using a character string, such as an individual name or group name, rather than using the tray number. This allows the mailbox function to be used much more conveniently.

Checking Virtual Tray Usage

Information concerning each virtual tray, such as number of pages, can be checked using a VMB virtual tray usage list.

9.4. VMB Operation Commands

Maximum Harddisk Drive Capacity for VMB Use Set Command

Functions

Sets the maximum harddisk drive capacity which can be used by the VMB function.

Command and Parameters

Command	Parameters	Remarks
JOBP #1, #2;	#1 Output option	72: VMB capacity limit setting
	#2 Parameter	0 to 99 (100 MB units): Default 0

Example

```
!R! JOBP 72, 3; EXIT;
```

This sets the maximum harddisk drive capacity used by the VMB function to 300 MB.

Functions, Limitations and Notes

- Since the default value is 0, the harddisk drive capacity which can be used by the VMB must be set by this command first before beginning to use the virtual mailbox function.

- This limit only applies to the total save capacity of all virtual trays, and is unrelated to the save capacity of each virtual tray.

- If this command is used to specify a smaller size than that currently used by the VMB function, excess data of jobs already stored in virtual trays will not be immediately deleted. However, it will not be possible to input any new jobs into virtual trays until jobs in virtual trays have been output to get below the new set value.

- Processing is as follows when an attempt is made to stack a job on a virtual tray and the total job capacity of VMB virtual trays has reached the set capacity limit.

Print data	Thrown away
Front panel LCD	Displays “Virtual Mail Box full” while throwing data away
The user is notified of the error (data thrown away)	Information regarding the job which was thrown away is displayed in the error log.

- Error Log Example

KYOCERA ECOSYS Page Printer

VMB ERROR LOG

```
VMB Job storage size:     total          MB
                          used           MB
                          available    0 MB

No.          Job name        User name       Date
-------------------------------------------------------------------------------------------------

 1           Form 1          Kyocera         Aug/12/98
                                             12:26:46

 2           Form 2          Administrator   Sep/08/98
                                             05:17:47

 3           Form 3          Softman         Sep/16/98
                                             09:58:25
```

- When job output is specified for each virtual tray, an error log is automatically output after all normally input jobs are finished being output. This error log displays a history of jobs for which input to the virtual tray failed. The error log is not output if there are no jobs for which input failed. If input failed for all jobs of a virtual tray to be output, only this log will be output.

- A “Full!!” is displayed beside the save capacity of each virtual tray displayed on the VMB LIST (see page 9-20) for trays where job input has failed (where an error log will be printed).

Virtual Tray Stack Start Command

Functions

Starts stacking jobs on a VMB virtual tray.

Command and Parameters

Command	Parameters			Remarks
JOBS #1,#2,#3,#4 [,#5,#6,#7,#8];	#1 Spool mode			8: Save to VMB virtual tray
	#2 Mopier counter			1 to 999 (copies)
	#3	#4: 0	Stack destination virtual tray number	1 to 255 or character string representing alias
		#4: Other than 0	Stack destination virtual tray start number	
	#4 Stack destination virtual tray end number			0: output only to virtual tray specified by #3 1 to 255 or character string representing alias: Stack destination virtual tray end number or character string representing alias (where a tray number larger than #3 has been specified)
	#5 (Reserved)			Fixed at 0
	#6 Job name (may be omitted)			Up to 31 bytes
	#7 User name (may be omitted)			Up to 31 bytes
	#8 Time stamp (may be omitted)			Up to 31 bytes

Examples

```
!R! JOBS 8, 3, ”Softman”, 0, 0, ”Test job”,
”Softman”, ”14/01/98 16:30:25”;
UNIT C; MZP 5, 10; BOX 6, 6; PAGE; TEXT ”ABCDE”;
PAGE; TEXT ”123456”; PAGE;
JOBT; EXIT;
```

This stacks the jobs between JOBS and JOBT on the virtual tray named “Softman”.

```
!R! JOBS 8, 3, 3, 15, 0, ”Test job”, ”Softman”,
”14/01/98 16:30:25”;
UNIT C; MZP 5, 10; BOX 6, 6; PAGE; TEXT ”ABCDE”;
PAGE; TEXT ”123456”; PAGE;
JOBT; EXIT;
```

This stacks the jobs between JOBS and JOBT on all virtual trays having numbers 3 to 15.

Functions, Limitations and Notes

- Specifying “8” for parameter #1 sets VMB virtual tray spool mode. Note that in this case the meaning of parameters #3 to #5 differ from MPS spool mode.

- If parameters #3 and #4 are used to specify that jobs to be stacked on multiple virtual trays and the value of #4 is less than that of #3, the stack destination virtual tray specified by the JOBS command will be only that tray specified by parameter #3.

- Processing is as follows when no virtual tray corresponds to the alias given.

Print data	Thrown away
Front panel LCD	Displays alias error (see page 9-25.)
The user is notified of the error (data thrown away)	Information regarding the job which was thrown away is displayed in the error log (see page 9-7.)

- If JOBS-JOBT pairs are nested or if they are not paired properly, the job defined between the innermost JOBS-JOBT pair will be taken. This is also true when used in comtrayation with JOBS for MPS function start.

- The command is invalid if any of the job name, user name or time stamp exceed 31 bytes. Note that the job which would have been placed in a virtual tray will be immediately output on actual paper.

- Note that if parameters #3 and #4 do not specify a valid stack destination virtual tray number (1 to 255), or if the JOBP command does not include a valid stack destination virtual tray specification (see page 9-11), the job in question will not be saved to any virtual tray and no error will be displayed.

- While jobs are being stacked on a virtual tray, a message indicating that jobs are being stacked on virtual trays (when the VMB-compatible driver is being used) will be displayed on the front panel LCD instead of “Processing”.

Virtual Tray Send Destination Additional Command

Function

Additionally specifies input destination virtual trays.

Command and Parameters

Command	Parameters	Remarks
JOBP #1,#2;	#1 Output option	80: Specifies a VMB additional input destination virtual tray
	#2 Parameter	1 to 255 or character string representing an alias

Examples

```
!R! JOBP 80, 3; EXIT;
```

Stacks jobs on virtual tray number “3” in addition to virtual trays specified by parameters #3 and #4 of the JOBS command.

```
!R! JOBP 80, ”Softman”; EXIT;
```

Stacks jobs on the virtual tray having the alias “Softman” in addition to virtual trays specified by parameters #3 and #4 of the JOBS command.

Functions, Limitations and Notes

- It is possible to specify multiple output destination virtual trays by issuing multiple instances of this command.
- If no virtual tray corresponds to the alias given, an error will be displayed on the front panel. (See page 9-25.)
- This command is enabled until the first page of the job is output. The JOBP command is ignored from the output of the first page until the JOBT command is issued.
- Nothing is affected if a virtual tray already specified for output is specified a second time.

Virtual Tray Stack End Command

Function

Ends stacking jobs on a VMB virtual tray.

Command and Parameters

Command	Parameters
JOBT;	None

Example

```
!R! JOBS 8, 3, 3, 0, 0, ”Test job”, ”Softman”,
”14/01/98 16:30:25”;
UNIT C: MZP 5, 10; BOX 3, 3; PAGE;
TEXT ”ABCDEF”; PAGE;
TEXT ”12345”; PAGE;
JOBT;
TEXT ”GHIJKL”; PAGE;
TEXT ”67891011”; PAGE;
EXIT;
```

The pages between JOBS and JOBT are output to virtual tray number 3. Pages after JOBT are output to the current physical stack.

Functions, Limitations and Notes

- In addition to the JOBT command, virtual tray output also ends when the interface is switched, when there is an FF timeout (ready recovery), or when the CANCEL key of the printer is pressed, or when the UEL command is encountered other than between JOB and EOJ (same specification as for MPS jobs). (UEL, JOB and EOJ are PJL commands.) If tray output ends due to the CANCEL key being pressed, that job will be entirely deleted. Later pages are output to the current physical stack.

- The JOBT command does not include a form feed. Accordingly, if no form feed occurs between JOBS and JOBT the job will be registered as a pageless job.

Virtual Tray Stack Job Output Command

Function

Outputs jobs stacked on a VMB virtual tray.

Command and Parameters

Command	Parameters	
JOBO #1,#2[,#3];	#1	Fixed at 8 (8 to 15 are reserved by the VMB function)
	#2	1 to 255: Number of virtual tray to be output Character string: Alias of virtual tray to be output
	#3	Password (when set)

Examples

```
!R! JOBO 8, 3; EXIT;
```

Outputs the jobs stacked on virtual tray number “3”, for which no password is set, on actual paper.

```
!R! JOBO 8, ”Softman”, 9999; EXIT;
```

Outputs the jobs stacked on the virtual tray with the alias “Softman”, for which the password “9999” is set, on actual paper.

Functions, Limitations and Notes

- All data in the virtual tray specified by #2 is output on actual paper. After output is finished, all data in the virtual tray given by #2 is deleted.

- A stack of jobs being output on actual paper is taken as the current stack (all output to the same stack). Note however in the case of staple jobs that the stack will be forcibly changed to the staple tray.

- In the case of a tray number for which a password is set, an error will result if no password or an incorrect password is specified (see page 9-25.)

- If during virtual tray input multiple output is specified by the #2 parameter of the JOBS command, that job will be sorted and output in the specified number of copies upon output by this command.

- The master password is valid for all virtual trays for which a password is set (only when a master password is set).

- If there is no job in the specified virtual tray, an error will be displayed on the front panel (see page 9-25.) Note however that it is never possible to select a virtual tray with no jobs from the front panel.

- If no virtual tray corresponds to the alias given, an error will be displayed on the front panel. (See page 9-25.)

- If a password is specified by parameter #3 for a virtual tray for which no password is set, that password specification will be ignored, and the command will be interpreted as if parameter #3 were omitted.

- If the CANCEL key is pressed during virtual tray job output, output processing will halt and the printer will return to Ready status. The job being output and jobs in the virtual tray not yet output can be output by another output specification.

Virtual Tray Stack Job Delete Command

Function

Deletes jobs stacked on a VMB virtual tray.

Command and Parameters

Command		Parameters
JOBD #1[,#2[,#3]];	#1	8: Deletes job contents of the VMB virtual tray specified by #2 (Does not affect password or alias settings of the tray.) 9: Deletes the VMB virtual tray specified by #2. (Password and alias are both deleted. Tray is returned to unused status.) 15: Resets all VMB virtual trays.
	#2	0: Resets all VMB virtual trays. 1 to 255: Number of virtual tray to be deleted Character string: Alias of virtual tray to be deleted
	#3	0: Resets all VMB virtual trays. Password: (If set)

Examples

```
!R! JOBD 8, 3, 9999; EXIT;
```

Deletes the jobs stacked on virtual tray number “3”, for which the password 9999 is set.

```
!R! JOBD 9, 3, 9999; EXIT;
```

Returns virtual tray number “3”, for which the password 9999 is set, to unused status.

```
!R! JOBD 15, 0, 0; EXIT;
```

Returns the VMB to factory settings.

Functions, Limitations and Notes

- This command simply deletes the contents of VMB virtual trays; it never results in output on paper.

- The entire VMB function can be reset only when parameters #1, #2 and #3 are 15, 0 and 0, respectively. This can be used when both tray passwords and the master password have been forgotten.

- The master password is valid for all virtual trays.

- If no virtual tray corresponds to the alias given, an error will be displayed on the front panel. (See page 9-25.)

- If a password is specified by parameter #3 for a virtual tray for which no password is set, that password specification will be ignored, and the command will be interpreted as if parameter #3 were omitted.

Password Set Command

Function

Sets the output password for a VMB virtual tray. (This is the locked mailbox function.)

Command and Parameters

Command		Parameters
VMPW #1,#2,#3;	#1	0: Sets the master password 1 to 255: Number of virtual tray for which the password is being set Character string: Alias of virtual tray for which the password is being set
	#2	1 to 65535: Current password for the virtual tray specified by #1 0: Indicates no password is set for the virtual tray specified by #1
	#3	1 to 65535: New password for the virtual tray specified by #1 0: Indicates no password is to be set for the virtual tray specified by #1

Examples

```
!R! VMPW 3, 0, 9999; EXIT;
```

Sets 9999 as the password for virtual tray number “3” for which no password is set.

```
!R! VMPW ”Softman”, 9999, 0; EXIT;
```

Sets no password for the virtual tray with the alias “Softman” for which the password 9999 had been set.

```
!R! VMPW ”Softman”, 9999, 3333; EXIT;
```

Changes the password for the virtual tray with the alias “Softman” from 9999 to 3333.

Functions, Limitations and Notes

- Only virtual trays for which a password has been set using this command are locked mailboxes.
- If this command is used on a virtual tray for which a password is already set, that password must be specified by parameter #2 or the command will be invalid and an error will be displayed on the front panel. (See page 9-25.)
- If the password specification fails, an error will be displayed on the front panel. (See page 9-25.)
- If no virtual tray corresponds to the alias given, an error will be displayed on the front panel. (See page 9-25.)
- The master password is valid as the current password for all virtual trays.
- No output or delete barcode is displayed on the VMB LIST (see page 9-20) for virtual trays for which a password has been set.

Virtual Tray Alias Set Command

Function

Sets an alias for a VMB virtual tray.

Command and Parameters

Command	Parameters	
VMAL #1,#2[,#3];	#1	1 to 255: Number of virtual tray for which the alias is being set Character string: Alias of virtual tray for which the alias is being set
	#2	Character string representing the alias being set for the virtual tray given by #1 (up to 31 bytes)
	#3	The password for the virtual tray given by #1 if a password has been set for it.

Example

```
!R! VMAL 3, ”Softman”, 9999; EXIT;
```

Sets the alias “Softman” for virtual tray number 3 for which the password 9999 has been set.

Functions, Limitations and Notes

- When an alias is set for a virtual tray using this command, that alias may be used to identify the tray just like the virtual tray number.
- If this command is used on a virtual tray for which an alias has already been set, the old alias will be overwritten.
- If an alias is to be set for a virtual tray for which a password is set, that virtual tray’s password is required. An error will be displayed on the front panel if no password or the incorrect password is specified. (See page 9-25.)
- If the alias specified has already been set for another virtual tray, an error will be displayed on the front panel and the specification will be invalid. (See page 9-25.)
- Note that if command syntax is incorrect, such as when an alias longer than 31 bytes is specified, the command will be invalid and no error will be displayed on the front panel.
- The master password is valid for all virtual trays.

Virtual Tray List (Virtual Mail Box List) Output

Function

Outputs a list representing the usage status of virtual mail-boxes.

Command and Parameters

Command	Parameters
JOBL #1;	#1 8: Outputs VMB virtual tray usage status list

Example

```
!R! JOBL 8; EXIT;
```

Functions, Limitations and Notes

•Example of VMB virtual tray usage status list output

KYOCERA ECOSYS Page Printer

VIRTUAL MAIL BOX LIST

VMB Job storage size: total MB / used MB / available MB

Output (1) or Delete (1)

GO! (2)

Bin No.	Alias	Jobs	Pages	Normal/Shared Size(KB)		
1	Gers	17	56	24203 /	1132	
2	Cave	1	3	0 /	1132	
3		0	0	0 /	0	Full!!
4	Gra	2	11	1132 /	7217	
5	Polo	3	19	15567 /	0	

- Regardless of whether trays contain any data, tray information is only displayed for trays which have been used at least once.

- The information displayed for each virtual tray is: the tray number, the alias set for the tray, the number of jobs in the tray, the number of pages, the size of jobs held in that tray only, and the size of jobs entered in other trays as well (multiple tray common jobs).

- A is displayed over the tray number for virtual trays which contain jobs.

- A "Full!!" is displayed next to the job size entry for virtual trays containing jobs which caused an error during virtual tray input. An error log (see page 9-7) indicating job input failure information is also output when jobs within such a tray are output.

- The "Job output/delete" barcode in the virtual tray job list is not output for virtual trays for which a password is set.

- An MPS job list is output if the parameter is omitted.

9.5. Passwords

Password Types

There are two types of password which can be set for VMB virtual trays: a master password set for all trays and a regular password set for each separate virtual tray.

The master password is a password for use by the administrator and can be used as the password for all virtual trays. As such, only one master password may be set for the VMB function. The primary example of using the master password is in place of the regular password for a virtual tray when it has been forgotten.

The password set for each virtual tray is only valid for that virtual tray.

Password Specifications

Passwords may be freely set to any value from 1 to 65535. “0” indicates that no password is to be set (cancel password).

9.6. Front Panel

This section describes front panel operations and displays which are related to the VMB function.

Operations during VMB Virtual Tray Stack Job Output

Front Panel Menu

The front panel menu used during VMB virtual tray stack job output is like that shown in the example front panel LCD display depicted in the figure below. If the alias cannot be displayed in the space next to the tray number, the entire alias character string can be checked by scrolling the alias.

Example Front Panel LCD Display

```
HARD DISK>
```

```
>Print VMB data
Tray003:arai
```

```
>User ID
09899
```

Outputting Jobs in Virtual Trays Without Passwords

Pressing the ENTER key on the "`Print VMB data Tray003?arai`" screen shown in *Front Panel Menu* will display the alias corresponding to the virtual tray number. The + and – keys sequentially display virtual tray candidates which contain jobs. Selecting the virtual tray you wish to output and pressing the ENTER key, will internally issue the JOBO command using that virtual tray number, causing the jobs in that VMB virtual tray to be output.

Outputting Jobs in Virtual Trays With Passwords

When outputting jobs in a virtual tray for which a password is set, first select the virtual tray you wish to output from the "`>Print VMB data`" screen just as in *Outputting Jobs in Virtual Trays Without Passwords* and press the ENTER key. If a password is set for that tray, the "`>Print VMB data`" screen will change to the "`>User ID`" screen. At this point, enter the correct password and press the ENTER key. The JOBO command will be internally issued using the virtual tray number selected and its password as parameters, causing the jobs in that VMB virtual tray to be output. If the password is incorrect, an error will be displayed. (See page 9-25.)

Note that the password value entered on the "`>User ID`" screen is reset (returns to showing "00001") when MODE SELECT mode is exited.

Outputting VMB Virtual Tray Usage Status Lists

VMB virtual tray usage status lists are output from the "`HARD DISK`" menu's "`List of VMB ?`" screen.

Front Panel LCD Display

`HARD DISK>`	`>List of VMB ?`

Error Displays

FRP error displays related to the VMB function are as follows.

Error contents	Front Panel Display	Processing after error cancellation
Alias error (alias setting failed or no virtual tray corresponds to the alias)	HARDDISK error 85 Press CONTINUE	Return to Ready
Password error (there is no password specification, the password is incorrect, or password setting failed)	HARDDISK error 86 Press CONTINUE	Return to Ready
There are jobs or pages which cannot be read out (job destroyed) during virtual tray job output.	HARDDISK error 88 Press CONTINUE	Return to Ready
There is no job in the virtual tray for which output was specified or that virtual tray is not being used.	HARDDISK error 89 Press CONTINUE	Return to Ready

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