

**The Product Comparison Guide
for HP Languages on HP Plotters
and Large-Format Printers**

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Many product updates and fixes do not require manual changes and, conversely, manual corrections may be done without accompanying product changes. Therefore, do not expect a one to one correspondence between product updates and manual revisions.

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First edition, November 1991
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This edition includes information about

- The Hewlett-Packard DesignJet 430, 450C and 455CA printers.
- The model B versions of the Hewlett-Packard DesignJet 700 and 750C Plus plotters.

New editions are complete revisions of the manual. Change sheets, which may be issued between editions, contain additional information. The dates on the title page change only when a new edition is published. Minor corrections that do not affect the function of the product may be made at reprint without a change to the print date.

The seventh edition involved a change in the title from

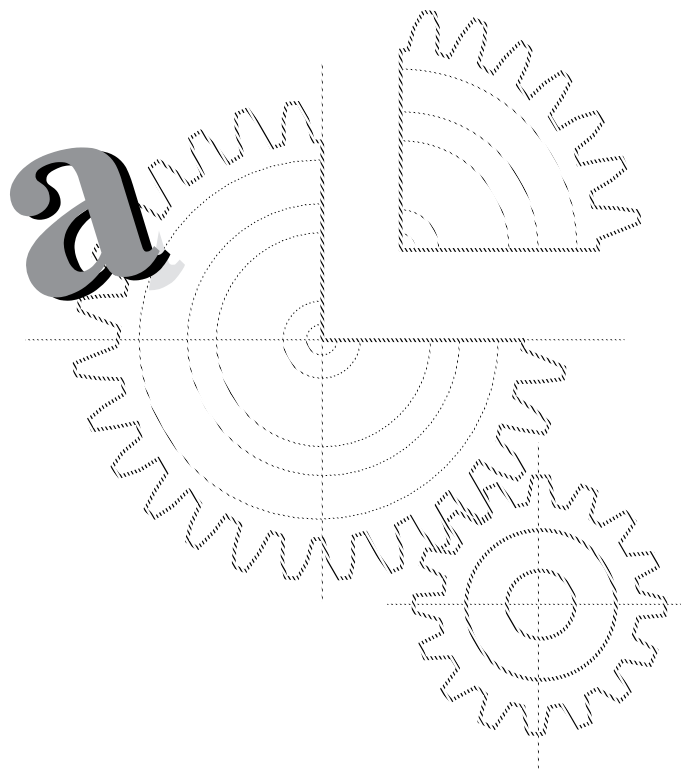
*The Product Comparison Guide for
HP-GL/2 and HP RTL Peripherals*

to

*The Product Comparison Guide for
HP Languages on HP Plotters and
Large-Format Printers*

with a consequent change in its content: information about the use of PJJ commands on the HP DesignJet Series was added; information about the HP PaintJet XL and XL300, LaserJet III, and DeskJet 1200C and 1200C/PS devices was removed.

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**The Product Comparison Guide
for HP Languages on HP Plotters
and Large-Format Printers**

Using the HP Languages Comparison Guide

This manual helps you design hardware, firmware, or software for Hewlett-Packard plotters and large-format printers that support HP-GL/2 and HP RTL. It shows the differences and similarities between plotter and printer models to help you define an HP-GL/2 and HP RTL solution that is compatible across a variety of these peripherals.

In its way, this *Comparison Guide* is a companion to *The HP-GL/2 and HP RTL Reference Guide*, which describes the vector graphics language instructions and HP's Raster Transfer Language (RTL) commands. In this *Comparison Guide*, the instructions and commands are described generically; that is, the explanations do not rely on any one peripheral or type of peripheral. This guide, however does show how specific peripherals and technologies support these languages. It does not tell you how individual instructions and commands work. Care has been taken not to duplicate information unnecessarily; much of the information that was previously duplicated from *The HP-GL/2 and HP RTL Reference Guide* has been deleted.

- Chapter 1 has tables of supported media, P1/P2 locations, and maximum plotting area for each peripheral.
- Chapter 2 gives you more information about peripheral features you might want to consider when developing your solution.
- Chapter 3 shows how HP-GL/2 is supported by the products.
- Chapter 4 compares HP RTL among the peripherals that support it.
- Chapter 5 summarizes the Printer Job Language (PJM) commands supported by HP DesignJet devices.

Whenever possible, we have used the plotter or printer name with which you may be more familiar, rather than the model number for the specific peripheral. For example, you will find *HP DesignJet 755CM* listed, rather than *HP C3198A* or *C3198B*.

All devices described in this guide are “plotters,” not “printers,” as defined in Chapter 1 of the third edition of *The HP-GL/2 and HP RTL Reference Guide*, part number 5961–3526.

The Product Comparison Guide for HP Languages on HP Plotters and Large-Format Printers applies to the following current HP-GL/2 and HP RTL peripherals:

Large-Format Peripherals

- HP DesignJet Series plotters and printers (HP DesignJet 700 and 750C Plus plotters and 430, 450C, 455CA, 755CM, 2000CP and 2500CP printers)
- HP DraftMaster Series plotters (SX Plus, RX Plus and MX Plus)
- HP DraftPro Plus plotter

Small-Format Peripherals

- HP 7550 Plus plotter

Peripherals No Longer Marketed

This guide also includes the following HP-GL/2 peripherals that are no longer marketed:

- HP DesignJet plotter — 1992
HP DesignJet 200 plotter — 1994
HP DesignJet 220 and 650C plotters — 1995
HP DesignJet 230, 250C, 600 and 750C plotters — 1996
HP DesignJet 330 and 350C plotters — 1997
- HP DraftMaster Series plotters (SX, RX and MX) — 1991
- HP 7600 Series plotters (Models 240D/E) — 1990
HP 7600 Series plotters (Models 250, 255 and 355) — 1992

Devices No Longer Included in this Book

This guide no longer includes information about the following peripherals:

- HP PaintJet XL 300 color printer and the HP PaintWriter XL printer (using the optional HP-GL/2 cartridge)
- HP DeskJet 1200C and 1200 C/PS printers
- HP LaserJet III printer

Information about the HP-GL/2 commands supported by the HP DeskJet and HP LaserJet printers is included in the *PCL 5 Comparison Guide*, part number 5961-0702.



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Media and Plotting Area



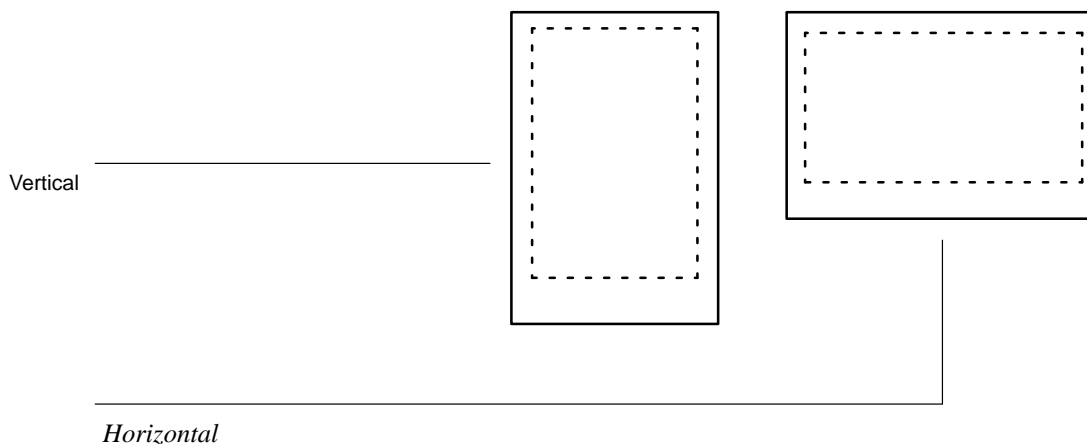
Reading the Media Tables

This section lists much of the media supported on each plotter. Some devices, such as the electrostatic plotters accept only one size roll media. Other peripherals accept a wide range of sheet media. Some of those may also accept roll media.

For each media size specified in the tables, we list the following:

- **default P2 location**—This is specified in plotter units (1 plotter unit = 0.025 mm). This number is based on precise media size in excellent conditions. Your P2 location will vary with the media's actual size and with changes to the media due to humidity. The number given here is most likely within ± 40 plotter units. The P1 location for all HP-GL/2 peripherals defaults to (0,0) and is not listed in any tables.
- **default maximum plotting area**—This is specified in millimeters and inches for all media listed. Actual size varies with changes in humidity. The size listed is most likely within ± 1 mm (0.04 in.).

Note that you have a choice with most media sizes as to whether you load it vertically or horizontally into the plotter. (Vertical and horizontal are also called portrait and landscape, respectively.) How you load media determines the maximum plotting area you have available and the orientation of the coordinate axes. The coordinate system tracks the orientation of the media; the X-axis is always the long side of the media. The examples below show margins as the media is loaded vertically and horizontally into the plotter.



HP DesignJet Series Plotters and Printers

These plotters handle sheet media from 210 mm to 927 mm (8.3 to 36.5 inches). They also accept standard size roll media.

Margins:	Extended *	Normal	Smaller †
Leading edge:	27 mm	17 mm	10 mm
Each side:	15 mm	15 mm * 5 mm §	15 mm * 5 mm §
Trailing edge:	27 mm	17 mm	10 mm

* HP DesignJet 2000CP and 2500CP printers only.

§ All HP DesignJets except the 2000CP and 2500CP printers.

† **Expanded** margins on HP DesignJet 650C plotters.

The following pages list information for popular sheet media sizes. For long-axis plotting on the HP DesignJet and DesignJet 600 plotters, you can specify a plot length up to 15.2 m (50 ft, which is 609,600 plotter units). The HP DesignJet 2000CP and 2500CP printers support a plot length up to 45.7 m (150 ft, 1,828,800 plotter units).

On the original HP DesignJet plotter, you could not expand the plotting area; you could only add extra space for cutting. The HP DesignJet 330, 350C, 600, 650C, 700, 750C, and 750C Plus plotters and 430, 450C, 455CA, 755CM, 2000CP and 2500CP printers let you expand your plotting area along the length of roll media.

Normal Margins (roll & sheet media) HP DesignJet Series plotters and printers				
Media Size	P2 Location		Maximum Plotting Area (X- and Y-axes)	
	P2X,	P2Y	millimeters	inches
A (vertical)	9 816,	8 236	245.4 x 205.9 mm	9.66 x 8.10 in.
A (horizontal)	7 276,	10 776	181.9 x 269.4 mm	7.16 x 10.60 in.
B (vertical)	15 912,	10 776	397.8 x 269.4 mm	15.66 x 10.60 in.
B (horizontal)	9 816,	16 872	245.4 x 421.8 mm	9.66 x 16.60 in.
C (horizontal)	20 992,	16 872	524.8 x 421.8 mm	20.66 x 16.60 in.
C (horizontal)	15 912,	21 952	397.8 x 548.8 mm	15.66 x 21.60 in.
D (vertical)	33 184,	21 952	829.6 x 548.8 mm	32.66 x 21.60 in.
D (horizontal)	20 992,	34 144	524.8 x 853.6 mm	20.66 x 33.60 in.
E (vertical)	43 344,	34 144	1083.6 x 853.6 mm	42.66 x 33.60 in.
Architectural C (vertical)	23 024,	17 888	575.6 x 447.2 mm	22.66 x 17.60 in.
Architectural C (horizontal)	16 928,	23.984	423.2 x 599.6 mm	16.66 x 23.60 in.
Architectural D (vertical)	35 216,	23 984	880.3 x 599.6 mm	34.66 x 23.60 in.
Architectural D (horizontal)	23 024,	36 176	575.6 x 904.3 mm	22.66 x 35.60 in.
Architectural E1 30 X 42 (vertical)	41 312,	30 080	1032.8 x 752.0 mm	40.66 x 29.60 in.
Architectural E (vertical)	47 408,	36 176	1185.2 x 904.3 mm	46.66 x 35.60 in.
A4 (vertical)	10 520,	8 000	263 x 200 mm	10.35 x 7.87 in.
A4 (horizontal)	7 040,	11 480	176 x 287 mm	6.92 x 11.29 in.

Normal Margins (roll & sheet media) HP DesignJet Series plotters and printers

Media Size	P2 Location		Maximum Plotting Area (X- and Y-axes)	
	P2X,	P2Y	millimeters	inches
A3 (vertical)	15 440,	11 480	386 × 287 mm	15.19 × 11.29 in.
A3 (horizontal)	10 520,	16 400	263 × 410 mm	10.35 × 16.14 in.
A2 (vertical)	22 400,	16 400	560 × 410 mm	22.04 × 16.14 in.
A2 (horizontal)	15 440,	23 360	386 × 584 mm	15.19 × 22.99 in.
A1 (vertical)	32 280,	23 360	807 × 584 mm	31.77 × 22.99 in.
A1 (horizontal)	22 400,	33 240	560 × 831 mm	22.04 × 32.71 in.
A0 (vertical)	46 200,	33 240	1155 × 831 mm	45.47 × 32.71 in.

**Smaller Margins (roll media only) HP DesignJet Series plotters and printers
(Expanded margins on HP DesignJet 650C plotters)**

Media Size	P2 Location		Maximum Plotting Area (X- and Y-axes)	
	P2X,	P2Y	millimeters	inches
A (vertical)	10 376,	8 236	259.4 × 205.9 mm	10.21 × 8.10 in.
A (horizontal)	7 836,	10 776	195.9 × 269.4 mm	7.71 × 10.60 in.
B (vertical)	16 472,	10 776	411.8 × 269.4 mm	16.21 × 10.60 in.
B (horizontal)	10 376,	16 872	259.4 × 421.8 mm	10.21 × 16.60 in.
C (vertical)	21 552,	16 872	538.8 × 421.8 mm	21.21 × 16.60 in.
C (horizontal)	16 472,	21 952	411.8 × 548.8 mm	16.21 × 21.60 in.
D (vertical)	33 744,	21 952	843.6 × 548.8 mm	33.21 × 21.60 in.
D (horizontal)	21 552,	34 144	538.8 × 853.6 mm	21.21 × 33.60 in.
E (vertical)	43 904,	34 144	1 097.6 × 853.6 mm	43.21 × 33.60 in.
Architectural C (vertical)	23 584,	17 888	589.6 × 447.2 mm	23.21 × 17.60 in.
Architectural C (horizontal)	17 488,	23 984	437.2 × 599.6 mm	17.21 × 23.60 in.
Architectural D (vertical)	35 776,	23 984	894.4 × 599.6 mm	35.21 × 23.60 in.
Architectural D (horizontal)	23 584,	36 176	589.6 × 904.39 mm	23.21 × 35.60 in.
Architectural 30 X 42 (vertical)	41 872,	30 080	1 046.8 × 752.0 mm	41.21 × 29.60 in.
Architectural E (vertical)	47 968,	36 176	1 199.2 × 904.4 mm	47.21 × 35.60 in.
A4 (vertical)	11 080,	8000	277 × 200 mm	10.90 × 7.87 in.
A4 (horizontal)	7 600,	11 480	190 × 287 mm	7.48 × 11.29 in.
A3 (vertical)	16 000,	11 480	400 × 287 mm	15.74 × 11.29 in.
A3 (horizontal)	11 080,	16 400	277 × 410 mm	10.90 × 16.14 in.
A2 (vertical)	22 960,	16 400	574 × 410 mm	22.59 × 16.14 in.
A2 (horizontal)	16 000,	23 360	400 × 584 mm	15.74 × 22.99 in.
A1 (vertical)	32 840,	23 360	821 × 584 mm	32.32 × 22.99 in.
A1 (horizontal)	22 960,	33 240	574 × 831 mm	22.59 × 32.71 in.
A0 (vertical)	46 760,	33 240	1 169 × 831 mm	45.02 × 32.71 in.

HP DraftMaster Series Plotters

The HP DraftMaster SX and SX Plus plotter handles only single sheet media, while the HP DraftMaster RX, RX Plus, MX, and MX Plus plotters handle roll and sheet media.

Due to the widths of the grit tubes, there is a specific set of media that will fit on the SX, RX, and MX plotter models. The SX Plus, RX Plus, and MX Plus plotters can handle any media within the range 207 mm to 919 mm (8.15 inches to 36.2 inches).

The following pages list information for sheet media sizes that are supported on the SX, RX, and MX models as well as the newer SX Plus, RX Plus, and MX Plus models.

For long-axis plotting on the HP DraftMaster RX, MX, RX Plus, or MX Plus plotters, you can specify a plot length up to 45.7 m (150 ft). This is equivalent to a length of 1,828,800 plotter units.

Margins:	Normal	Expanded
Leading edge:	16 mm	5 mm
Sides:	16 mm each	5 mm each
Trailing edge:	40 mm	29 mm

Normal Margins Media Size	HP DraftMaster Series plotters			
	P2 Location		Maximum Plotting Area (X- and Y-axes)	
	P2X,	P2Y	millimeters	inches
A (vertical)	8 936,	7 356	223.4 × 183.9 mm	8.80 × 7.24 in.
A (horizontal)	9 896,	6 396	247.4 × 159.9 mm	9.74 × 6.30 in.
B (vertical)	15 032,	9 896	375.8 × 247.4 mm	14.80 × 9.74 in.
C (horizontal)	21 072,	15 032	399.8 × 223.4 mm	20.74 × 14.80 in.
D (vertical)	32 304,	21 072	807.6 × 526.8 mm	31.80 × 20.74 in.
D (horizontal)	33 264,	20 112	831.6 × 502.8 mm	32.74 × 19.80 in.
E (vertical)	42 464,	33 264	1 061.6 × 831.6 mm	41.80 × 32.74 in.
Architectural C (horizontal)	23 104,	16 048	577.6 × 401.2 mm	22.74 × 15.80 in.
Architectural D (vertical)	34 336,	23 104	858.4 × 577.6 mm	33.80 × 22.74 in.
Architectural D (horizontal)	35 296,	22 144	882.4 × 553.6 mm	34.74 × 21.80 in.
Architectural 30 X 42 (vertical)	40 432,	29 200	1 010.8 × 730.0 mm	39.80 × 28.74 in.
Architectural 30 X 42 (horizontal)	41 392,	28 240	1 034.8 × 706.0 mm	40.74 × 27.80 in.
Architectural E (vertical)	46 528,	35 296	1 163.2 × 882.4 mm	45.80 × 34.74 in.
A4 (vertical)	9 640,	7 120	241.0 × 178.0 mm	9.49 × 7.01 in.
A4 (horizontal)	10 600,	6 160	265.0 × 154.0 mm	10.43 × 6.06 in.
A3 (vertical)	14 560,	10 600	364.0 × 265.0 mm	14.33 × 10.43 in.

Normal Margins		HP DraftMaster Series plotters			
Media Size	P2 Location	Maximum Plotting Area (X- and Y-axes)			
		P2X,	P2Y	millimeters	inches
A2 (horizontal)	22 480, 14 560			562.0 × 364.0 mm	22.13 × 14.33 in.
A1 (vertical)	31 400, 22 480			785.0 × 562.0 mm	30.91 × 22.13 in.
A1 (horizontal)	32 360, 21 520			809.0 × 538.0 mm	31.85 × 21.18 in.
A0 (vertical)	45 320, 32 360			1 133.0 × 809.0 mm	44.61 × 31.85 in.

Expanded Margins		HP DraftMaster Series plotters			
Media Size	P2 Location	Maximum Plotting Area (X- and Y-axes)			
		P2X,	P2Y	millimeters	inches
A (vertical)	9 736, 8 236			243.4 × 205.9 mm	9.58 × 8.11 in.
A (horizontal)	10 776, 7 196			179.9 × 269.4 mm	7.08 × 10.61 in.
B (vertical)	15 832, 10 776			395.8 × 269.4 mm	15.58 × 10.61 in.
C (horizontal)	21 952, 15 832			548.8 × 395.8 mm	21.61 × 15.58 in.
D (vertical)	33 104, 21 952			827.6 × 548.8 mm	32.58 × 21.61 in.
D (horizontal)	34 144, 20 912			522.8 × 853.6 mm	20.58 × 33.61 in.
E (vertical)	43 264, 34 144			1 081.6 × 853.6 mm	42.58 × 33.61 in.
Architectural C (horizontal)	23 984, 16 848			599.6 × 421.2 mm	23.60 × 16.58 in.
Architectural D (vertical)	35 136, 23 984			878.4 × 599.6 mm	34.58 × 23.61 in.
Architectural D (horizontal)	36 176, 22 944			904.4 × 573.6 mm	35.61 × 22.58 in.
Architectural 30 X 42 (vertical)	41 232, 30 080			1 030.8 × 752.0 mm	40.58 × 29.61 in.
Architectural 30 X 42 (horizontal)	29 040, 42 272			726.0 × 1 056.8 mm	28.58 × 41.61 in.
Architectural E (vertical)	43 264, 33 128			1 081.6 × 828.2 mm	42.58 × 32.61 in.
A4 (vertical)	10 440, 8 000			261.0 × 200.0 mm	10.28 × 7.87 in.
A4 (horizontal)	11 480, 6 960			287.0 × 174.0 mm	11.30 × 6.85 in.
A3 (vertical)	15 360, 11 480			384.0 × 287.0 mm	15.12 × 11.30 in.
A2 (horizontal)	23 360, 15 360			584.0 × 384.0 mm	22.99 × 15.12 in.
A1 (vertical)	32 200, 23 360			805.0 × 584.0 mm	31.69 × 22.99 in.
A1 (horizontal)	33 240, 22 320			831.0 × 558.0 mm	21.97 × 32.72 in.
A0 (vertical)	46 120, 33 240			1 153.0 × 831.0 mm	45.39 × 32.72 in.

HP DraftPro Plus Plotter

This plotter handles only sheet media. The HP DraftPro Plus plotter does not support long-axis plotting.

Margins:	Normal	Expanded
Leading edge:	15 mm	5 mm
Sides:	15 mm each	5 mm each
Trailing edge:	39 mm	31 mm

Note that the D/A1-size model cannot handle those standard media sizes with a width greater than 635 mm (25.02 inches).

Media Size	Normal Margins				HP DraftPro Plus plotter	
	P2 Location		Maximum Plotting Area		(X- and Y-axes)	
	P2X,	P2Y	millimeters	inches		
A (vertical)	9 016,	7 436	225.4 × 185.9 mm	8.87 × 7.31 in.		
A (horizontal)	9 976,	6 476	249.4 × 161.9 mm	9.81 × 6.37 in.		
B (vertical)	15 112,	9 976	377.8 × 249.4 mm	14.87 × 9.81 in.		
B (horizontal)	16 072,	9 016	401.8 × 225.4 mm	15.81 × 8.87 in.		
C (vertical)	20 192,	16 072	504.8 × 401.8 mm	19.87 × 15.82 in.		
C (horizontal)	21 152,	15 112	528.8 × 377.8 mm	20.81 × 14.87 in.		
D (vertical)	32 384,	21 152	809.6 × 528.8 mm	31.87 × 20.81 in.		
D (horizontal)	33 344,	20 192	833.6 × 504.8 mm	32.81 × 19.87 in.		
E (vertical)	42 544,	33 344	1 063.6 × 833.6 mm	41.87 × 32.81 in.		
Architectural C (vertical)	22 224,	17 088	555.6 × 427.2 mm	21.87 × 16.81 in.		
Architectural C (horizontal)	23 184,	16 128	579.6 × 403.2 mm	22.81 × 15.87 in.		
Architectural D (vertical)	34 336,	23 104	858.4 × 577.6 mm	33.87 × 22.81 in.		
Architectural D (horizontal)	35 296,	22 144	882.4 × 553.6 mm	34.81 × 21.87 in.		
Architectural 30 X 42 (vertical)	40 512,	29 280	1 012.8 × 732.0 mm	39.87 × 28.87 in.		
Architectural 30 X 42 (horizontal)	41 472,	28 320	1 036.8 × 708.0 mm	40.81 × 27.87 in.		
Architectural E (vertical)	46 608,	35 376	1 165.2 × 884.4 mm	45.87 × 34.81 in.		
A4 (vertical)	9 720,	7 200	243.0 × 180.0 mm	9.56 × 7.08 in.		
A4 (horizontal)	10 680,	6 240	267.0 × 156.0 mm	10.51 × 6.14 in.		
A3 (vertical)	14 640,	10 680	366.0 × 267.0 mm	14.40 × 10.51 in.		
A3 (horizontal)	15 600,	9 720	390.0 × 243.0 mm	15.35 × 9.56 in.		
A2 (vertical)	21 600,	15 600	540.0 × 390.0 mm	21.25 × 15.35 in.		
A2 (horizontal)	22 560,	14 640	564.0 × 366.0 mm	22.20 × 14.40 in.		
A1 (vertical)	31 480,	22 560	787.0 × 564.0 mm	30.98 × 22.20 in.		
A1 (horizontal)	32 440,	21 600	811.0 × 540.0 mm	31.92 × 21.25 in.		
A0 (vertical)	45 400,	32 440	1 135.0 × 811.0 mm	44.68 × 31.92 in.		

Expanded Margins		HP DraftPro Plus plotter		
Media Size	P2 Location		Maximum Plotting Area (X- and Y-axes)	
	P2X,	P2Y	millimeters	inches
A (vertical)	9 736,	8 236	243.4 × 205.9 mm	9.58 × 8.10 in.
A (horizontal)	10 776,	7 196	269.4 × 179.9 mm	10.60 × 7.08 in.
B (vertical)	15 832,	10 776	395.8 × 269.4 mm	15.58 × 10.60 in.
B (horizontal)	16 872,	9 736	421.8 × 243.4 mm	16.60 × 9.58 in.
C (vertical)	20 912,	16 872	522.8 × 421.8 mm	20.58 × 16.62 in.
C (horizontal)	21 952,	15 832	548.8 × 395.8 mm	21.60 × 15.58 in.
D (vertical)	33 104,	21 952	827.6 × 548.8 mm	32.58 × 21.60 in.
D (horizontal)	34 144,	20 912	853.6 × 522.8 mm	33.60 × 20.58 in.
E (vertical)	43 264,	34 144	1 083.6 × 853.6 mm	42.58 × 33.60 in.
Architectural C (vertical)	22 944,	17 888	555.6 × 427.2 mm	21.58 × 16.60 in.
Architectural C (horizontal)	23 984,	16 848	579.6 × 403.2 mm	22.60 × 15.58 in.
Architectural D (vertical)	35 136,	23 984	878.4 × 599.6 mm	34.58 × 23.60 in.
Architectural D (horizontal)	36 176,	22 944	904.4 × 573.6 mm	35.60 × 22.58 in.
Architectural 30 X 42 (vertical)	41 232,	30 080	1 030.8 × 752.0 mm	40.58 × 29.58 in.
Architectural 30 X 42 (horizontal)	42 272,	29 040	1 056.8 × 726.0 mm	41.60 × 28.58 in.
Architectural E (vertical)	47 328,	36 176	1 183.2 × 904.4 mm	46.58 × 35.60 in.
A4 (vertical)	10 440,	8 000	261.0 × 200.0 mm	10.27 × 7.87 in.
A4 (horizontal)	11 480,	6 960	287.0 × 174.0 mm	11.29 × 6.85 in.
A3 (vertical)	15 360,	11 480	384.0 × 287.0 mm	15.11 × 11.29 in.
A3 (horizontal)	16 400,	10 440	410.0 × 261.0 mm	16.14 × 10.27 in.
A2 (vertical)	22 320,	16 400	558.0 × 410.0 mm	21.96 × 16.14 in.
A2 (horizontal)	23 360,	15 360	584.0 × 384.0 mm	22.99 × 15.11 in.
A1 (vertical)	32 200,	23 360	805.0 × 584.0 mm	31.69 × 22.99 in.
A1 (horizontal)	33 240,	22 320	831.0 × 558.0 mm	32.71 × 21.96 in.
A0 (vertical)	46 120,	33 240	1 153.0 × 831.0 mm	45.39 × 32.71 in.

HP 7550 Plus Plotter

This is a small-format plotter. It handles sheet media only.

Margins:	Normal	Expanded
Leading edge:	16 mm	5 mm
Sides:	16 mm each	5 mm each
Trailing edge:	40 mm	29 mm

HP 7550 Plus plotter				
Media Size	P2 Location		Maximum Plotting Area (X- and Y-axes)	
	P2X,	P2Y	millimeters	inches
A (vertical)	10 170,	7 840	254.2 × 196.0 mm	9.97 × 7.68 in.
B (vertical)	16 450,	10 170	411.2 × 254.2 mm	16.12 × 9.97 in.
A4 (vertical)	10 870,	7 600	271.7 × 190.0 mm	10.65 × 7.45 in.
A3 (vertical)	15 970,	10 870	399.2 × 271.7 mm	15.65 × 7.68 in.

HP 7600 Series Electrostatic Plotters

Each electrostatic plotter model accepts only one size of roll media, either an E-size roll or a D-size roll.

- E-size plotters include the HP 7600 Series Model 355, 255, and 240E plotters.
- D-size plotters include Models 250 and 240D plotters.

HP 7600 Series Electrostatic plotters				
Media Size	P2 Locations		Default maximum plotting area (X- and Y-axes)	
	P2X,	P2Y	millimeters	inches
D 609 mm (24 inches) *	34 544,	22 352	863.6 × 558.8 mm	34.0 × 22.0 in.
E 914 mm (36 inches) **	44 704,	34 544	1 117.6 × 863.6 mm	44.0 × 34.0 in.

* The maximum width you can specify on the Model 250 is 24 000 plotter units. Use the HP-GL/2 PS instruction to increase or decrease the default media size.

** The maximum width you can specify on the Model 255 or Model 355 in monochrome mode is 35 840 plotter units. When using the Model 355 in color mode, the maximum width is 34 560 plotter units. Use the HP-GL/2 PS instruction to increase or decrease the default media size.

These are the default values as selected by the control panel. You can also specify smaller media sizes through the control panel, though the physical width of the media remains the same. The smaller media sizes use the entire length and width of that media; for example, selecting A-size media through the control panel yields an 8.5-inch × 11-inch plot (on pen plotters, the plot would be smaller due to necessary margins).

The maximum plot length for each of the HP 7600 Series plotter models is 50 ft (609 600 plotter units). Use the PS instruction to set the longer plot length.

Product Features

The following tables show some of the product features of which you may want to take advantage.

Internal Disk

Peripheral	Internal Disk Size
HP DraftMaster MX and MX Plus plotters	20 Megabytes
HP 7600 Series plotters	40 Megabytes
HP DesignJet 2500CP printers	2.0 Gigabytes

Input/Output Buffers

Peripheral	I/O Buffer Size
HP DraftMaster Series plotters	1 Megabyte
HP DraftPro Plus plotter	Almost 1 Megabyte
HP 7550 Plus plotter	32 Kilobytes (can be expanded to 2 MB)

Memory

Peripheral	Memory
HP DesignJet plotter	2 Megabytes (can be expanded to 10 MB)
HP DesignJet 200 and 220 plotters	2 Megabytes (can be expanded to 10 MB)
HP DesignJet 230, 250C, 330, and 350C plotters and 430, 450C and 455CA printers	4 Megabytes (can be expanded to 36 MB)
HP DesignJet 600 and 650C (models C2858A and C2859A) plotters	4 Megabytes (can be expanded to 20 MB)
HP DesignJet 650C (models C2858B and C2859B) plotter	4 Megabytes (can be expanded to 68 MB)
HP DesignJet 700 and 750C plotters	7 Megabytes (can be expanded to 71 MB)
HP DesignJet 750C Plus plotter	11 Megabytes (can be expanded to 75 MB)
HP DesignJet 755CM printer	71 Megabytes
HP DesignJet 2000CP printer	8 Megabytes (can be expanded to 68 MB)
HP DesignJet 2500CP printer	20 Megabytes (can be expanded to 68 MB)

PostScript

Peripheral	PostScript Supported
HP DesignJet 650C, 700, 750C and 750C Plus plotters	Yes, optional
HP DesignJet 755CM and 2500CP printers	Yes

Interfaces

Peripheral	Interfaces Supported
HP DesignJet 200, 220, 230, and 250C plotters	RS-232-C, IEEE-1284-compatible parallel, HP JetDirect EX
HP DesignJet 330 and 350C plotters and 430 and 450C printers	RS-232-C, IEEE-1284-compatible parallel with ECP mode built in
HP DesignJet 600 and 650C plotters	RS-232-C, Centronics Parallel, HP JetDirect
HP DesignJet 700, 750C and 750C Plus plotters and 455CA and 755CM printers	RS-232-C, IEEE-1284-compatible parallel, HP JetDirect
HP DesignJet 2000CP and 2500CP printers	IEEE-1284-compatible parallel, HP JetDirect
HP DraftMaster Series plotters	RS-232-C, HP-IB
HP DraftPro Plus plotter	RS-232-C, Centronics parallel
HP 7550 Plus plotter	RS-232-C, Centronics parallel*, HP-IB*
HP 7600 Series plotters	RS-232-C, Centronics parallel, HP-IB

* The HP 7550 Plus either has an RS-232-C and Centronics Parallel interface, or RS-232-C and HP-IB interface.

Monochrome Output

Your output is plotted in color or monochrome according to the settings from the setup sheet (or front panel) or the @PJM SET RENDERMODE command. Normally the PJL setting wins if there is any conflict. However, for the HP DesignJet 250C, 350C, 700, 750C and 750C Plus plotters and the 450C, 455CA, 755CM, 2000CP and 2500CP printers, if you specify through the front panel or the setup sheet that the pen settings are to be taken from tables or the builtin Palettes, not from software, the PJL setting is ignored. Also, for the HP DesignJet 350C, 700, 750C and 750C Plus plotters and the 450C, 455CA, 755CM, 2000CP and 2500CP printers, the command @PJM SET PALETTE=SOURCE=DEVICE forces the front panel settings to be used for both palette and color/monochrome setting.

If the @PJM SET RESOLUTION command is used with the HP DesignJet 700, 750C and 750C Plus plotters or the 755CM printer, the value **600** forces grayscale output, irrespective of any color specifications.

PJM commands used with these devices are summarized on page 51.

7586 HP-GL Emulation

The HP DesignJet 2000CP and 2500CP printers do not support HP-GL emulation.

HP-GL/2 Comparison



Power-On Defaults

On application of power, each HP-GL/2 peripheral performs an initialization cycle to set certain conditions to predefined values. These default values can differ from device to device, and some functions are not implemented on all devices. The values are the same as those of the DF (Default Values) instruction, defined in *The HP-GL/2 and HP RTL Reference Guide*.

HP-GL/2 Overview

In the tables that make up this section, the following notations indicate the status of an instruction or extension for a device.

- Indicates the peripheral's support of the instruction.
- NOP** Indicates that the peripheral ignores the instruction, but does not generate an error. (The Transparency Mode [TR] instruction is the exception to this rule; an error is generated when it occurs on a device that NOPs it.)

The following table shows the different component groups of HP-GL/2 and the devices on which they are supported.

HP-GL/2 Peripheral	HP-GL/2 Language						
	Kernel	Extensions					
		Techni cal Graphi cs ¹	Palette	Dual Contex t	Digitizi ng	Advan ced Drawin g	Advan ced Text
HP DesignJet Series	●	●	●	●		● ³	● ³
HP DraftMaster Series ²	●	●	●		●		
HP DraftPro Plus	●	●	●		●		
HP 7550 Plus	●	●	●		●		
HP 7600 Series 240D/240E	●	●					
HP 7600 Series 250/255/355	●	●	●	●			

¹ Note that the output instructions require a bidirectional interface such as RS-232-C

² Includes the SX, SX Plus, RX, RX Plus, MX, and MX Plus plotter models

³ Except the original HP DesignJet plotter

HP-GL/2 Instructions

Parameter fields must be specified in the format defined by each instruction. Refer to *The HP-GL/2 and HP RTL Reference Guide* for more information and examples.

The tables below show which devices support which HP-GL/2 instructions (Inst.).

- Means that all models of the device listed support the instruction fully, as defined in *The HP-GL/2 and HP RTL Reference Guide*, subject to any limits or restrictions shown in the notes on pages 21 through 24.
- × Means that the instruction is not supported or is NOP'd (see above).

Configuration and Status Group

Inst.	HP DesignJet Series	HP DraftMaster Series	HP Draft-Pro Plus	HP 7550 Plus	HP 7600 Series
CO	●	●	●	●	●
DF	●	●	●	●	●
IN	●	●	●	●	●
IP	●	●	●	●	●
IR	●	●	●	●	●
IW	● [1]	● [1]	● [1]	● [1]	● [2]
PG	●	●	● [3]	●	●
RO	●	●	●	●	●
RP	● [4, 5, 6, 7]	● [4, 8]	● [4, 8]	● [4, 8]	● [4, 8]
SC	● [1]	● [1]	● [1]	● [1]	● [2]

Vector Group

Inst.	HP DesignJet Series	HP DraftMaster Series	HP Draft-Pro Plus	HP 7550 Plus	HP 7600 Series
AA	● [1, 9]	● [1, 9]	● [1, 9]	● [1, 9]	● [2, 9]
AR	● [1, 9]	● [1, 9]	● [1, 9]	● [1, 9]	● [2, 9]
AT	● [1, 9]	● [1, 9]	● [1, 9]	● [1, 9]	● [2, 9]
CI	● [1, 9]	● [1, 9]	● [1, 9]	● [1, 9]	● [2, 9]
PA	● [1]	● [1]	● [1]	● [1]	● [2]
PD	● [1]	● [1]	● [1]	● [1]	● [2]
PE	● [1, 10]	● [1, 11]	● [1, 10]	● [1, 11]	● [2, 10]
PR	● [1]	● [1]	● [1]	● [1]	● [2]
PU	● [1]	● [1]	● [1]	● [1]	● [2]
RT	● [1, 9]	● [1, 9]	● [1, 9]	● [1, 9]	● [2, 9]

Polygon Group

Inst.	HP DesignJet Series	HP DraftMaster Series	HP Draft-Pro Plus	HP 7550 Plus	HP 7600 Series
EA	● [1]	● [1]	● [1]	● [1]	● [2]
EP	●	●	●	●	●
ER	● [1]	● [1]	● [1]	● [1]	● [2]
EW	● [1, 9]	● [1, 9]	● [1, 9]	● [1, 9]	● [2, 9]
FP	● [12]	●	●	●	●
PM	●	●	●	●	●
RA	● [1, 12]	● [1]	● [1]	● [1]	● [2]
RR	● [1, 12]	● [1]	● [1]	● [1]	● [2]
WG	● [1, 9, 12]	● [1, 9]	● [1, 9]	● [1, 9]	● [2, 9]

Line and Fill Attributes Group

Inst.	HP DesignJet Series	HP DraftMaster Series	HP Draft-Pro Plus	HP 7550 Plus	HP 7600 Series
AC	● [1, 12, 13]	● [1]	● [1]	● [1]	● [2]
FT	● [12, 14]	● [15]	● [16]	● [15]	●
LA	● [17]	● [17]	● [17]	● [17]	● [17]
LT	●	●	●	●	●
PW	● [10, 12, 18]	● [11, 19]	● [10, 19]	● [11, 19]	● [10]
RF	● [10, 12, 20]	● [11, 21]	● [10, 22]	● [11, 21]	● [10]
SM	●	●	●	●	●
SP	●	● [11]	● [10]	● [11]	● [10]
UL	●	●	●	●	●
WU	● [12]	●	●	●	●

Character Group

Inst.	HP DesignJet Series	HP DraftMaster Series	HP Draft-Pro Plus	HP 7550 Plus	HP 7600 Series
AD	● [12, 23]	● [23]	● [23]	● [23]	● [23]
CF	● [10, 12, 24, 25]	NOP	NOP	NOP	● [10, 26]
CP	●	●	●	●	●
DI	●	●	●	●	●
DR	●	●	●	●	●
DT	●	●	●	●	●
DV	●	●	●	●	●
ES	●	●	●	●	●
LB	●	●	●	●	●
LO	●	●	●	●	●
SA	●	●	●	●	●
SD	● [12, 23]	● [23]	● [23]	● [23]	● [23]
SI	● [12]	●	●	●	●
SL	●	●	●	●	●
SR	● [12]	●	●	●	●
SS	●	●	●	●	●
TD	●	●	●	●	●

Technical Graphics Extension

Inst.	HP DesignJet Series	HP DraftMaster Series	HP Draft-Pro Plus	HP 7550 Plus	HP 7600 Series
BP	●	●	●	●	240D/E: NOP ; others: ●
CT	●	●	●	●	●
DL	●	●	●	●	●
EC	●	SX, SX Plus: NOP ; others: ●	NOP	NOP	●
FR	●	●	● [27]	●	●
MC	●	NOP	NOP	NOP	240D/E: NOP ; others: ●
MG	NOP	●	●	●	●
MT	NOP	● [28]	● [28]	● [28]	240D/E: NOP ; others: ● [28]
NR	NOP	●	●	●	240D/E: NOP ; others: ●
OE	●	●	●	●	●
OH	●	●	●	●	●
OL	●	●	●	●	●
OP	● [1]	● [1]	● [1]	● [1]	● [2]
OS	●	●	●	●	●
PS	● [1]	● [1]	● [1]	● [1]	● [2]
QL	●	●	● [29]	●	240D/E: NOP ; others: ●
ST	NOP	●	●	●	240D/E: NOP ; others: ●
VS	NOP	● [11, 30]	● [10, 31]	● [11]	240D/E: NOP ; others: ● [10]

Palette Extension

Inst.	HP DesignJet Series	HP DraftMaster Series	HP Draft-Pro Plus	HP 7550 Plus	HP 7600 Series
CR	●	NOP [32]	NOP [32]	NOP [32]	240D/E: ×; others: ● [33]
NP	● [10, 34]	● [11]	● [10]	● [11]	240D/E: ×; others: ● [10, 33]
PC	●	NOP [32]	NOP [32]	NOP [32]	240D/E: ×; others: ● [33]
SV	● [12, 14]	NOP [32]	NOP [32]	NOP [32]	240D/E: ×; others: ● [33]
TR	● [35]	NOP [32]	NOP [32]	NOP [32]	240D/E: ×; others: ● [33, 36]

Dual Context Extension

Inst. or command	HP DesignJet Series	HP DraftMaster Series	HP Draft-Pro Plus	HP 7550 Plus	HP 7600 Series
FI	●	×	×	×	240D/E: ×; others: ●
FN	●	×	×	×	240D/E: ×; others: ●
SB	●	×	×	×	240D/E: ×; others: ●
ESC%#A	●	×	×	×	240D/E: ×; others: ●
ESCE	●	×	×	×	240D/E: ×; others: ●

Digitizing Extension

Inst.	HP DesignJet Series	HP DraftMaster Series	HP Draft-Pro Plus	HP 7550 Plus	HP 7600 Series
DC	×	●	●	●	×
DP	×	●	●	●	×
OD	×	● [1]	● [1]	● [1]	×

Advanced Drawing Extension

Inst.	HP DesignJet Series	HP DraftMaster Series	HP Draft-Pro Plus	HP 7550 Plus	HP 7600 Series
BR	Original DesignJet: ×; others: ● [1]	×	×	×	×
BZ	Original DesignJet: ×; others: ● [1]	×	×	×	×
MC	Original DesignJet: ×; others: ●	×	×	×	×
PP	Original DesignJet: ×; others: ●	×	×	×	×

Advanced Text Extension

Inst.	HP DesignJet Series	HP DraftMaster Series	HP Draft-Pro Plus	HP 7550 Plus	HP 7600 Series
LM	●	×	×	×	×
SB	●	×	×	×	×

Notes for the Tables of HP-GL/2 Instructions

- 1 X-coordinate, Y-coordinate, and radius ranges are:
 - integer and real: -2^{23} to $2^{23}-1$
 - clamped integer and real: -2^{15} to $2^{15}-1$; this range also applies to the number of fractional binary bits in the PE instruction, and to internally held coordinates.“Current units” means *integer* if scaling is off, *real* if scaling is on.
- 2 X-coordinate, Y-coordinate, and radius ranges are:
 - integer and real: -2^{26} to $2^{26}-1$
 - clamped integer and real: -2^{15} to $2^{15}-1$; this range also applies to the number of fractional binary bits in the PE instruction, and to internally held coordinates.“Current units” means *integer* if scaling is off, *real* if scaling is on.
- 3 Since roll media is not supported on this plotter, PG indicates the end of the plot file; further plotter action depends on the front panel *Overlay* setting. If *Overlay* is off (default), the plotter prompts the user to load media. If *Overlay* is on, the plotter is ready to plot the next file.
- 4 To ensure that a program using the RP (Replot) instruction works identically on all devices, begin each plot with a BP instruction followed by an IN instruction.
- 5 There is no limit to the number of replots, provided that no new plot is loaded that deletes the old one. Note that if a device enters “superflow” mode, this effectively deletes the old plot thereby preventing any replotting.
- 6 If an RP (Replot) instruction is received after a PG (Advance Full Page) instruction and with no intervening BP (Begin Plot), both the previous and the new pictures are plotted again.
- 7 The RP (Replot) instruction cannot be used when the data contains an HP RTL Simple Color command with a parameter value of -4 (**ESC*r-4U**).
- 8 RP (Replot) resends the entire stream of HP-GL/2 data which is saved in a replot buffer or on an internal disk. The plotter does not save a copy of the entire graphics state of the firmware at the beginning of the plot; therefore there is the possibility that the state of the plotter at the end of the plot adversely affects the beginning of the replot. For example, if the line type was 1 at the start of the plot and 3 at the end of the plot, and the plot opens with a pen down sequence of coordinates, then those lines will be drawn with a line type 3 instead of 1 when the picture is replotted.
- 9 Default chord angle is 5° .
- 10 256 pens are supported.
- 11 32 pens are supported.
- 12 For the HP DesignJet 700, 750C, 750C Plus, 755CM, 2000CP and 2500CP printing at 600 dots per inch, the line width increments at 600 dpi. At this resolution, these devices have a finer granularity for defining the line widths of vectors and stick fonts (see the table on page 23). The benefit is most noticeable on the thinnest lines. Related instructions are:
 - AC (Anchor Corner), defines pattern reference point.

- AD (Alternate Font Definition), where the line width in stick fonts depends on the stroke weight, pitch, and height.
- CF (Character Fill Mode), character filling uses the selected pattern.
- FP (Fill Polygon), fills a polygon with the selected pattern.
- FT (Fill Type), when selecting a user-defined pattern.
- PW (Pen Width), defining the line width of the vectors or stick fonts when the stroke weight is 9999.
- RA (Fill Rectangle Absolute), fills a rectangle with the selected pattern.
- RF (Raster Fill Definition), where additional width and height values of 128 allow the use of patterns at a resolution of 600 dots per inch.
- RR (Fill Rectangle Relative), fills a rectangle with the selected pattern.
- SD (Standard Font Definition), where the line width in stick fonts depends on the stroke weight, pitch, and height.
- SI (Absolute Character Size). Scaling stick fonts modifies also their line width, when the stroke weight is not 9999.
- SR (Relative Character Size). Defines the line width for stick fonts as a percentage of the distance between P1 and P2. Related commands that modify the distance between P1 and P2 are: IP, IR, PS, IN and BP.
- SV (Screened Vectors) in the Palette extension, fills vectors, arcs, and other entities with the selected pattern.
- WG (Fill Wedge), fill a wedge with the selected pattern.
- WU (Pen Width Unit Selection). When relative mode is used, the pen width is a percentage of the distance between P1 and P2. Related commands that modify the distance between P1 and P2 are IP, IR, PS, IN, and BP.

For these devices, if the `@PJL SET RESOLUTION` command specifies 600 dpi, halftoning is at 600 dpi with higher quality than at 300 dpi.

- 13 When applying a pattern imported from HP RTL, the plotter uses the current Anchor Corner position rather than the HP RTL Pattern Reference Point.
- 14 HP DesignJets 230, 250C, 330, 350C, 430, 450C, 455CA, 700, 750C, 750C Plus, 755CM, 2000CP and 2500CP also support fill types 21 and 22 when patterns are exported from HP RTL to HP-GL/2.
- 15 NOP'd (see page 16) when the *option1* parameter is set to a user-defined fill type.
- 16 Fill type 10 (shading) is interpreted as cross-hatching, the spacing of the lines being determined by the value for option1 (shading level). Fill type 11 is ignored.
- 17 Lines with a width of 35 mm or less always have butt caps and no join, regardless of the current attribute setting.

18 Line-width mapping. The following table shows the correspondence between the line width, as set using the PW instruction, and the pixels at various device resolutions.

HP-GL/2 pen width (mm)	All HP DesignJet devices: pixels at 300 dpi	Other HP DesignJet devices*: pixels at 600 dpi (addressable, black)	HP DesignJet 750C Plus and 755CM (model B): pixels at 600 dpi (addressable, color)	HP DesignJet 700, 750C Plus and 755CM: pixels at 600 dpi (real, black)	HP DesignJet 2000CP and 2500CP: pixels at 600 dpi (real, color)
0.10	1	1	1	1	1
0.14	1	1	1	2	2
0.18	2	3	2	3	3
0.22	2	3	3	4	4
0.26	3	5	4	5	5
0.31	3	5	5	6	6
0.35	4	7	6	7	7
0.39	4	7	7	8	8
0.43	5	9	8	9	9
0.48	5	9	9	10	10
0.52	6	11	10	11	11
and so on	...	...	...	...	...

* Devices, except those listed in other columns, that support this resolution.

- 19 Lines wider than the physical pen width can be drawn by using multiple strokes.
- 20 The range of the index number is 1 to 16.
- 21 Effectively NOP'd (see page 16) by defaulting the fill to a hatch pattern that approximates the fill density.
- 22 Interpreted as cross-hatching, the density of which approximates the density of the expected raster fill.
- 23 The default standard and alternate fonts are both Roman-8 (character set 0).
- 24 HP RTL patterns are supported using fill modes 2 and 3, which apply the current fill type from the FT command, when patterns are exported from HP RTL to HP-GL/2.
- 25 The HP DesignJet series plotters and printers support CF for stick fonts, but only to apply solid, shaded, or raster fills, not edging or hatching.
- 26 CF (Character Fill) is NOP'd (see page 16) if there are no outline fonts.
- 27 Acts as PG.
- 28 MT (Media Type) automatically adjusts pen speed (and possibly force) for various media, and switches between bidirectional and unidirectional stroking of wide lines and solid polygon fill (unidirectional is used when the media is set to "transparency" or any other type where stroking direction is found to make a visible difference).
- 29 Takes effect when front-panel *Drawing Quality* is set to "Custom". A quality level setting within the range 0 to 33 sets the pen speed to 110 cm/s and is equivalent to *draft* mode; 34 to 66 sets the pen

speed to 50 cm/s; 67 to 100 sets the pen speed to 30 cm/s and is equivalent to *quality* mode.

- 30 The pen speed is affected by the QL (Quality Level) and Carousel setting. The functional range is 1 to 110 cm/s.
- 31 The functional range is 1 to 110 cm/s.
- 32 Instruction is NOP'd (see page 16); the device defaults to the current pen color.
- 33 The HP 7600 Series models 250 and 255 are monochrome devices that can display colors as variations in gray scale.
- 34 The default value is 2 for monochrome devices or for color devices where GRAYSCALE or MONOCHROME is set from the front panel, using the setup sheet, or through PJJ; otherwise the default is 8.
- 35 Using this command with the HP DesignJet, DesignJet 200, 220, 600, and 650C (C2858A and C2859A) plotters also sets Source Transparency Mode (in HP RTL) to the same condition. The HP DesignJet 230, 250C, 330, 350C, 430, 450C, 455CA, 650C (C2858B and C2859B), 700, 750C, 750C Plus, 755CM, 2000CP and 2500CP have an equivalent RTL command (Source Transparency Mode, **ESC*v#N**) which must be used for this function.
- 36 The TR (Transparency Mode) instruction does not NOP (see page 16) gracefully and is, therefore, not recommended for multiproduct drivers.

Pen Plotter Implementation

Raster devices typically have the greater range of functionality. Where possible, there has been an effort to make pen plotters approximate the functionality of a raster device. There are, then, some necessary differences in the way HP-GL/2 is implemented in pen plotters than in raster devices. These differences include the following:

- Fundamental differences due to technology.
- Character set implementation.
- Raster fill emulation.

Technology Differences

Fundamental differences in the implementation of HP-GL/2 on pen plotters includes the following:

- “Replace” or “opaque” functionality. Marks overlapping previous marks on the media do not replace the previous marks; the marks blend depending on the colors used.
- Wide-line restroking. Pen plotters emulate wide lines in much the same way as they fill polygons. Pen plotters use their knowledge of current pen width and type to determine how closely to space the strokes making up the wide line.

Character Sets

Refer to “Character Set Values” on page 26 for information about the character sets implemented in current HP-GL/2 peripherals. The following lists the typefaces appropriate for pen plotters. The *kind* value corresponds to the *kind* parameter in the AD and SD instructions.

Attribute	Kind	Value	Description
Typeface	7	48	fixed vector (default)
		49	drafting
		50	fixed arc

Raster Fill Emulation

Pen plotters produce fills of different densities by using hatch or crosshatch patterns, varying any combination of line spacing, line width, or line type.

HP-GL/2 Labels

The following table lists the font types supported by various HP-GL/2 devices.

Product	Font Types				
	Bitmap	Outline	Stick		
			Vector	Arc	Drafting
HP DesignJet Series			•	•	•
HP DraftMaster Series			•	•	•
HP DraftPro Plus			•	•	•
HP 7550 Plus			•	•	•
HP 7600 Series			•	•	•

Character Set Values

A full list of character set values is given in Appendix C of *The HP-GL/2 and HP RTL Reference Guide*. The character sets supported through the current HP-GL/2 peripherals are:

	Character set values												
	0	4	5	6	9	11	14	19	21	36	37	38	39
HP DesignJet Series	•	•	•	•	•	•	•	•	•	•	•	•	•
HP DraftMaster Series	•	•	•	•	•	•	•	•	•	•	•	•	•
HP DraftPro Plus	•	•	•	•	•	•	•	•	•	•	•	•	•
HP 7550 Plus	•	•	•	•	•	•	•	•	•	•	•	•	•
HP 7600 Series	•	•	•	•	•	•	•	•	•	•	•	•	•

	Character set values									
	43	83	85	115	147	267	277	531	563	595
HP DesignJet Series		•	•	•	•	(1)	•	•	•	•
HP DraftMaster Series	•	•	•	•	•	•	•	•	•	•
HP DraftPro Plus	•	•	•	•	•	•	•	•	•	•
HP 7550 Plus	•	•	•	•	•	•	•	•	•	•
HP 7600 Series	•	•	•	•	•	•	•	•	•	•

(1) Available on HP DesignJets 230, 250C, 330, 350C, 430, 450C, 455CA, 700, 750C, 750C Plus, 755CM, 2000CP and 2500CP.

A peripheral may support other character sets than those listed here. The character sets listed above reflect those that can be used within such a peripheral's HP-GL/2 mode.

For Japanese users of the HP DesignJet Series plotters, the plotter is shipped with the capability to produce Kanji characters.

Sets 0, 277 [8U] Roman-8 (default) This set consists of the ANSI US ASCII set and the Roman Extensions set combined. The most significant bit, value 128, is set to 1 for the Roman Extensions part.	Dec	32	48	64	80	96	112	
		Hex	2	3	4	5	6	7
	0	0		0	@	P	`	p
	1	1	!	1	A	Q	a	q
	2	2	"	2	B	R	b	r
	3	3	#	3	C	S	c	s
	4	4	\$	4	D	T	d	t
	5	5	%	5	E	U	e	u
	...	...	(and so on, as Set 21 on page 31)					
		Dec	160	176	192	208	224	240
		Hex	A	B	C	D	E	F
	0	0		-	â	Ã	Ä	Å
	1	1	À	Á	Â	Ë	Ä	Å
	2	2	Â	Á	Ë	Ø	ã	.
	3	3	È	É	Ê	Æ	Ð	µ
4	4	Ê	Ç	á	â	ð	¶	
5	5	Ë	ç	é	í	í	¾	
...	...	(and so on, as Set 5 on page 28)						

Set 4 [0D] Danish/Norwegian Version 1 (ISO 60)	Dec	32	48	64	80	96	112	
		Hex	2	3	4	5	6	7
	0	0		0	@	P	`	p
	1	1	!	1	A	Q	a	q
	2	2	"	2	B	R	b	r
	3	3	#	3	C	S	c	s
	4	4	\$	4	D	T	d	t
	5	5	%	5	E	U	e	u
	6	6	&	6	F	V	f	v
	7	7	'	7	G	W	g	w
	8	8	(	8	H	X	h	x
	9	9	)	9	I	Y	i	y
	10	A	*	:	J	Z	j	z
	11	B	+	;	K	Æ	k	æ
	12	C	,	<	L	Ø	l	ø
	13	D	-	=	M	Å	m	å
14	E	.	>	N	^	n	-	
15	F	/	?	O	_	o	-	

**Set 5 [0E]
Roman Extensions**

Dec		32	48	64	80	96	112
	Hex	2	3	4	5	6	7
0	0		̄	â	À	Á	þ
1	1	À	Ý	ê	î	Ã	þ
2	2	Â	ý	ô	Ø	ã	·
3	3	È	°	û	Æ	Ð	µ
4	4	Ê	Ç	á	å	ð	¶
5	5	Ë	ç	é	í	í	¾
6	6	Î	Ñ	ó	ø	ì	—
7	7	Ï	ñ	ú	æ	Ó	¼
8	8	’	ı	à	Ä	Ò	½
9	9	˘	ı	è	İ	Õ	a
10	A	^	ı	ò	Ö	õ	°
11	B	”	£	ù	Ü	ş	«
12	C	~	¥	ä	É	ş	□
13	D	Ù	§	ë	İ	Ú	»
14	E	Û	f	ö	ß	ÿ	±
15	F	£	¢	ü	Ô	ÿ	

**Set 6 [0F]
French Version 1
(ISO 25)**

Dec		32	48	64	80	96	112
	Hex	2	3	4	5	6	7
0	0		0	à	P	˘	p
1	1	!	1	A	Q	a	q
2	2	”	2	B	R	b	r
3	3	£	3	C	S	c	s
4	4	\$	4	D	T	d	t
5	5	%	5	E	U	e	u
6	6	&	6	F	V	f	v
7	7	’	7	G	W	g	w
8	8	(	8	H	X	h	x
9	9	)	9	I	Y	i	y
10	A	*	:	J	Z	j	z
11	B	+	;	K	°	k	é
12	C	,	<	L	ç	l	ù
13	D	-	=	M	§	m	è
14	E	.	>	N	^	n	”
15	F	/	?	O	_	o	

Set 9 [0I] Italian (ISO 15)	Dec	32	48	64	80	96	112
	Hex	2	3	4	5	6	7
	0	0		0	§	P	ù	p
1	1	!	1	A	Q	a	q
2	2	"	2	B	R	b	r
3	3	£	3	C	S	c	s
4	4	\$	4	D	T	d	t
5	5	%	5	E	U	e	u
6	6	&	6	F	V	f	v
7	7	'	7	G	W	g	w
8	8	(	8	H	X	h	x
9	9	)	9	I	Y	i	y
10	A	*	:	J	Z	j	z
11	B	+	;	K	°	k	à
12	C	,	<	L	ç	l	ò
13	D	-	=	M	é	m	è
14	E	.	>	N	^	n	ì
15	F	/	?	O	_	o	

Set 11 [0K] JIS ASCII (ISO 14)	Dec	32	48	64	80	96	112
	Hex	2	3	4	5	6	7
	0	0		0	@	P	`	p
1	1	!	1	A	Q	a	q
2	2	"	2	B	R	b	r
3	3	#	3	C	S	c	s
4	4	\$	4	D	T	d	t
5	5	%	5	E	U	e	u
6	6	&	6	F	V	f	v
7	7	'	7	G	W	g	w
8	8	(	8	H	X	h	x
9	9	)	9	I	Y	i	y
10	A	*	:	J	Z	j	z
11	B	+	;	K	[	k	{
12	C	,	<	L	¥	l	|
13	D	-	=	M	]	m	}
14	E	.	>	N	^	n	-
15	F	/	?	O	_	o	

Note: Set 267 [8K], Kana-8, is a combination of this JIS ASCII set and set 43 [1K], Katakana (ISO 13, not shown in this book); the Katakana part has the most significant bit, value 128, set to 1. (Compare the Roman-8 set described on page 27.)

**Set 14 [0N]
ECMA-94 Latin 1
(8-bit version; ISO 8859/1)**

Dec		32	48	64	80	96	112
	Hex	2	3	4	5	6	7
0	0		0	@	P	`	p
1	1	!	1	A	Q	a	q
2	2	"	2	B	R	b	r
3	3	#	3	C	S	c	s
4	4	\$	4	D	T	d	t
5	5	%	5	E	U	e	u
6	6	&	6	F	V	f	v
7	7	'	7	G	W	g	w
8	8	(	8	H	X	h	x
9	9	)	9	I	Y	i	y
10	A	*	:	J	Z	j	z
11	B	+	;	K	[	k	{
12	C	,	<	L	\	l	|
13	D	-	=	M	]	m	}
14	E	.	>	N	^	n	~
15	F	/	?	O	_	o	

**Set 19 [0S]
Swedish for Names
(ISO 11)**

Dec		32	48	64	80	96	112
	Hex	2	3	4	5	6	7
0	0		0	É	P	é	p
1	1	!	1	A	Q	a	q
2	2	"	2	B	R	b	r
3	3	#	3	C	S	c	s
4	4	¤	4	D	T	d	t
5	5	%	5	E	U	e	u
6	6	&	6	F	V	f	v
7	7	'	7	G	W	g	w
8	8	(	8	H	X	h	x
9	9	)	9	I	Y	i	y
10	A	*	:	J	Z	j	z
11	B	+	;	K	Ä	k	ä
12	C	,	<	L	Ö	l	ö
13	D	-	=	M	Å	m	å
14	E	.	>	N	Ü	n	ü
15	F	/	?	O	_	o	

**Set 21 [0U]
ANSI US ASCII
(ISO 6)**

Dec		32	48	64	80	96	112
	Hex	2	3	4	5	6	7
0	0		0	@	P	`	p
1	1	!	1	A	Q	a	q
2	2	"	2	B	R	b	r
3	3	#	3	C	S	c	s
4	4	\$	4	D	T	d	t
5	5	%	5	E	U	e	u
6	6	&	6	F	V	f	v
7	7	'	7	G	W	g	w
8	8	(	8	H	X	h	x
9	9	)	9	I	Y	i	y
10	A	*	:	J	Z	j	z
11	B	+	;	K	[	k	{
12	C	,	<	L	\	l	|
13	D	-	=	M	]	m	}
14	E	.	>	N	^	n	~
15	F	/	?	O	_	o	

**Set 36 [1D]
Norwegian Version 2
(ISO 61)**

Dec		32	48	64	80	96	112
	Hex	2	3	4	5	6	7
0	0		0	@	P	`	p
1	1	!	1	A	Q	a	q
2	2	"	2	B	R	b	r
3	3	§	3	C	S	c	s
4	4	\$	4	D	T	d	t
5	5	%	5	E	U	e	u
6	6	&	6	F	V	f	v
7	7	'	7	G	W	g	w
8	8	(	8	H	X	h	x
9	9	)	9	I	Y	i	y
10	A	*	:	J	Z	j	z
11	B	+	;	K	Æ	k	æ
12	C	,	<	L	Ø	l	ø
13	D	-	=	M	Å	m	å
14	E	.	>	N	^	n	|
15	F	/	?	O	_	o	

**Set 37 [1E]
United Kingdom
(ISO 4)**

Dec		32	48	64	80	96	112
	Hex	2	3	4	5	6	7
0	0		0	@	P	`	p
1	1	!	1	A	Q	a	q
2	2	"	2	B	R	b	r
3	3	£	3	C	S	c	s
4	4	\$	4	D	T	d	t
5	5	%	5	E	U	e	u
6	6	&	6	F	V	f	v
7	7	'	7	G	W	g	w
8	8	(	8	H	X	h	x
9	9	)	9	I	Y	i	y
10	A	*	:	J	Z	j	z
11	B	+	;	K	[	k	{
12	C	,	<	L	\	l	|
13	D	-	=	M	]	m	}
14	E	.	>	N	^	n	-
15	F	/	?	O	_	o	

**Set 38 [1F]
French Version 2
(ISO 69)**

Dec		32	48	64	80	96	112
	Hex	2	3	4	5	6	7
0	0		0	à	P	µ	p
1	1	!	1	A	Q	a	q
2	2	"	2	B	R	b	r
3	3	£	3	C	S	c	s
4	4	\$	4	D	T	d	t
5	5	%	5	E	U	e	u
6	6	&	6	F	V	f	v
7	7	'	7	G	W	g	w
8	8	(	8	H	X	h	x
9	9	)	9	I	Y	i	y
10	A	*	:	J	Z	j	z
11	B	+	;	K	°	k	é
12	C	,	<	L	ç	l	ù
13	D	-	=	M	§	m	è
14	E	.	>	N	^	n	"
15	F	/	?	O	_	o	

Set 39 [1G] German (ISO 21)		Dec	32	48	64	80	96	112
		Hex	2	3	4	5	6	7
0	0		0	§	P	`	p	
1	1		!	1	A	Q	a	q
2	2		"	2	B	R	b	r
3	3		#	3	C	S	c	s
4	4		\$	4	D	T	d	t
5	5		%	5	E	U	e	u
6	6		&	6	F	V	f	v
7	7		'	7	G	W	g	w
8	8		(	8	H	X	h	x
9	9		)	9	I	Y	i	y
10	A		*	:	J	Z	j	z
11	B		+	;	K	Ä	k	ä
12	C		,	<	L	Ö	l	ö
13	D		-	=	M	Ü	m	ü
14	E		.	>	N	^	n	ß
15	F		/	?	O	_	o	

Set 83 [2S] Spanish (ISO 17)		Dec	32	48	64	80	96	112
		Hex	2	3	4	5	6	7
0	0		0	§	P	`	p	
1	1		!	1	A	Q	a	q
2	2		"	2	B	R	b	r
3	3		£	3	C	S	c	s
4	4		\$	4	D	T	d	t
5	5		%	5	E	U	e	u
6	6		&	6	F	V	f	v
7	7		'	7	G	W	g	w
8	8		(	8	H	X	h	x
9	9		)	9	I	Y	i	y
10	A		*	:	J	Z	j	z
11	B		+	;	K	i	k	°
12	C		,	<	L	Ñ	l	ñ
13	D		-	=	M	¿	m	ç
14	E		.	>	N	^	n	~
15	F		/	?	O	_	o	

Set 85 [2U]
International Reference
Version
(ISO 2)

Dec		32	48	64	80	96	112
	Hex	2	3	4	5	6	7
0	0		0	@	P	`	p
1	1	!	1	A	Q	a	q
2	2	"	2	B	R	b	r
3	3	#	3	C	S	c	s
4	4	¤	4	D	T	d	t
5	5	%	5	E	U	e	u
6	6	&	6	F	V	f	v
7	7	'	7	G	W	g	w
8	8	(	8	H	X	h	x
9	9	)	9	I	Y	i	y
10	A	*	:	J	Z	j	z
11	B	+	;	K	[	k	{
12	C	,	<	L	\	l	|
13	D	-	=	M	]	m	}
14	E	.	>	N	^	n	-
15	F	/	?	O	_	o	

Set 115 [3S]
Swedish
(ISO 10)

Dec		32	48	64	80	96	112
	Hex	2	3	4	5	6	7
0	0		0	@	P	`	p
1	1	!	1	A	Q	a	q
2	2	"	2	B	R	b	r
3	3	#	3	C	S	c	s
4	4	¤	4	D	T	d	t
5	5	%	5	E	U	e	u
6	6	&	6	F	V	f	v
7	7	'	7	G	W	g	w
8	8	(	8	H	X	h	x
9	9	)	9	I	Y	i	y
10	A	*	:	J	Z	j	z
11	B	+	;	K	Ä	k	ä
12	C	,	<	L	Ö	l	ö
13	D	-	=	M	Å	m	å
14	E	.	>	N	^	n	-
15	F	/	?	O	_	o	

**Set 147 [4S]
Portuguese
(ISO 16)**

Dec	Hex						
	2	3	4	5	6	7	
0	0	0	§	P	`	p	
1	1	!	1	A	Q	q	
2	2	"	2	B	R	r	
3	3	#	3	C	S	s	
4	4	\$	4	D	T	t	
5	5	%	5	E	U	u	
6	6	&	6	F	V	v	
7	7	'	7	G	W	w	
8	8	(	8	H	X	x
9	9	)	9	I	Y	y
10	A	*	:	J	Z	z	
11	B	+	;	K	Ã	ã	
12	C	,	<	L	Ç	ç	
13	D	-	=	M	Õ	õ	
14	E	.	>	N	^	°	
15	F	/	?	O	_	o	

**Set563 [17S]
HP-GL Drafting**

Dec	Hex						
	2	3	4	5	6	7	
0	0	0	@	P	`	p	
1	1	!	1	A	Q	q	
2	2	"	2	B	R	r	
3	3	¢	3	C	S	s	
4	4	\$	4	D	T	t	
5	5	%	5	E	U	u	
6	6	&	6	F	V	v	
7	7	'	7	G	W	w	
8	8	(	8	H	X	x
9	9	)	9	I	Y	y
10	A	*	:	J	Z	z	
11	B	+	;	K	[	µ
12	C	,	<	L	Ø	°	
13	D	-	=	M]	∞	
14	E	.	>	N	⊥	~	
15	F	/	?	O	_	o	

**Set 595 [18S]
HP-GL Special Symbols**

Dec		32	48	64	80	96	112
	Hex	2	3	4	5	6	7
0	0		0	@	_	`	±
1	1	!	1	▣	'	∩	⊖
2	2	"	2	⊙	R	∪	→
3	3	#	3	△	S	∩	↑
4	4	\$	4	+	T	∩	←
5	5	%	5	×	U	'	↓
6	6	&	6	◇	V	≡	∫
7	7	'	7	⬆	W	≡	÷
8	8	(	8	⊗	X	≈	★
9	9	)	9	Z	Y	≈	▽
10	A	*	:	Y	Z	∠	°
11	B	+	;	⊗	[∠	{
12	C	,	<	*	\	≠	|
13	D	-	=	⊗]	△	}
14	E	.	>	|	^	∏	~
15	F	/	?	*	_	Σ	

HP RTL Comparison

HP RTL Overview

The following peripherals support HP RTL:

- HP DesignJet Series plotters and printers
- HP 7600 Series plotters (models 250, 255, 355).

Commands that are not supported by a particular device are parsed and ignored without any error indication; the device scans for the next escape character (**ESC**).

The following peripherals do not support HP RTL:

- All pen plotters
 - HP 7600 Series plotters (models 240D/E).
-

General Considerations for Drivers

Use of CAP Movement Commands

When the resolution is set to 600 dpi, all CAP movements that are specified in pixels are at that resolution.

Color and Monochrome Raster

The HP DesignJet 600 plotter does not grayscale color raster plots.

Merging Vector and Raster Data

For the HP DesignJet 200, 220, 600, and 650C plotters, you can merge vector and raster data as long as your vector and raster data take up less than the available memory. Although the vector data can be sent at any time, we strongly recommend you send all the vector data first in case you run out of memory and so that raster plotting can begin on-the-fly. In situations where the plotter runs out of memory during HP RTL, the image data will be printed as long as the CAP position does not move backwards with respect to the motion of the paper.

Merging HP-GL/2 and HP RTL data is **not supported** for KCMY data using the Simple Color (**ESC*r#U**) command.

The HP DesignJet 230, 250, 330, 350C, 700, 750C and 750C Plus plotters and 430, 450C, 455CA, 755CM, 2000CP and 2500CP printers use an improved algorithm for solving memory overflow problems. Consider using the HP-GL/2 Frame Advance (FR) command in conjunction with this new algorithm, to divide large plots into suitable bands, and send them in order to the device.

When Overflow Occurs

On-the-Fly Plotting applies to the following devices: HP DesignJet 200, 220, 600, and 650C Plotters.

“Superflow” mode applies to the following devices: HP DesignJet 230, 250C, 330, 350C, 700, 750C and 750C Plus Plotters, and 430, 450C, 455CA, 755CM, 2000CP and 2500CP Printers.

Plotting Area

For the HP DesignJet 650C, unless set smaller by the front panel, the default plot size is 48 inches long by 36 inches wide for the E-size machine (C2859A/B) and 36 inches long and 24 inches wide on the D-size machine (C2858A/B). To make plots longer than these sizes it is necessary to set the plot size using the HP-GL/2 Page Size command (PS).

Selecting the Resolution

Consider supporting 300 dpi resolution, or 600 dpi for the HP DesignJet 700, 750C and 750C Plus plotters and 755CM, 2000CP and 2500CP printers.

You can control the resolution of images through the @PJM SET RESOLUTION command. This allows the selection of high-resolution plotting or printing on devices, like the HP DesignJet 700, 750C and 750C Plus plotters and 755CM, 2000CP and 2500CP printers, that support 600 dots per inch for monochrome or color output.

If the @PJM SET RESOLUTION command specifies 600 dots per inch, these devices have a finer granularity for defining raster images. To take full advantage of this mode, the data must be transferred at 600 dpi, using the **ESC*t600R** command.

For the HP DesignJet 700, 750C, 750C Plus and 755CM, if:

- no explicit resolution is set through PJL, and
- monochrome is set from the control-panel or from PJL, and
- the quality level is set to Best from the control-panel or using a “QL100” instruction in HP-GL/2,

then:

- vectors and polygons are rendered at 600 dpi, and
- raster fills, halftones and HP RTL images are rendered at 300 dpi.

For the HP DesignJet 2000CP and 2500CP, if no explicit resolution is set through PJL, and the quality level is set to Best from the control-panel or using a “QL100” instruction in HP-GL/2, then vectors and polygons are rendered at 600 dpi, and raster fills, halftones and HP RTL images are rendered at 300 dpi.

HP RTL Instructions

Context Switching

ESC&b#W	AppleTalk Configuration
ESC%#B	Enter HP-GL/2 Mode
ESC%#A	Enter RTL Mode/Enter PCL Mode
ESC%#X	Universal Exit Language/Start of PJJ
ESCE	Reset

HP DesignJet Series, and 7600 Series plotters

These devices do not allow the transferring of palettes between HP-GL/2 and HP RTL.

Defining an Image

ESC*t#v|V	Destination Raster Height
ESC*t#h|H	Destination Raster Width
ESC&a#h|H	Move CAP Horizontal (decipoints)
ESC*p#x|X	Move CAP Horizontal (HP RTL native resolution units)
ESC*p#y|Y	Move CAP Vertical (HP RTL native resolution units)
ESC&a#n|N	Negative Motion
ESC*b#l|L	Raster Line Path
ESC*t#r|R	Set Graphics Resolution
ESC*r#t|T	Source Raster Height
ESC*r#s|S	Source Raster Width
ESC*b#y|Y	Y Offset

HP DesignJet Series plotters and printers

When scaling down, the device uses a sampling technique to determine whether the scaled-down pixel will be set; the size of the sample is determined by the scale factor. Scaled-down rendering uses the Destination Raster Width and Destination Raster Height commands (see also the Start Raster Graphics command). The result of scaling down, when the original size is not a multiple of the scaled size, is not defined and such scaling should be avoided.

Sending a Negative Motion command with a value of 1 causes the plotter to enter on-the-fly plotting mode. The current raster image is plotted as it is received. If a command requesting negative motion is received while in this mode, the command is ignored, and the remaining data for the plot is discarded. For a discussion of On-the-Fly plotting, see page 38.)

When in raster mode and the Current Active Position (CAP) is moved with a Y Offset command, or when raster graphics mode ends, an incomplete row is zero-filled and rendered, and the row pointer is incremented.

Outside raster mode, the Move CAP Horizontal (decipoints) (**ESC&a#H**) and Y Offset (**ESC*b#Y**) commands are only supported for use with the HP DesignJet and HP DesignJet 600.

The Move CAP Horizontal (RTL Native Resolution Units) (**ESC*p#X**) and Move CAP Vertical (RTL Native Resolution Units) (**ESC*p#Y**) are recommended for use with the HP DesignJet 200 and HP DesignJet 650C and later plotters. The Move CAP Horizontal (decipoints) (**ESC&a#H**) command is to be made obsolete.

Source Raster Width: 0 to 65535 pixels.
Source Raster Height: 0 to 65535 pixel rows.

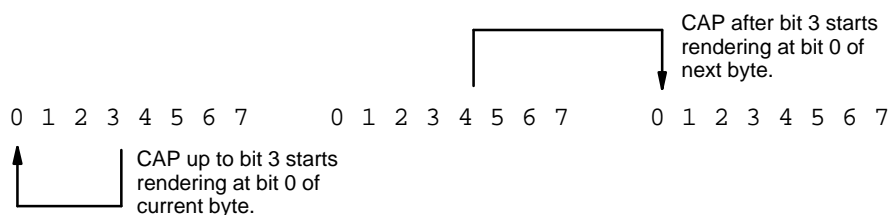
These plotters do not support reverse media movement. A negative Y Offset command is allowed as long as the device memory is not full (see on-the-fly plotting explanation on page 38).

The HP RTL native device resolution is 300 dots per inch (dpi) by default; in GRAYSCALE mode, the HP DesignJet 700, 750C, 750C Plus, 755CM, 2000CP, and 2500CP support 600 dpi (specified through the @PJL SET RESOLUTION command); in COLOR mode, the HP DesignJet 2000CP and 2500CP also support 600 dpi (through the @PJL SET RESOLUTION command). Continuous resolutions are not supported.

The HP DesignJet 200 plotter does not support an “Enhanced” quality level. The “Final” quality level of the HP DesignJet provides a resolution of 300 x 300 dpi. The HP DesignJet plotter supports draft resolutions of 75, 150, and 300 dpi. No draft resolutions are supported on the HP DesignJet 230, 250C, 330, 350C, 600, 700, 750C and 750C Plus plotters and 430, 450C, 455CA, 755CM, 2000CP and 2500CP printers.

Move CAP Horizontal (decipoints): **ESC&a#h|H**

- This command is to be made obsolete; use the Move CAP Horizontal (RTL native units) command, **ESC*p#x|X**, instead. (This command is supported by all plotters in the HP DesignJet series, except models C1633A and C1633B.)
- Rendering after one or more Move CAP Horizontal commands always begins on a byte boundary. (One byte corresponds to eight dots of the plotter’s physical resolution. Bytes are counted from the left edge of the plotter.) After one or more Move Horizontal CAP commands, the effective rendering position is rounded to determine which byte to start rendering on. If the series of Move CAP Horizontal commands places the CAP in bit positions 0, 1, 2, or 3, rendering starts at bit 0. If the series of Move CAP Horizontal commands places the CAP in bit positions 4, 5, 6, or 7, rendering begins at bit 0 of the next byte. Note that the CAP itself is not changed; this rounding operation only affects the place where the device starts rendering.



Note: The physical distance covered by a byte depends on each device’s physical resolution. For instance, at 300 dpi, there are $300/8 = 37.5$ bytes per inch, so each byte is $1/37.5 = .027$ inches wide.

Y Offset: **ESC*b#y|Y**

- This command is to be made obsolete *outside* raster mode; instead use the Move CAP Vertical (RTL native units) command, **ESC*p#y|Y**. The Y Offset command is still supported in raster mode, to skip rows by filling them with zeros. (This command is supported by all plotters in the HP DesignJet series, except models C1633A and C1633B.)

HP 7600 Series plotters (models 250, 255, 355)

When scaling down, the device takes the maximum of a set of pixels to determine whether the scaled-down pixel will be 0 or 1. The size of the set is determined by the scale factor. For example, when scaling to one-quarter the area size, a set would contain four pixels. The set 0100 would scale down to 1, the maximum. The set 0000 would scale down to 0. Scaled-down rendering uses the Destination Raster Width and Destination Raster Height commands (see also the Start Raster Graphics command). The result of scaling down, when the original size is not a multiple of the scaled size, is not defined and such scaling should be avoided.

Sending a Negative Motion command with a value of 1 causes the plotter to enter on-the-fly plotting mode. The current raster image is plotted as it is received. If a command requesting negative motion is received while in this mode, the command is ignored, and the remaining data for the plot is discarded. For a discussion of On-the-Fly plotting, see page 38.)

When the Current Active Position (CAP) is moved with a *Y Offset* command, or when raster graphics mode ends, an incomplete row is zero-filled and rendered, and the row pointer is incremented.

Source Raster Width: 0 to 14 336 pixels.
Source Raster Height: 0 to 65 535 pixel rows.

Reverse media movement is supported.

The physical device resolution is 406 dots per inch (dpi). “Native” resolutions are 102, 203, and 406 dpi. These plotters support continuous resolutions from 1 to 32 767 dpi, the allowable range. The default is 406 dpi. Out of range values are clamped. Draft resolutions of 102, 203, and 406 dpi are supported.

Defining Colors

ESC*v#i|I	Assign Color Index
ESC*v#W[data]	Configure Image Data
ESC*v#S	Set Foreground Color
ESC*p#P	Push/Pop Palette
ESC*t#|J	Render Algorithm
ESC*v#c|C	Set Blue Parameter
ESC*v#b|B	Set Green Parameter
ESC*v#a|A	Set Red Parameter
ESC*r#U	Simple Color

HP DesignJet Series plotters and printers

The HP DesignJet Series plotters, except the 600, can process color raster data and plot it as a gray scale raster image.

The HP DesignJet 600 plotter supports two-tone (black and white) monochrome only. Colors do not map to shades of gray. The commands for setting colors are not implemented.

For the HP DesignJet and HP DesignJet 600 no palette customization is supported.

Configure Image Data: **ESC*v#W[data]**

- The Configure Image Data command is supported by the HP DesignJet 200, 220, 230, 250C, 330, 350C, 430, 450C, 455CA, 650C, 700, 750C, 750C Plus, 755CM, 2000CP and 2500CP. You can optimize the file size of a monochrome image sent to an HP DesignJet series plotter or printer by transferring the raster information using the index-by-plane mode with one bit/pixel. Images sent in a direct-by-plane and direct-by-pixel (modes 2 and 3 of the Configure Image Data command) require color information, and this will not work *if only one plane of data is sent*. Pixel encoding modes 0 to 3 are supported; plane-by-plane encoding (mode 4) is not supported.
- The maximum number of bits per index is 8, and the maximum number of bits per primary is 8.
- The Configure Image Data command is not supported by the HP DesignJet and the HP DesignJet 600. All Configure Image Data defaults apply; normal encoding (mode 0) is supported.

Set Foreground Color: **ESC*v#S**

- The Set Foreground Color command sets the foreground color to the specified index of the current palette (#, default 0) – HP DesignJet 650C (models C2858B and C2859B), 220, 230, 250C, 330, 350C, 430, 450C, 455CA, 700, 750C, 750C Plus, 755CM, 2000CP and 2500CP. Along with the Source Transparency Mode (**ESC*v#n|N**) and Merge Control (MC) in HP-GL/2, this command is used in conjunction with the Logical Operation command (**ESC*#O**). The default foreground color is black, regardless of palette settings.

Render Algorithm: **ESC*t#J**

- Selects the algorithm to be used for rendering page marking entities on a given page. It allows the selection of a halftone algorithm, either Pattern or Scatter with the HP DesignJet 650C (models C2858B and C2859B) and allows the switching of halftone algorithms within a plot. The selected algorithm also applies to HP-GL/2.
- Range of the parameter – 0, 3, 5, 7, 8, 11, 12, 13, 14.
All these values are supported by the HP DesignJet 230, 250C, 330, 350C, 700, 750C and 750C Plus plotters, and 430, 450C, 455CA and 755CM printers; values 0, 5, 13 and 14 are supported by the HP DesignJet 2000CP and 2500CP printers; values 3 and 13 are supported by the HP DesignJet 650C plotters (models C2858B and C2859B). This command is not supported by other DesignJet plotters. The command is ignored for other values of the parameter.

Simple Color: **ESC*r#U**

- This command is supported by the HP DesignJet 230, 250C, 330, 350C, 430, 450C, 455CA, 650C (models C2858B and C2859B), 700, 750C, 750C Plus, 755CM, 2000CP and 2500CP only. The following parameter values are allowed:
 - 4 Four planes, device KCMY palette
 - 3 Three planes, device CMY palette.
- The HP-GL/2 RP (Replot) instruction cannot be used when the data contains a Simple Color command with a parameter value of –4 (**ESC*r–4U**).

HP 7600 Series plotters (models 250, 255, 355)

Models 250 and 255 support two-tone (black and white) monochrome only. Colors map to shades of gray. Model 355 supports four-color printing (black, cyan, magenta, and yellow).

The Set Foreground Color command is not supported.

The Configure Image Data command is supported.

- Allows 3 bits per index for a palette size of 8.
- From 0 to 15 bits per primary are allowed in the Configure Image Data command.
- Pixel encoding modes 0 (normal) and 4 (plane-by-plane) are supported.

Defining Patterns

ESC*v#t|T	Current Pattern
ESC*c#W[data]	Download Pattern
ESC*c#q|Q	Pattern Control
ESC*c#g|G	Pattern ID
ESC*p#r|R	Pattern Reference Point

HP DesignJet 230, 250C, 330, 350C, 700, 750C and 750C Plus plotters and **430, 450C, 455CA, 755CM, 2000CP and 2500CP** printers (other plotters in the **HP DesignJet** series do not support these commands)

Download Pattern: **ESC*c#W [pattern data]**

- The HP DesignJet 230, 250C, 330, and 350C plotters and 430, 450C and 455CA printers only support 300 dots per inch. The 700, 750C and 750C Plus plotters and the 755CM printer also support 600 dpi in GRAYSCALE mode. The 2000CP and 2500CP printers support 600 dpi in any mode.
- The HP DesignJet 230, 250C, 330, and 350C plotters and 430, 450C and 455CA printers do not support format 20 or 21 (see next). The 700, 750C and 750C Plus plotters and the 755CM printer do not support format 21.
- The HP DesignJet 2000CP and 2500CP printers also support format 21. This is similar to format 20, except that the pixel encoding byte can take the value 1 or 8 (with the same meaning as in format 1).
- Height in pixels and width in pixels fields: The HP DesignJet 230, 250C, 330, and 350C plotters and 430, 450C and 455CA printers support only 8, 16, 32, and 64 pixels. The HP DesignJet 700, 750C, 750C Plus plotters and 755CM printer support these values and 128 pixels in GRAYSCALE (600 dpi) mode. The 2000CP and 2500CP printers support these values and 128 pixels in any (600 dpi) mode.

Pattern Control: **ESC*c#q/Q**

- HP DesignJet 230, 250C, 330, 350C, 700, 750C and 750C Plus plotters and 430, 450C, 455CA, 755CM, 2000CP and 2500CP printers do not support permanent patterns.

Pattern Reference Point: **ESC*p#r/R**

- HP DesignJet 230, 250C, 330, 350C, 700, 750C and 750C Plus plotters and 430, 450C, 455CA, 755CM, 2000CP and 2500CP printers do not support pattern or print direction rotation; therefore there is no difference between the values 0 and 1.

Other HP DesignJet plotters and printers

These commands are not supported.

***Interactions between
Picture Elements***

ESC*!#O	Logical Operation (The group character in the command is a lowercase letter L, and the termination parameter character is an uppercase letter O.)
ESC*v#o|O	Pattern Transparency Mode (The termination parameter character is a letter O, upper- or lowercase.)
ESC*v#n|N	Source Transparency Mode

HP DesignJet, DesignJet 200, 220, 600, and 650C (models C2858A and C2859A)

When merge control and transparency mode are both off (MC0, TR0), the last rendered image overlaps previous images.

When either MC *or* TR is on (MC1 or TR1), the images intersect, the resulting interaction between the images will depend on the particular settings of these commands.

HP DesignJet 230, 250C, 330, 350C, 430, 450C, 455CA, 650C (models C2858B and C2859B), 700, 750C, 750C Plus, 755CM, 2000CP and 2500CP

When a raster image is rendered on top of previous images, the plotted image will depend on the settings of the MC and Source Transparency Mode commands. HP-GL/2 and HP RTL transparency settings are handled independently of each other.

- If MC is off (MC0) and Source Transparency Mode is set to 1, the last rendered image overlaps previous images.
- If Merge Control and Source Transparency Mode are set to any other combination, the resulting interaction between the images will depend on the particular settings of these commands.
- Except for the HP DesignJet 650C (models C2858B and C2859B), the Logical Operation command (**ESC*!#O**) is supported, with the same function as the MC instruction.

Source Transparency Mode: **ESC*v#N**

- This command is supported by these devices. Other devices in the DesignJet series use the HP-GL/2 TR instruction.

Transmitting Data

ESC*b#m|M	Compression Method
ESC*rC	End Raster Graphics
ESC*r#a|A	Start Raster Graphics
ESC*b#V[data]	Transfer Raster Data by Plane
ESC*b#W[data]	Transfer Raster Data by Row/Block

The following restrictions and considerations apply to the merging of data.

HP DesignJet 200, 220, 600 and 650C (models C2858A and C2859A) plotters

When merge control and transparency mode are both off (MC0, TR0), the last rendered image overlaps previous images.

When either MC *or* TR is on (MC1 or TR1), the images intersect, the resulting interaction between the images will depend on the particular settings of these commands.

HP DesignJet 230, 250C, 700, 750C and 750C Plus plotters, and 755CM, 2000CP and 2500CP printers

When a raster image is rendered on top of previous images, the plotted image will depend on the settings of the MC and Source Transparency Mode commands. HP-GL/2 and HP RTL transparency settings are handled independently of each other.

If MC is off (MC0) and Source Transparency Mode is set to 1, the last rendered image overlaps previous images.

If Merge Control and Source Transparency Mode are set to any other combination, the resulting interaction between the images will depend on the particular settings of these commands.

The Logical Operation command (**ESC*!#O**) is supported, with the same function as the MC instruction.

The merging of data is controlled by the HP-GL/2 MC (merge control) and TR (transparency mode) instructions and the HP RTL Logical Operation (**ESC*!#O**) command.

HP DesignJet 330 and 350C plotters and 430, 450C and 455CA printers

The merging of data is controlled by the HP-GL/2 MC (merge control) and TR (transparency mode) instructions and the HP RTL Logical Operation (**ESC*!#O**) command.

HP DesignJet 650C (models C2858B and C2859B) plotters

When a raster image is rendered on top of previous images, the plotted image will depend on the settings of the MC and Source Transparency Mode commands. HP-GL/2 and HP RTL transparency settings are handled independently of each other.

If MC is off (MC0) and Source Transparency Mode is set to 1, the last rendered image overlaps previous images.

If Merge Control and Source Transparency Mode are set to any other combination, the resulting interaction between the images will depend on the particular settings of these commands.

HP 7600 Series plotters (models 250, 255, 355)

All raster data overwrites any previous HP-GL/2 data and all areas not defined by black dots are treated as opaque white space. Subsequent HP-GL/2 data overwriting raster data is affected by the MC (merge control) and TR (transparency mode) commands.

Summary of the Commands Supported on HP DesignJet Plotters and Printers

The following table shows which plotters and printers support which RTL commands. There may be restrictions on the range of parameters supported or on the use of the command; see the detailed descriptions above for more information. (“DJ” signifies HP DesignJet.)

Command name	Escape sequence	DJ (1)	DJ 200	DJ 230, 250C	DJ 330, 350C, 430, 450C, 455CA	DJ 600	DJ 650C	DJ 700, 750C, 750C+, 755CM, 2000CP, 2500CP
AppleTalk Configuration	ESC&b#W[data]		✓	✓	✓		✓	✓
Assign Color Index	ESC*v#||		✓	✓	✓		✓	✓
Compression Method	ESC*b#m|M	✓	✓	✓	✓	✓	✓	✓
Configure Image Data	ESC*v#W[data]		✓	✓	✓		✓	✓
Current Pattern	ESC*v#t|T			✓	✓			✓
Destination Raster Height	ESC*t#v|V	✓	✓	✓	✓	✓	✓	✓
Destination Raster Width	ESC*t#h|H	✓	✓	✓	✓	✓	✓	✓
Download Pattern	ESC*c#W[data]			✓(2)	✓			✓
End Raster Graphics	ESC*rC	✓	✓	✓	✓	✓	✓	✓
Enter HP-GL/2 Mode	ESC%#B	✓	✓	✓	✓	✓	✓	✓
Enter RTL Mode	ESC%#A	✓	✓	✓	✓	✓	✓	✓
Foreground Color	ESC*v#s|S			✓	✓	✓	✓(3)	✓
Logical Operation	ESC*#O			✓	✓			✓
Move CAP Horiz. (decipits)	ESC&a#h|H	✓				✓		
Move CAP Horiz. (dots/in.)	ESC*p#x|X		✓	✓	✓		✓	✓
Move CAP Vert. (dots/inch)	ESC*p#y|Y		✓	✓	✓		✓	✓
Negative Motion	ESC&a#n|N	✓	✓	✓	✓	✓	✓	✓
Pattern Control	ESC*c#q|Q			✓	✓			✓
Pattern ID	ESC*c#g|G			✓	✓			✓
Pattern Reference Point	ESC*p#r|R			✓	✓			✓
Pattern Transparency	ESC*v#o|O			✓	✓			✓
Push/Pop Palette	ESC*p#P		✓	✓	✓		✓	✓
Raster Line Path	ESC*b#||L	✓	✓	✓	✓	✓	✓	✓
Render Algorithm	ESC*t#J			✓	✓		✓(3,4)	✓
Reset	ESCE	✓	✓	✓	✓	✓	✓	✓
Set Blue Parameter	ESC*v#c|C		✓	✓	✓		✓	✓
Set Graphics Resolution	ESC*t#r|R	✓	✓	✓	✓	✓	✓	✓
Set Green Parameter	ESC*v#b|B		✓	✓	✓		✓	✓
Set Red Parameter	ESC*v#a|A		✓	✓	✓		✓	✓
Simple Color	ESC*r#U			✓	✓		✓(3)	✓
Source Raster Height	ESC*r#t|T	✓	✓	✓	✓	✓	✓	✓
Source Raster Width	ESC*r#s|S	✓	✓	✓	✓	✓	✓	✓
Source Transparency	ESC*v#n|N			✓	✓		✓(3)	✓
Start Raster Graphics	ESC*r#a|A	✓	✓	✓	✓	✓	✓	✓
Transfer Raster by Plane	ESC*b#V[data]	✓	✓	✓	✓	✓	✓	✓
Transfer Raster, Row/Block	ESC*b#W[data]	✓	✓	✓	✓	✓	✓	✓
UEL/Start PJJ	ESC%-12345X	✓	✓	✓	✓	✓	✓	✓
Y Offset	ESC*b#y|Y	✓	✓	✓	✓	✓	✓	✓

- Notes:
- (1) The original DesignJet plotter
 - (2) Pattern types 0 and 1 only
 - (3) Models C2858B and C2859B only
 - (4) Algorithms 3 and 13 only.

PJL Comparison

PJL Commands

Some of the commands of the Printer Job Language (PJL) are supported by HP DesignJet plotters and printers, as indicated by a check mark (✓) in the tables on the next pages. Commands that are not listed are not supported on any HP DesignJet plotter or printer. See the *Printer Job Language Technical Reference Manual* for details of the full syntax of PJL.

PJL commands or variables in the @PJL SET command that are not supported by a device are ignored with no error indication.

Example:

```
ESC%-12345X@PJL JOB NAME = "... " CR LF
@PJL COMMENT HP DESIGNJET 750C PLUS CR LF
@PJL COMMENT ... PLOTTER USING HP-GL/2, CR LF
@PJL COMMENT ... MONOCHROME, 600dpi CR LF
@PJL SET RESOLUTION = 600 CR LF
@PJL SET RENDERMODE = GRAYSCALE CR LF
@PJL SET MIRROR = OFF CR LF
@PJL SET MARGINS = NORMAL CR LF
@PJL SET PALETTE SOURCE = SOFTWARE CR LF
@PJL SET PAPERLENGTH = 5958 CR LF
@PJL SET PAPERWIDTH = 8423 CR LF
@PJL SET ORIENTATION = PORTRAIT CR LF
@PJL SET PRINTAREA = FULLSIZE CR LF
@PJL SET RET = ON CR LF
@PJL ENTER LANGUAGE = HPGL2 CR LF
... (HP-GL/2 instructions) ...
ESC%-12345X@PJL EOJ NAME = "... " CR LF
```

(The symbols **ESC**, **CR** and **LF** denote the escape, carriage-return and line-feed control characters, respectively.)

Notes for the next table:

- (1) The @PJL INFO and @PJL USTATUSOFF commands are to be made obsolete; do not use them in new applications.
- (2) If this option in the table is not specified in a @PJL SET command, the default is to use the setting from the front panel of the device; the default value shown underlined in the table is the front panel default. (However, the front-panel default for PRINTAREA on non-supported devices is INKEDAREA.)

@PJL SET RET corresponds to the SHARP LINES front-panel option.
- (3) The POSTSCRIPT option is only accepted when the PostScript feature is installed.
- (4) The options supported are RET=OFF|ON only.
- (5) The only option supported is RESOLUTION=300.
- (6) @PJL SET PRINTAREA=FULLSIZE|INKEDAREA and @PJL SET RET=ON|OFF|AUTO are supported by the model C3198B only.

PJL Command	HP DesignJet Model					
	200	220	230	250C	330	350C
COMMENT	✓	✓	✓	✓	✓	✓
ECHO	✓	✓	✓	✓	✓	✓
ENTER LANGUAGE = HPGL HPGL2 POSTSCRIPT	✓ ✓ x	✓ ✓ x	✓ ✓ x	✓ ✓ x	✓ ✓ ✓(3)	✓ ✓ ✓(3)
EOJ [NAME="..."]	x	x	✓	✓	✓	✓
INFO CONFIG ⁽¹⁾ ID STATUS USTATUS	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓
JOB [NAME="..."]	x	x	✓	✓	✓	✓
RESET	x	x	✓	✓	✓	✓
SET MARGINS ⁽²⁾ = EXTENDED|NORMAL|SMALLER MIRROR ⁽²⁾ =OFF|ON ORIENTATION ⁽²⁾ =LANDSCAPE|PORTRAIT PALETTESOURCE= <u>DEVICE</u>|SOFTWARE PAPERLENGTH=value in decipoints PAPERWIDTH=value in decipoints (1/720-in.) PRINTAREA ⁽²⁾ =FULLSIZE|INKEDAREA RENDERMODE ⁽²⁾ =COLOR|GRAYSCALE RESOLUTION=300|600 RET ⁽²⁾ =AUTO|OFF|ON	x x x x x x x x x x x	x x x x x x x x x x x	x ✓ ✓ ✓ ✓ x x x x x x	x ✓ ✓ ✓ ✓ x x ✓(5) x x x	x ✓ ✓ ✓ ✓ x x ✓(5) x x ✓(4)	x ✓ ✓ ✓ ✓ x x ✓(5) x x ✓(4)
ESC%-12345X (universal exit language)	✓	✓	✓	✓	✓	✓
USTATUS DEVICE=value TIMED=value	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓
USTATUSOFF ⁽¹⁾	✓	✓	✓	✓	✓	✓

PJL Command	HP DesignJet Model				
	430	450C	455CA	600	650C
COMMENT	✓	✓	✓	✓	✓
ECHO	✓	✓	✓	✓	✓
ENTER LANGUAGE = HPGL HPGL2 POSTSCRIPT	✓ ✓ x	✓ ✓ x	✓ ✓ x	✓ ✓ x	✓ ✓ ✓(3)
EOJ [NAME="..."]	✓	✓	✓	x	x
INFO CONFIG ⁽¹⁾ ID STATUS USTATUS	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	x x x ✓	x x x ✓
JOB [NAME="..."]	✓	✓	✓	x	x
RESET	✓	✓	✓	x	x
SET MARGINS ⁽²⁾ = EXTENDED|NORMAL|SMALLER MIRROR ⁽²⁾ =OFF|ON ORIENTATION ⁽²⁾ =LANDSCAPE|PORTRAIT PALETTESOURCE= <u>DEVICE</u>|SOFTWARE PAPERLENGTH=value in decipoints PAPERWIDTH=value in decipoints (1/720-in.) PRINTAREA ⁽²⁾ =FULLSIZE|INKEDAREA RENDERMODE ⁽²⁾ =COLOR|GRAYSCALE RESOLUTION=300|600 RET ⁽²⁾ =AUTO|OFF|ON	x ✓ ✓ ✓ ✓ ✓ x ✓(5) ✓(4)	x ✓ ✓ ✓ ✓ ✓ x ✓(5) ✓(4)	x ✓ ✓ ✓ ✓ ✓ x ✓(5) ✓(4)	x x x x x x x x x	x x x x x x x x x

PJL Command	HP DesignJet Model				
	430	450C	455CA	600	650C
ESC%-12345X (universal exit language)	✓	✓	✓	✓	✓
USTATUS DEVICE=value TIMED=value	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓
USTATUSOFF ⁽¹⁾	✓	✓	✓	✓	✓

PJL Command	HP DesignJet Model					
	700	750C	750C Plus	755CM	2000CP	2500CP
COMMENT	✓	✓	✓	✓	✓	✓
ECHO	✓	✓	✓	✓	✓	✓
ENTER LANGUAGE = HPGL HPGL2 POSTSCRIPT	✓ ✓ ✓ ⁽³⁾	✓ ✓ ✓ ⁽³⁾	✓ ✓ ✓ ⁽³⁾	✓ ✓ ✓	× × ×	× ✓ ✓
EOJ [NAME="..."]	✓	✓	✓	✓	✓	✓
INFO CONFIG ⁽¹⁾ ID STATUS USTATUS	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓
JOB [NAME="..."]	✓	✓	✓	✓	✓	✓
RESET	✓	✓	✓	✓	✓	✓
SET MARGINS ⁽²⁾ =NORMAL|SMALLER MARGINS ⁽²⁾ = EXTENDED|NORMAL|SMALLER MIRROR ⁽²⁾ =OFF|ON ORIENTATION ⁽²⁾ =LANDSCAPE|PORTRAIT PALETTESOURCE=DEVICE|SOFTWARE PAPERLENGTH=value in decipoints PAPERWIDTH=value in decipoints (1/720-in.) PRINTAREA ⁽²⁾ =FULLSIZE|INKEDAREA RENDERMODE ⁽²⁾ =COLOR|GRAYSCALE RESOLUTION=300|600 RET ⁽²⁾ =AUTO|OFF|ON	✓ × ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ × ✓ ×	✓ × ✓ ✓ ✓ ✓ × ✓ ✓ ✓ ✓ ×	✓ × ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ × ✓ ✓ ✓ ✓ ✓ ⁽⁶⁾ ✓ ✓ ✓ ⁽⁶⁾	× ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ×	× ✓ ✓ ✓ ✓ ✓ ✓ ✓ ×
ESC%-12345X (universal exit language)	✓	✓	✓	✓	✓	✓
USTATUS DEVICE=value TIMED=value	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓
USTATUSOFF ⁽¹⁾	✓	✓	✓	✓	✓	✓

(1), (2), (3), (4), (5), (6): See the notes on page 52.

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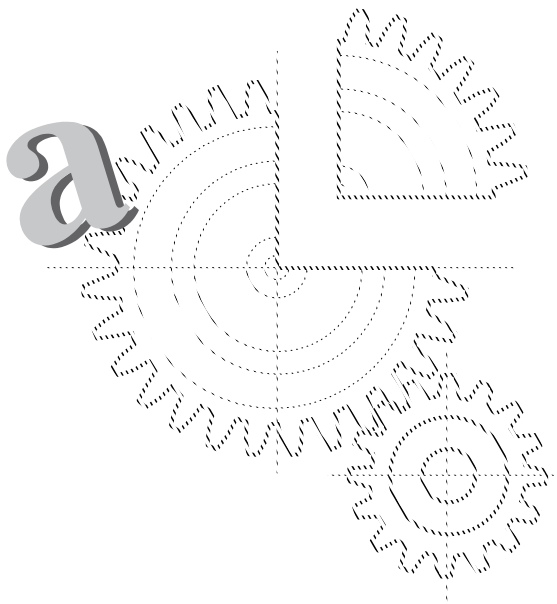
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