Océ Power Print Controller

PCL5e Reference Guide

Océ-Technologies B.V.

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Chapter 1
Introduction

This chapter defines the readers to who this PCL5e Reference Guide is intended. It also gives general information about the structure of this PCL5e Reference Guide and how to use it.

For who is this Reference Guide intended?

This Reference Guide is not the user manual of the Océ Power Print Controller. It is meant to be a reference for configuring and programming the Océ Power Print Controller printer using PCL commands.

End users and Key Operators

This Reference Guide is not intended for end users of the Océ Power Print Controller printer. End users will only access the printer through the print menu of the application they print from, possibly in conjunction with a Printer Control Interface from Océ. Therefore, end users should refer to the documentation of the application, or the platform, they wish to print from.

Key Operators, responsible for advanced functions from the printer's operator panel and for day-to-day maintenance and troubleshooting on the printer will find all information they need in the System Operation Manual and the Océ Power Print Controller System Administration Manual which are supplied with the printer.

Programmers

This Reference Guide is only intended for skilled personnel, such as:

- application developers who wish to write drivers to enable users to print to the Océ Power Print Controller printer from within their application
- system integrators
- Océ system consultants.

Structure of this PCL5e Reference Guide

This PCL5e Reference Guide is divided into 3 chapters.

Overview of chapters

chapter 2, ‘PCL implementation’ on page 13 This chapter briefly explains how you can use PCL5e to control your printer.

chapter 3, ‘PCL5e commands overview’ on page 51 This chapter gives an overview of the supported PCL5e commands.

Additional documentation

Additional PCL documentation

This PCL5e Reference Guide only describes the basics and the implementation in the Océ Power Print Controller of the PCL5 language. The PCL5 language is fully documented in the following publications:

- *PCL5 Printer Language Technical Reference Manual* available from Hewlett-Packard. The HP order number: 33491-90952.
- *Printer Job Language Technical Reference Manual*, edition 9.0 available from Hewlett-Packard. The HP order number: 5021-0328.

Additional Océ printer documentation

- The Océ 8400 Series System Administration Manual describes the advanced user settings of the Océ 8400 Series. This manual is supplied with the printer.
- The Océ 9200 Series System Administration Manual describes the advanced user settings of the Océ 9200 Series. This manual is supplied with the printer.
- The Océ 9200 Series GUI Reference Guide provides information on the Graphical User Interface of the Océ 9200 Series and its functionality.
- The Océ Power Print Controller Technical Reference Manual contains all information for configuration and programming the printer.

All above Océ manuals are available in PDF format on the Océ Power Print Controller User Documentation CD-ROM.

User interfaces

The Océ Power Print Controller of the Océ 8400 Series basically has two points of user interaction. Therefore, it is important for you to understand which point of user interaction is required for performing a specific task or function.

Normal operational user interaction will go through the operating panel of the printer engine. This is described in the System Operation Manual of your printer. The control panel can be used for actions that relate to the engine as well as the recovery of errors that relate to the engine (e.g. paper jam handling). The following modes of operation are distinguished: Normal User mode and E-KOS mode.

In order to change the controller system settings (C-KOS) you need a terminal connection to the controller of the printer. There are two ways of establishing this connection:
- connect a VT100 terminal directly to serial port B of the controller,
- set up a Telnet session via the Ethernet connection of the controller.

The Océ 9200 Series has one KOS. All user interaction will go through:
- the one-line console of the engine of the printer
- a terminal connection to the controller of the printer
- or the optional Graphical User Interface (GUI).

For more information on (C-)KOS, refer to the System Administration Manual of your printer.

Chapter 2
PCL implementation

This chapter documents the PCL implementation in the Océ Power Print Controller. Besides a brief introduction into the HP PCL5e page description language, it elaborates on the differences between and the functionality of PCL and HP-GL/2. Further, PJL Parsing is described.

PCL implementation in the Océ Power Print Controller

The Océ Power Print Controller supports the PCL5e Page Description Language. PCL5e also knows the following subsets:

- Printer Job Language (PJL): this feature allows you to set different/partly processing features of PCL5.
- HP-GL/2: this is the Hewlett Packard graphical language.

Printing files using the PCL PDL

If you wish to print files using the PCL PDL, select the PCL5e driver from the application that generates the print files, or from the platform, e.g. from the Windows Control Panel.

Printer commands

There are four general types of PCL5 printer commands:

Control codes These codes initiate a printer function. Control codes are composed of a single character with an ASCII decimal value of less than 32. The printer reads a control character as a command to be performed and not as data to be printed. An important control code is Escape (<ESC>, decimal value = 27, hex value = 1B) — indicating the beginning of an escape sequence. It identifies the string of characters in an escape sequence as a printer command. For an overview of the control codes, refer to ‘Control codes’ on page 52.

PCL commands These commands provide access to the printer’s PCL mode. For an overview of the PCL commands, refer to ‘PCL command overview’ on page 53.

PJL commands The HP Printer Job Language (PJL) offers you more control over your print jobs and provides for status feedback information. For more information on PJL, refer to chapter , ‘PJL support’ on page 34. For an overview of the PJL commands, refer to ‘PJL command groups’ on page 70.

HP-GL/2 commands These commands define the print image and allow you to exit from and return to the PCL mode. For an overview of the HP-GL/2 commands, refer to ‘HP-GL/2 commands’ on page 73.

HP PCL5 emulation

PCL compatibility reference

In the HP PCL5 emulation, the compatibility reference for the Océ Power Print Controller is the HP 5Si. Except for the default symbol set, described on page 29, the HP 5Si is upwards compatible from the HP 4Si.

Note: *Mind that the HP PCL5 emulation supports most, but not all HP 5Si commands and that additional Océ functionality is added to the HP PCL5 emulation. A complete list of the supported PCL commands is given on page page 53.*

Entering PCL5 emulation

You may enter PCL5 emulation by using the EMULATION identification attribute in the job ticket using Job Automation Control (JAC). For more information on job tickets and processing attributes, see the chapter 'Job ticket mechanism' in the Océ Power Print Controller Technical Reference Manual.

PCL print quality parameters

You can alter the following print quality parameters using C-KOS:

1. Font smoothing (on/off)
2. Bitmap font fattening (on/off)
3. Raster fattening (on/off)
4. Line fattening (on/off)
5. Single scan raster fattening (on/off).

The following print quality parameters can be altered by your local System Consultant:

1. HPGL line art fattening (fraction of minimal line width, real number)
2. User defined fill pattern fattening (on/off)
3. Outline font fattening (in pixels, real number)
4. Minimum line width (in number of pixels).

Furthermore, besides the default HP grey patterns, Océ optimized grey patterns are provided, with a wider range of gray values than the standard 7 HP values. The selection for using HP or Océ grey patterns can be made by your System Consultant.

Paper size and paper source selection

The PCL5 PDL supports paper size selection using the 'ESC&l#A' sequence. This implies automatically selecting a tray, which contains the requested paper size.

Paper source selection is supported using the 'ESC&l#H' sequence. The following rules apply to paper source selection:

- If the requested paper size is not present in any of the input trays, then the job is interpreted on the requested size, but printed on the paper size that is in the selected paper source. This means that you are not asked to put the requested paper size in an input tray.
- It is still possible to explicitly select an input tray, by selecting the paper source. This has no effect on the current paper size within the job.
- If the paper size of the requested paper source conflicts with the current paper size (either the KOS default or the paper size in the job), then the paper source request is dropped.

Note: *The requested paper size or paper source can be overruled by higher priority mechanisms like JAC.*

If a paper size, which is not listed in table 16 on page 57, or table 17 on page 58, is selected using the paper size escape code 'ESC&l#A', then:

- the paper size, present in the bulk tray will be selected on the Océ 8400.
- the paper size present in the lower tray will be selected on the Océ 9200 series.

Job separation handling

At the end of a job (file), the delivery-mode is specified. The delivery-mode depends on the following settings:

- Stacker-Stapler (Océ 9200 Series), jogging and stapling are enabled or disabled
- Sorter, document separation is enabled or disabled
- JAC Job Separation is set to on or off
- PCL5 job separation command
- PJL finish and job offset environment settings
- PCL5 default jogging is set to on or off
- PCL5 default stapling is set to on or off.

For more information on these settings and how to change them, refer to the System Operation Manual and System Administration Manual.

PCL commands

PCL commands are referred to as escape sequences that consist of two or more characters and usually start with the escape character. Escape sequences tell the printer what actions to perform.

For an overview of the supported PCL commands, see ‘PCL command overview’ on page 53.

Escape sequence syntax

There are two kinds of escape sequences:

Two-character escape sequences

Syntax: <ESC>P

in which P defines the operation to be performed and terminates the escape sequence. It is any character between ‘0’ and ‘~’ (decimal 48 to 126, hexadecimal 30 to 7E).

Parameterised escape sequence

Syntax: <ESC>P[g#p1#p2#p3...#T[data]]

- *P* represents a parameterised escape sequence. The parameters must be included because they further define the action to be performed.
- *g* is the group character. It defines the group type of control being performed and is used with commands that require additional parameters.
- *#* stands for the value field and specifies a numeric value between -32768 and 32768 (default value is 0).
- *p1p2p3...* is the parameter character. It defines the parameter to which the previous value field applies, and it indicates that more parameters follow.
- *T* is the termination. It specifies the parameter to which the value field applies and terminates the escape sequence.
- When data is required by the command, the value field indicates the number of bytes of 8-bit binary data to be sent to the printer. The *[data]* immediately follows the terminating character of the escape sequence.

Note: *Groups of similar escape sequences — i.e. escape sequences that have the same first two characters — can be combined into a single escape sequence.*

Entering PCL mode

Upon entering PCL5 emulation, you automatically enter the PCL mode.

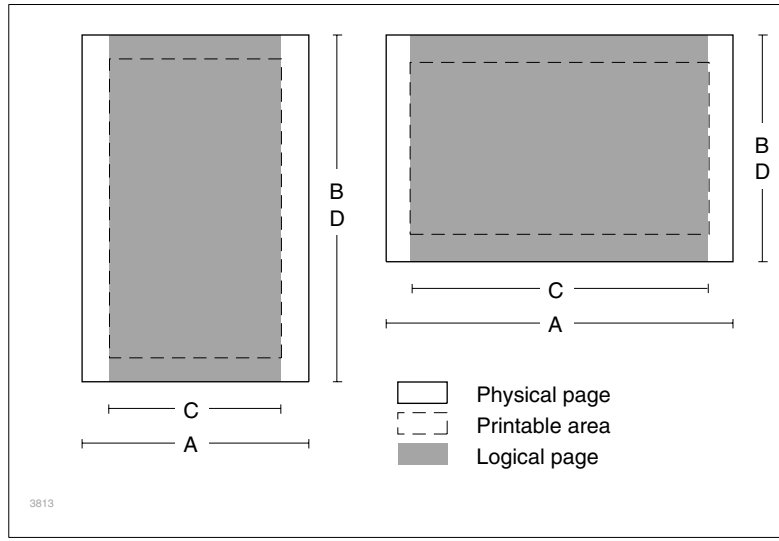
Describing the page in PCL

Logical page

The PCL logical page is the area of the physical page in which the cursor can be positioned. The cursor refers to the location on the page where the next character is to be positioned. The cursor is positioned using the cursor positioning commands and control codes.

In the figure below:

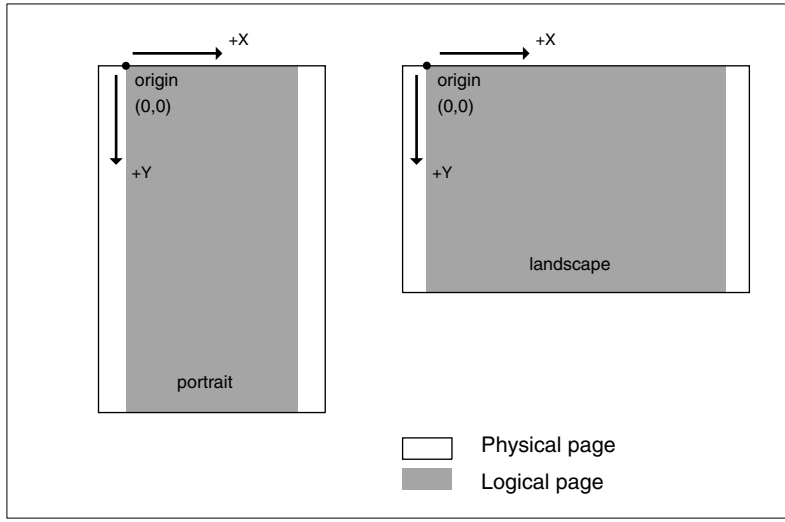
- A = the physical page width
- B = the physical page length
- C = the logical page width
- D = the maximum logical page length.



[1] Portrait and landscape page boundaries: logical page

Coordinate system for escape sequences

In order to correctly position a printable character on a page, PCL uses a system of coordinates. The origin is the upper left corner of the logical page. All movements and positioning commands are taken with respect to this origin. X coordinates run from left to right and Y coordinates run from the top downwards.



[2] PCL coordinates

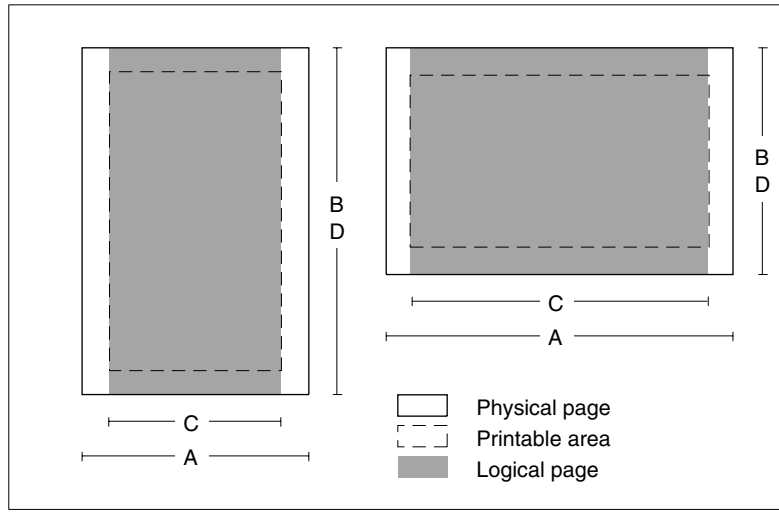
The point (0,0) in the X,Y PCL coordinate system is defined at the left edge of the logical page at the current top margin position. Since the top margin can be modified using a printer command, the physical location of the point (0,0) may change.

PCL Printable area

The printable area is the area of the physical page where the printer can place a dot. If the page size is not properly assigned, data may be lost because the printer is instructed to print beyond the edge of the logical page.

In the figure:

- A = the physical page width
- B = the physical page length
- C = the logical page width
- D = the maximum logical page length.



[3] Portrait and landscape page boundaries: printable area

Note: *Using the Left Registration command, clipping can occur at the right side of the logical page.*

The parameters associated with each PCL command can be given in different units of measurement as described with the command which is used. These units are mentioned in the table below.

Unit	*Description*
Rows	The height of a line at the current set line spacing
Column	The width of a space character in the current set font
Point	Basic printing industry unit 1/72 inch
Decipoint	Tenths of a point 1/720 inch
Dot	Basic resolution of the printer 1/300 inch

[4] PCL units of measurement

Default PCL settings

The following tables list the PCL5 default settings for the Océ Power Print Controller:

Job control	Number of copies	1
	Duplex	Off
	Staple	None
	Jog	Off
	Binding	Long edge
	Units of measurement	600 dpi
Page control	Orientation	Portrait
	Default bin	Bin 1
	Default tray	Tray 4 (Océ 8400) Tray 1 (Océ 9200)
	Page size	Paper size in default tray
	Vertical motion index	6 lines per inch
	Horizontal motion index	10 characters per inch
	Top margin	1/2”
	Text length	60 for Letter, 66 for A4
	Perforation skip	On
	Left and right margin	1/4” for Letter, 6 mm for A4
	Line termination	CR→CR; LF→LF; FF→FF
	End of line wrap	Off
Fonts	Symbol set	PC-8 (341)
	Spacing	Fixed
	Pitch	10 cpi
	Height	12 point
	Style	Upright
	Stroke weight	Medium
	Typeface	Courier

[5] Default settings for the Océ Power Print Controller with compatibility reference HP 5Si.

PCL fonts

PCL fonts come in two formats: bitmap and scalable (Speedo and TrueType). A font is defined by its typeface, symbol set, spacing, point size, stroke weight and orientation.

Scalable fonts

The table below lists the standard scalable PCL fonts supported by the Océ Power Print Controller. Any text in brackets indicates an alternative naming of the font weight or style.

Typeface	*Regular/Roman*	*Bold*	*Oblique Italic*	*Bold + Oblique/Italic*
Courier	●	●	●	●
CG Times	●	●	●	●
CG Omega	●	●	●	●
Coronet	●			
Clarendon Condensed	●			
Univers	● (Medium)	●	● (Medium)	●
Univers Condensed	● (Medium)	●	● (Medium)	●
Antique Olive	●	●	●	
Garamond	● (Antiqua)	● (Medium)	● (italic)	● (Italic Medium)
Marigold	●			

[6] Scalable PCL fonts supported by the Océ Power Print Controller

Typeface	*Regular/Roman*	*Bold*	*Oblique Italic*	*Bold + Oblique/Italic*
Albertus	● (Medium)	● (Extra Bold)		
Arial	●	●	●	●
Times New	●	●	●	●
Symbol	●			
WingDings	●			
Letter Gothic	●	●	●	

[6] Scalable PCL fonts supported by the Océ Power Print Controller (continued)

Bitmap fonts

In addition to the 45 scalable PCL fonts, the Océ Power Print Controller supports the bitmap fonts ‘Line Printer’ typeface 16.67 and 8.5 Pixels.

Download fonts

Download fonts can be software downloaded from applications. These download fonts can be temporary or permanently downloaded.

Temporary storage means that the fonts will be stored in local memory of the PDL environment and will be removed after the job has been completely processed. When fonts are downloaded permanently they will also be stored in local memory of the PDL environment, but they will be available until the printer is turned off.

Download fonts will always be local to the PDL in which they are downloaded. Other PDLs (i.e. Form PDL and/or Flagsheet PDL) do not have any knowledge of the downloaded fonts in a print context.

If download fonts are used in forms, the fonts have to be included in the form description.

Usage of download fonts in flagsheets holds that the download fonts have to be part of the flagsheet definition.

Note: *For more detailed information, refer to the Océ Power Print Controller Technical Reference Manual.*

Installed download fonts

Installed download fonts are download fonts that were downloaded as permanent fonts, while the 'INSTALLED' / 'PERMANENT' flag for the PDL in C-KOS was set to 'INSTALLED'.

During start-up these fonts will be scanned in by the PDL and can be used with the same specifications as if they were downloaded and made permanent.

This feature can be used to circumvent the cumbersome downloading of fonts, each time the printer is turned on.

Installed download fonts with a font ID equal to a permanent font with the same font ID, have a higher priority during selection.

The PCL5e PDL also supports this feature for downloaded symbol sets and macro's.

Note: *For more detailed information refer to the System Administration Manual.*

Symbol sets

A symbol set is a specified ordering of characters within a font. The International Standards Organisation (ISO) has defined a certain number of symbol sets, many containing the special characters to be found in specific European languages.

Example The cedilla (e.g. **ç**) for French and Portuguese symbol sets. The tilde character (ñ) for Spanish symbol sets.

Hewlett-Packard has also defined several of its own symbol sets.

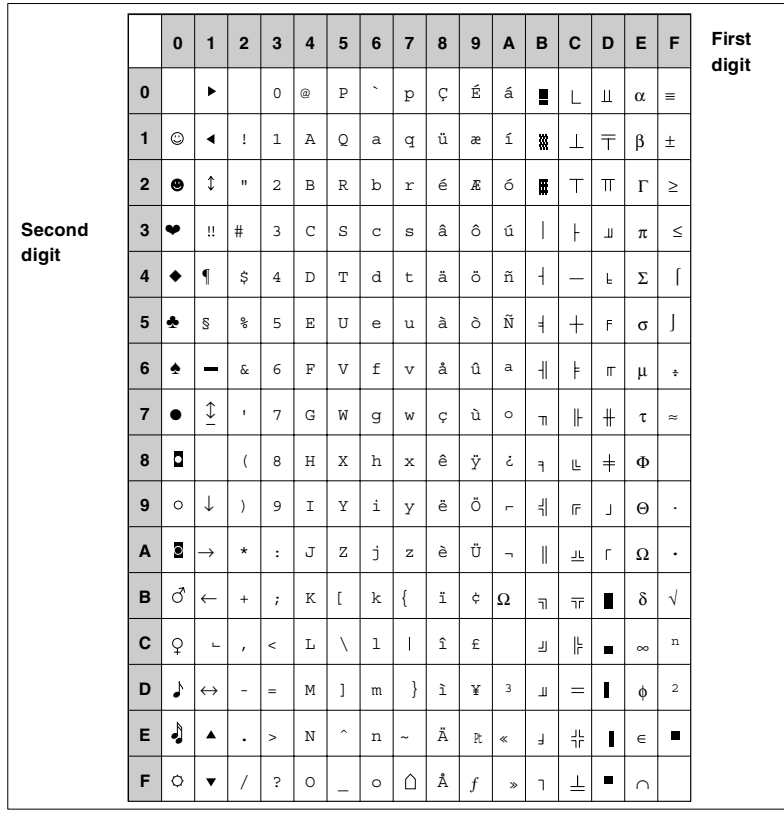
Example HP Roman-8, HP Legal, HP Math-8, PC-8

The symbol set assigns an ASCII value to a defined character.

Euro-symbol support In symbol set Win_3.1_L1 the Euro-symbol is supported.

Example

The hexadecimal value **9c** is defined by HP_PC-8 to represent the U.K. Pound sign (**£**).



Second digit	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		▶		0	@	P	`	p	Ç	É	á	▓	└	╨	α	≡
1	☺	◀	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	β	±
2	☻	↕	"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	❤	‼	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	◆	¶	$	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	♠	▬	&	6	F	V	f	v	å	û	ª	╢	╞	╓	µ	÷
7	●	↨	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	◘		(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	
9	○	↓	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	·
A	◙	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
B	♂	←	+	;	K	[	k	{	ï	¢	Ω	╗	╦	█	δ	√
C	♀	∟	,	<	L	\	l	|	î	£		╝	╠	▄	∞	n
D	♪	↔	-	=	M	]	m	}	ì	¥	³	╜	═	▌	φ	2
E	♫	▲	.	>	N	^	n	~	Ä	₧	«	╛	╬	▐	∈	■
F	☼	▼	/	?	O	_	o	⌂	Å	ƒ	»	┐	╧	▀	∩	

First digit

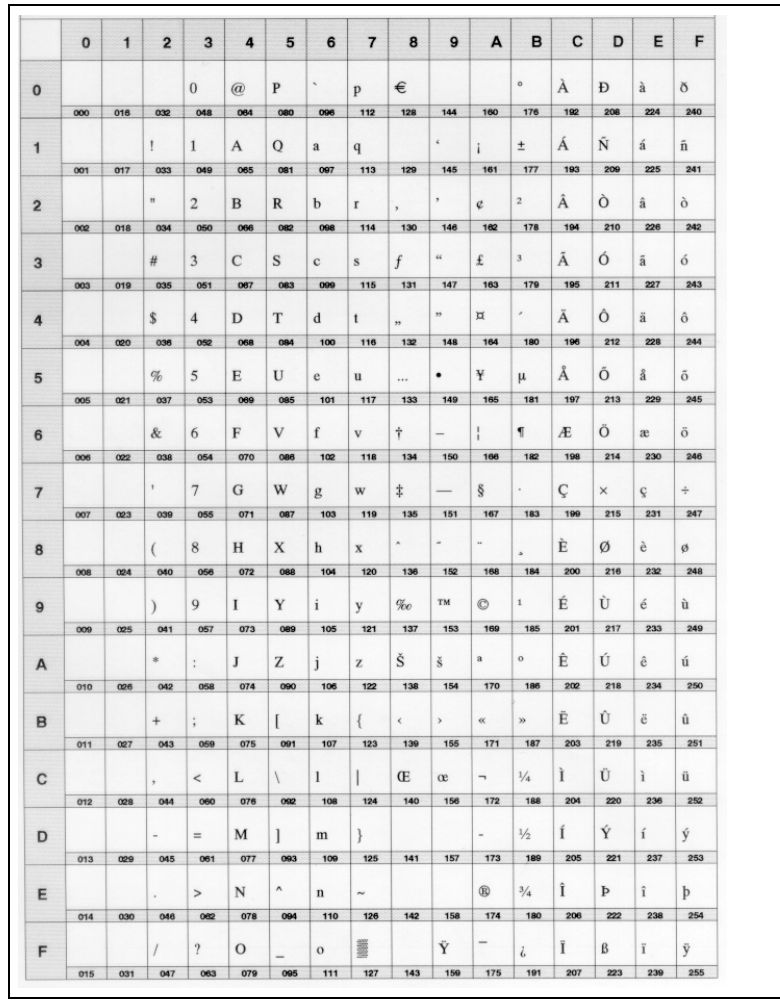
[7] PC-8 Character set: the default symbol set for the HP 5Si compatibility reference

The Océ Power Print Controller supports the following symbol sets:

- Roman-8
- RomanExt
- ECMA-94 Latin 1
- Latin 2
- Latin 5
- PC-8
- PC-8 D/N
- IBM 850
- PC 852
- PC-8 Turkish
- Win_3.0_L1, Win_3.1_L1, Win_3.1_L2, Win_3.1_L5
- DeskTop
- MC Text
- PS Math and PS Text
- Ventura Math, Ventura International and Ventura US
- Legal
- Math-8
- Pi Font
- Microsoft Publishing and Windows
- ISO-4 U.K.
- ASCII
- ISO-11 Swed
- ISO-15 Ital
- ISO-17 Span
- ISO-21 Ger
- ISO-60 Norw
- ISO-69 Fr
- Symbol
- Wingdings.

See the *PCL5 Printer Language Technical Reference Manual* available from Hewlett-Packard for an overview of all available symbol sets.

The Win_3.1_L1 symbol set has been extended with the Euro-symbol, see the following table:



	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	€			°	À	Ð	à	ð
	000	016	032	048	064	080	096	112	128	144	160	176	192	208	224	240
1			!	1	A	Q	a	q		‘	¡	±	Á	Ñ	á	ñ
	001	017	033	049	065	081	097	113	129	145	161	177	193	209	225	241
2			"	2	B	R	b	r	,	’	¢	²	Â	Ò	â	ò
	002	018	034	050	066	082	098	114	130	146	162	178	194	210	226	242
3			#	3	C	S	c	s	*f*	“	£	³	Ã	Ó	ã	ó
	003	019	035	051	067	083	099	115	131	147	163	179	195	211	227	243
4			$	4	D	T	d	t	„	”	¤	´	Ä	Ô	ä	ô
	004	020	036	052	068	084	100	116	132	148	164	180	196	212	228	244
5			%	5	E	U	e	u	…	•	¥	µ	Å	Õ	å	õ
	005	021	037	053	069	085	101	117	133	149	165	181	197	213	229	245
6			&	6	F	V	f	v	†	–	¦	¶	Æ	Ö	æ	ö
	006	022	038	054	070	086	102	118	134	150	166	182	198	214	230	246
7			'	7	G	W	g	w	‡	—	§	·	Ç	×	ç	÷
	007	023	039	055	071	087	103	119	135	151	167	183	199	215	231	247
8			(	8	H	X	h	x	ˆ	˜	¨	¸	È	Ø	è	ø
	008	024	040	056	072	088	104	120	136	152	168	184	200	216	232	248
9			)	9	I	Y	i	y	‰	™	©	¹	É	Ù	é	ù
	009	025	041	057	073	089	105	121	137	153	169	185	201	217	233	249
A			*	:	J	Z	j	z	Š	š	ª	º	Ê	Ú	ê	ú
	010	026	042	058	074	090	106	122	138	154	170	186	202	218	234	250
B			+	;	K	[	k	{	‹	›	«	»	Ë	Û	ë	û
	011	027	043	059	075	091	107	123	139	155	171	187	203	219	235	251
C			,	<	L	\	l	|	Œ	œ	¬	¼	Ì	Ü	ì	ü
	012	028	044	060	076	092	108	124	140	156	172	188	204	220	236	252
D			-	=	M	]	m	}			-	½	Í	Ý	í	ý
	013	029	045	061	077	093	109	125	141	157	173	189	205	221	237	253
E			.	>	N	^	n	~			®	¾	Î	Þ	î	þ
	014	030	046	062	078	094	110	126	142	158	174	190	206	222	238	254
F			/	?	O	_	o	▒		Ÿ	¯	¿	Ï	ß	ï	ÿ
	015	031	047	063	079	095	111	127	143	159	175	191	207	223	239	255

[8] Win_3.1_L1 symbol table

Overview of supported symbol sets and typefaces

The following table gives an overview of the available symbol sets and typeface combinations.

Symbol set / *Typeface*	Albertus	Antique Olive	Arial	CG Omega	CG Times	Clarendon cond	Coronet	Courier	Garamond	Letter Gothic	Line Printer 16_67/8_5 Med	Marigold	Symbol	Times New Roman	Univers	Univers condensed	Wingdings
DeskTop	x	x	x	x	x	x	x	x	x	x		x		x	x	x	
ISO 11 Swedish: names	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	
ISO 15 Italian	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	
ISO 17 Spanish	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	
ISO 21 German	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	
ISO 4 United Kingdom	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	
ISO 6 ASCII	x	x	x	x		x	x	x	x	x	x	x		x		x	
ISO 60 Norwegian v1	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	
ISO 69 French	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	
ISO 8859/ Latin 1											x						
ISO 8859/1	x	x	x	x	x	x	x	x	x	x		x		x	x	x	
ISO 8859/10 Latin 6											x						
ISO 8859/2 Latin 2	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	
ISO 8859/9 Latin 5	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	
Legal	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	
Math 8			x		x			x		x				x	x		
MC Text	x	x	x	x	x	x	x	x	x	x		x		x	x	x	
Microsoft Publishing	x	x	x	x	x	x	x	x	x	x		x		x	x	x	
PC 852	x	x	x	x	x	x	x	x	x	x		x		x	x	x	
PC-8	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	
PC-8 Danish Norwegian	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	
PC-8 Turkish	x	x	x	x	x	x	x	x	x	x		x		x	x	x	
PC-850	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	
Pi Font			x		x			x		x				x	x		

[9] Symbol set and typeface combinations

Symbol set \ *Typeface*	Albertus	Antique Olive	Arial	CG Omega	CG Times	Clarendon cond	Coronet	Courier	Garamond	Letter Gothic	Line Printer 16_67/8_5 Med	Marigold	Symbol	Times New Roman	Univers	Univers condensed	Wingdings
PS Math			x		x			x		x				x	x		
PS Text	x	x	x	x	x	x	x	x	x	x		x		x	x	x	
Roman-8	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	
Symbol													x				
Ventura Math					x			x		x					x		
Ventura US	x	x	x	x	x	x	x	x	x	x		x		x	x	x	
Ventura International	x	x	x	x	x	x	x	x	x	x		x		x	x	x	
Windows 3.0 Latin 1	x	x	x	x	x	x	x	x	x	x		x		x	x	x	
Windows 3.1 Latin 1	x	x	x	x	x	x	x	x	x	x		x		x	x	x	
Windows 3.1 Latin 2	x	x	x	x	x	x	x	x	x	x		x		x	x	x	
Windows 3.1 Latin 5	x	x	x	x	x	x	x	x	x	x		x		x	x	x	
Wingdings																	x

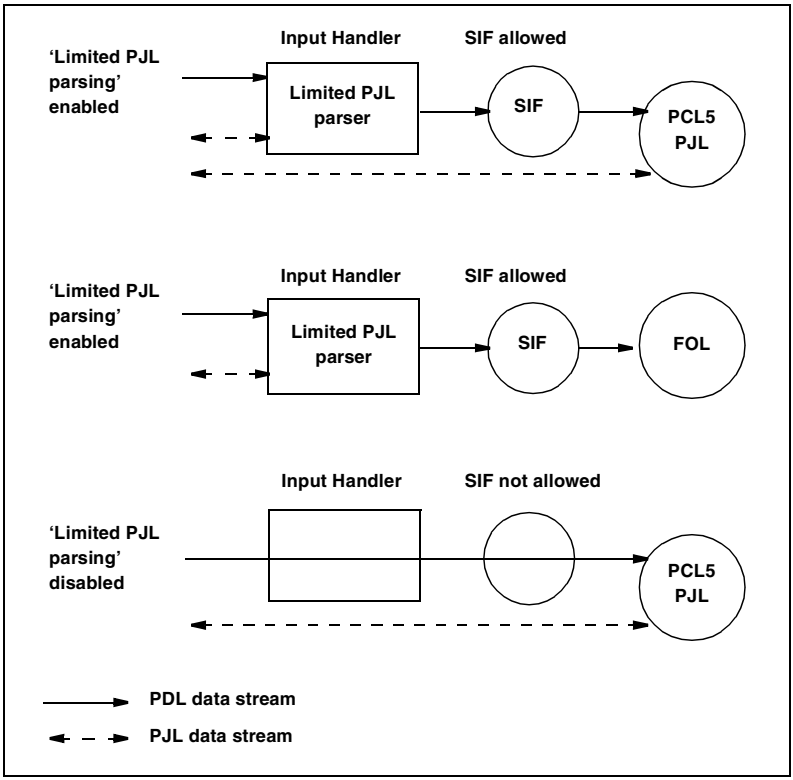
[9] Symbol set and typeface combinations

PJL support

The HP Printer Job Language (PJL) offers you more control over your print jobs and provides for status feedback information.

PJL in the Océ Power Print Controller is supported in two places:
- in the PCL PDL
- in the Input Handler.

Figure 10 shows this implementation.



[10] PJL support

For more information on 'Limited PJL parsing', refer to 'Limited PJL parsing' on page 38.

For more information on the parse option, refer to the Océ Power Print Controller Technical Reference Manual.

For more information configuring the parse option, refer to the System Administration Manual.

Using PJL

Full PJL support is only available for a PCL Print Context connected to a raw socket interface in bi-directional mode.

It is, however, possible to use PJL on a uni-directional raw socket interface. In this mode no response messages can be send back to the host. The solicited commands may not be used in this mode.

When ‘Limited PJL parsing’ is disabled, the PCL PDL will provide the unsolicited responses, and support for the remaining PJL functionality.

Command overview

PJL commands can be divided into 6 groups. The commands for each group are:

- Kernel commands
  UEL, COMMENT, ENTER
- Job Separation commands
  JOB, EOJ
- Environments commands
  DEFAULT, INITIALIZE, SET, RESET
- Status Readback commands
  INQUIRE, DINQUIRE, ECHO, INFO, USTATUS, USTATUSOFF
- Device Attendance commands
  RDYMSG, OPMSG, STMSG
- PJL File System commands
  FSDELETE, FSDOWNLOAD, FSINIT, FSMKDIR.

For more information on the syntax and support of these commands, refer to table 27 on page 70, and the related HP documentation.

General PJL parse requirements

PJL parsing is started when the following ‘string’ is encountered in the data-stream: ‘<ESC>%-12345X@PJL’ followed by a ‘<LF>’, or a PJL command followed by a ‘<LF>’. Each line following this line, and starting with ‘@PJL’ is interpreted as a PJL command. Anything else causes PJL interpretation to finish.

The escape sequence ‘<ESC>%-12345X’ is called the Universal Exit Language (UEL) command. It should cause the PCL5 PDL to stop reading and parsing the data-stream, and switch back to the caller (for example, the emulation chooser).

In order to efficiently parse PJL it is sufficient to start each line with a ‘@PJL’ string and end each line with a ‘<LF>’.

According to the specifications a PCL5 job is to be enclosed within UEL escape sequences, so they can be used as markers to identify job boundaries. See the following example:

```
<ESC>%-12345X@PJL<LF>
@PJL JOB NAME = "job1"<LF>
this is a page of job 1<LF><FF>
<ESC>%-12345X@PJL<LF>
@PJL EOJ<LF>
@PJL JOB NAME = "job2"<LF>
this is a page of job2<LF><FF>
<ESC>%-12345X@PJL<LF>
@PJL EOJ
```

In this example it is not allowed to split the job between the ‘EOJ’ and ‘JOB’ lines, because the ‘@PJL JOB NAME = "job2"’ will be interpreted not as PJL but as plain text.

A valid sequence would be:

```
<ESC>%-12345X@PJL<LF>
@PJL JOB NAME = "job1"<LF>
this is a page of job 1<LF><FF>
<ESC>%-12345X@PJL<LF>
@PJL EOJ<LF>
<ESC>%-12345X@PJL JOB NAME = "job2"<LF>
this is a page of job2<LF><FF>
<ESC>%-12345X@PJL<LF>
@PJL EOJ
```

Limited PJL parsing

With ‘parse support’ set to ‘pjl’ or ‘pjl+eoj’ in C-KOS, a limited set of PJL commands will be processed in the Input Handler (see figure 10 on page 34). This limited PJL support is refer to as ‘Limited PJL parsing’ in this manual. ‘Limited PJL parsing’ offers you more control over your print jobs and provides for status feedback information.

Using ‘Limited PJL parsing’

‘Limited PJL parsing’ can both be used on a uni-directional or bi-directional socket interface.

‘Limited PJL parsing’ on a uni-directional socket interface When the socket interface is in uni-directional mode, then ‘Limited PJL parsing’ can still be enabled. Only job separation (JOB and EOJ command) is supported in this mode. PJL commands that require a solicited response will be filtered.

‘Limited PJL parsing’ on a bi-directional socket interface When the socket is in bi-directional mode and ‘Limited PJL parsing’ is enabled, then solicited messages are handled correctly in the Input Handler. Use this mode to synchronize the host with the printer and to separate the datastream into jobs. This mode works in combination with both a FOL print context and a PCL print context.

‘Limited PJL parsing’ commands

The following PJL commands are supported for ‘Limited PJL parsing’:

- ECHO
- INFO
- USTATUS
- USTATUSOFF
- JOB, used for job separation
- EOJ, used for job separation.

In the next sections, a detailed description of the supported commands is given.

ECHO

The ‘ECHO’ command prompts the printer to return a specified message to the host.

In a multi-user environment, the printer may respond to many different status requests. Since the status messages are buffered in the printer until they are received, the current application may receive status messages that were requested by a previous application. This happens in situations where the application requests information, or unsolicited status is enabled, and the application closes before receiving the status messages.

Use the ECHO command to synchronize status so that you know the status you are receiving is the requested status. To do this, send an ECHO command to the printer, and then discard the incoming status messages until your message is echoed back. Eliminate all data received from the printer up to the echoed response string. For the remainder of your print job, you can be sure that all status messages you receive after you echoed message were requested by your application. If you turned on USTATUS, you may receive unsolicited status information at any time.

Syntax	@PJL ECHO [<words>] [<CR>]<LF>	
Response syntax	@PJL ECHO [<words>]<CR><LF> <FF>	
Parameters	*Functional range*	*Default*
<words>	ASCII 33 - 255,<SP>,<HT>	Not applicable.

The <words> parameter must begin with a printable character, and can contain any character form ASCII value 33 up to 255 inclusive, in addition to space characters and horizontal tabs. The <words> parameter is not a string variable, and needs therefore not to be enclosed in quotation marks. The maximum length for <words> is 80 bytes.

The ‘ECHO’ command below immediately echoes back the provided message (including the “ characters, they are part of the message) to the host.

```
ESC>%-12345X@PJL ECHO "some text"<LF>
```

will result in the following response:

```
PJL ECHO "some text"<CR><LF>
<FF>
```

INFO

The ‘INFO’ command is used to request a specified category of information.
The ‘INFO’ command is supported for the following categories only:
- STATUS
- USTATUS

Syntax	@PJL INFO category [<CR>]<LF>
Response syntax	@PJL INFO category<CR><LF> [1 or more lines of printable characters or <WS> followed by <CR><LF>] <FF>
Category	*Description*
STATUS	Provides the current printer status
USTATUS	Lists the unsolicited status variables provided by the printer, the possible variable values, and the current variable settings.

The ‘INFO STATUS’ command:

```
<ESC>%-12345X@PJL INFO STATUS<CR><LF>
```

immediately returns the printer status.

The returned message (example) has the following format:

	ONLINE	*OFFLINE*
IDLE	@PJL STATUS<CR><LF> CODE=10001<CR><LF> DISPLAY="Idle"<CR><LF> ONLINE=TRUE<CR><LF> <FF>	@PJL INFO STATUS<CR><LF> CODE=10002<CR><LF> DISPLAY="Idle"<CR><LF> ONLINE=FALSE<CR><LF> <FF>
PROCESS-ING	@PJL INFO STATUS<CR><LF> CODE=10023<CR><LF> DISPLAY="Processing"<CR><LF> ONLINE=TRUE<CR><LF> <FF>	PJL INFO STATUS<CR><LF> CODE=40079<CR><LF> DISPLAY="Processing"<CR><LF> ONLINE=FALSE<CR><LF> <FF>

The ‘INFO USTATUS’ command:

```
<ESC>%-12345X@PJL INFO USTATUS<CR><LF>
```

sends back which ‘USTATUS’ commands are supported and will result in the following response:

```
@PJL INFO USTATUS<CR><LF>
DEVICE=OFF [2 ENUMERATED]<CR><LF>
OFF<CR><LF>
ON<CR><LF>
JOB=OFF [2 ENUMERATED]<CR><LF>
OFF<CR><LF>
ON<CR><LF>
PAGE=OFF [2 ENUMERATED]<CR><LF>
OFF<CR><LF>
ON<CR><LF>
<FF>
```

The response in the above example means that the ‘USTATUS DEVICE’, ‘USTATUS JOB’ and ‘USTATUS PAGE’ commands are supported but currently turned off.

When the response is generated by the PCL5 PDL (‘Limited PJL parsing’ disabled) then also ‘VERBOSE’ is available for ‘USTATUS DEVICE’.

The ‘TIMED’ category is not supported.

USTATUS

The USTATUS command is used to enable or disable unsolicited printer status. Unlike the status information, which is solicited by sending the ‘INFO’ command, unsolicited status is sent automatically when the status changes. The ‘USTATUS’ command is used when you want to know:

- Device status changes. For example, printer on-line/off-line.
- Job status changes. For example, when a JOB command is encountered, the job is completely printed, or the job is cancelled.
- Page status changes when each interpreted page is rendered and ready to be printed.

Syntax	@PJL USTATUS variable = value [<CR>]<LF>
Status message syntax	@PJL USTATUS variable <CR><LF> [1 or more lines of printable characters or <WS> followed by <CR><LF>] <FF
Variable	*Value*
DEVICE	[ON|OFF]
JOB	[ON|OFF]
PAGE	[ON|OFF]

This command can be used with the supported categories ‘DEVICE’, ‘JOB’ and ‘PAGE’, returned by the ‘INFO USTATUS’ command. It is used to enable or disable unsolicited status messages for the specified category.

The ‘USTATUS DEVICE’ command:

```
<ESC>%-12345X@PJL USTATUS DEVICE=ON<CR><LF>
```

will result in messages to the host when the printer status changes from on-line to off-line and vice-versa. Only the changes will be reported.

The ‘USTATUS JOB’ and ‘USTATUS PAGE’ are to be handled by the PCL5 PDL.

When no ‘Limited PJL parsing’ is configured then the ‘VERBOSE’ option can also be given. In this case the PJL interpreter in the PCL5 PDL will also return error messages while parsing the PJL commands.

The ‘USTATUS JOB’ command:

```
<ESC>%-12345X@PJL USTATUS JOB=ON<CR><LF>
```

will result in response messages when a job is started and finished, for example, when a ‘@PJL JOB’ command is encountered. So the following command:

```
@PJL JOB NAME="job"<CR><LF>
```

will result in the following message:

```
@PJL USTATUS JOB<CR><LF>
START<CR><LF>
```

```
NAME="job"<CR><LF>
<FF>
```

and when the page before the ‘EOJ’ command in the data stream has been scheduled the command:

```
@PJL EOJ NAME="eoj"<CR><LF>
```

will result in the following message:

```
@PJL USTATUS EOJ<CR><LF>
END
NAME="eoj"<CR><LF>
PAGES=3<CR><LF>          <== number of interpreted pages
<FF>
```

USTATUSOFF

The ‘USTATUSOFF’ command turns off all unsolicited status for ‘JOB’, ‘PAGE’ and ‘DEVICE’. This command eliminates the need to send several ‘USTATUS’ with option ‘OFF’ for the supported categories.

Syntax	@PJL USTATUSOFF [<CR>]<LF>	
Response syntax	None	
Parameters		
None		

JOB

The ‘JOB’ command informs the printer of the start of a PJL job and synchronizes the job and page status information.

Further, the ‘JOB’ command is used to specify which pages of a job are to be printed. The ‘JOB’ and ‘EOJ’ commands are used for spooling and related applications to monitor printing status, job name, print portions of a job, or to

mark job boundaries to keep the printer from treating a single print job as multiple jobs (for example, when printing a job with a banner page).

Syntax	@PJL JOB [NAME="job name"] [START=firstpage] [END=lastpage][<CR>]<LF>	
Response syntax	None	
Parameters	*Functional range*	*Default*
NAME="job name"	ASCII 33 - 255,<SP>,<HT>	Not applicable.
START=first-page	1-0x7fffffff	1
END=lastpage	1-0x7fffffff	entire job

■ NAME="job name"
The command option ‘NAME’ tags the print job with a job name. The variable "job name" can be any combination of printable characters and spaces or horizontal tab characters, with a maximum of 80 significant characters. The "job name" variable is a string and must be enclosed in double quotes.

■ START=firstpage
The command option ‘START’ is used to provide a non-printing mode for skipping to a selected portion of the job. It indicates the first page to be printed. If the ‘START’ option is omitted, the printer starts printing at the beginning of the job. If the end of the job comes before the ‘START’ page, no pages are printed.

■ END=lastpage
The command option ‘END’ indicates the page number of the last page to be printed. The ‘lastpage’ variable is relative to page 1 of the print job. If the ‘END’ variable is omitted, the printer prints to the end of the job. If the end of job is encountered before the ‘END’ page, printing will be terminated. Additionally, if the ‘START’ page is greater than the ‘END’ page, no pages are printed.

Note: *Page range printing (‘START’ and ‘END’ options) is only supported by the PCL5 PDL.*

EOJ

The ‘EOJ’ command informs the printer of the end of a PJL job and synchronizes the job status information.

Syntax	@PJL EOJ [NAME="job name"][<CR>]<LF>	
Response syntax	None	
Parameters	*Functional range*	*Default*
NAME="job name"	ASCII 33 thru 255,<SP>,<HT>	Not applicable.

■ NAME="job name"
Using the ‘EOJ’ command, you can name your print job. The ‘job name’ variable is a string and must be enclosed in double quotes.The ‘job name’ string needs not to be the same name used in the ‘JOB’ command. If the ‘NAME’ option is included, the unsolicited end-of-job status includes the job name (if unsolicited job status is enabled).

The Input Handler can use the ‘EOJ’ command as a job separator. (Configurable by your System Consultant). This command only separates jobs if the option ‘pjl+eoj’ is selected in C-KOS.

Note: *The ‘JOB’ and ‘EOJ’ commands should always be used in pairs. Do not use one without the other. If you use un-paired ‘JOB’ and ‘EOJ’ commands, unexpected results may occur.*

When a ‘JOB’ command is received, the PCL5 PDL does not recognize the ‘UEL’ command as a PJL job boundary until an ‘EOJ’ command is received. ‘UEL’ commands within a PJL ‘JOB’ and ‘EOJ’ command pair are treated as printer language resets. They default the print environment to the PJL Current Environment settings, instead of the User Default Environment.

HP-GL/2 commands

The HP-GL/2 language prints vector graphics. The PCL language in the PCL5 emulation defines the area on the page where the HP-GL/2 graphics print and it provides the means to enter the HP-GL/2 mode. To print with HP-GL/2, you have to exit from the PCL mode and enter in HP-GL/2 mode.

HP-GL/2 command syntax

Syntax: XX ##,##;

- *XX* is a two-letter mnemonic that represents the function.
- *##* is the parameter.

Note: *if a required parameter is missing, 0 is assumed.*

- *,* is a required separator, i.e. one or more commas and/or spaces.
- *;* can be used as terminator. The EOF (decimal 255), ETX (decimal 003) and the first letter of the next mnemonic are also recognised as a terminator.

Entering the HP-GL/2 mode

When the printer receives one of the following escape sequences, it switches to HP-GL/2 mode:

- <ESC>%0B (sets the pen position at the previous HP-GL/2 pen position)
- <ESC>%1B (sets the pen position at the previous PCL pen position).

The printer remains in the HP-GL/2 mode until it receives an Enter PCL mode command (<ESC>%#A) or a printer reset (<ESC>E) command. The HP-GL/2 mode will also be exited when a print job is prematurely ended.

Returning to the PCL mode

When you are in the HP-GL/2 mode and you want the printer to interpret PCL commands, you must use one of the following escape sequences to return to the PCL mode:

- <ESC>%0A (sets the pen position at the previous PCL pen position)
- <ESC>%1A (sets the pen position at the current HP-GL/2 pen position).

Describing the page in HP-GL/2

Plotter units and user units

You can express coordinates along the X and Y axes using two types of units: plotter units and user units.

Plotter units The plotting area is divided into plotter units with 1016 plotter units per inch, 40 plotter units per millimetre. The printer converts the number of plotter units to equivalent dot coordinates. Since the printer prints in dots per inch, a scale factor is used. This yields a plotted image that is as close as possible to the image that would be achieved on the plotter.

User units User units allow you to use the Scale command to redefine the size of units along the x and y axes and to customise the coordinate system to suit your needs.

Plotting grid

The plotting grid is a two-dimensional Cartesian coordinate system. In normal orientation, the origin point (0,0) is at the lower-left corner of the imageable area of the page. The left edge of the imageable area is the y axis and the bottom edge is the x axis. When rotation is enabled (RO command), the origin point rotates to the upper-left corner of the imageable area.

Image area and scaling factors

Picture presentation directives are a group of commands which are used to define a bounding rectangle to contain the HP-GL/2 image and to determine a scaling factor for enlarging or reducing it. The position of the upper-left corner of the bounding rectangle is determined by the anchor point.

Vector graphics limits

The area on the page where a vector graphics image can be printed, is determined by the effective window, which is the intersection of the following four boundaries:

- Hard-clip limit
  The hard-clip limit refers to the boundaries resulting from the physical limits of the printer (identical to the printable area in PCL mode).
- Soft-clip limit
  This refers to the area defined with the IW command.
- Logical page
  The logical page defines the area where the cursor can be positioned. The cursor refers to the location on the page where the next character will be positioned, using the commands from the Vector group.
- PCL picture frame
  The default initial scaling points and input window.

Chapter 3
PCL5e commands overview

This chapter provides an overview of all PCL commands supported by the Océ Power Print Controller.

Control codes

A control code is a PCL language command that initiates a printer function. The Océ Power Print Controller supports the following control codes:

Control Code	*Value*	*Description*
BS	Decimal 8 Hexadecimal 08	Backspace Moves one column to the left, unless already at the left margin, then no action is taken.
CR	Decimal 13 Hexadecimal 0D	Carriage Return Moves to the left margin on the current line.
ESC	Decimal 27 Hexadecimal 1B	Escape Indicates the beginning of an escape sequence; it identifies the string of characters in an escape sequence as a printer command.
FF	Decimal 12 Hexadecimal 0C	Form Feed Moves to the first line of the next page while maintaining the current column position.
HT	Decimal 9 Hexadecimal 09	Horizontal Tab Moves to the next horizontal tab stop. Tab stops are positioned at every eight columns to the right of the left margin.
LF	Decimal 10 Hexadecimal 0A	Line Feed Moves to the next line while maintaining the current column position.
SI	Decimal 15 Hexadecimal 0F	Shift In Selects characters form the primary font until reception of a Shift Out
SO	Decimal 14 Hexadecimal 0E	Shift Out Selects characters form the secondary font until reception of a Shift In

[11] Control codes supported by the Océ Power Print Controller

PCL command overview

The following tables list the generic PCL5e commands supported by the Océ Power Print Controller.

Job control commands

Function	*Parameter*	*PCL command*
Universal exit/start of PJL	None	Esc.%-12345X
Reset	None	<Esc>E
Number of copies	1-32767	<Esc>&*l*#X
Simplex/Duplex	Simplex	<Esc>&*l*0S
	Duplex Long Edge	<Esc>&*l*1S
	Duplex Short Edge	<Esc>&*l*2S
Left Offset Registration	# of Decipoints	<Esc>&*l*#U
Top Offset Registration	# of Decipoints	<Esc>&*l*#Z
Units of Measure	Dots/inch	<Esc>&u#D

[12] Job control commands for PCL5e general

Function Océ 9200 Series	*Parameter*	*PCL command*
Output Bin (Stacker/Stapler)	1	<Esc>&*l*1G
	2	<Esc>&*l*2G
Output Bin (Sorter)	1-40: sorter bins	<Esc>&*l*#G
Error output bin Manual feed output bin	0	<Esc>&*l*0G

[13] Page control commands for PCL5e Océ 9200 Series

Function Océ 8400 Series	*Parameter*	*PCL command*
Finisher	61	<Esc>&*l*61G
Output tray	81	<Esc>&*l*81G
Output Bin (Sorter)	1-20: sorter bins	<Esc>&*l*#G
Error output tray	0	<Esc>&*l*0G

[14] Page control commands for PCL5e Océ 8400 Series

Page control commands

Function	*Parameter*	*PCL command*
Page Size See Note on page 56.	A5	<Esc>&*l*25A
	A4	<Esc>&*l*26A
	A3	<Esc>&*l*27A
	Letter	<Esc>&*l*2A
	Legal	<Esc>&*l*3A
	Folio	<Esc>&*l*501A
	Foolscap Folio	<Esc>&*l*504A
	Kwarto	<Esc>&*l*502A
	Commercial	<Esc>&*l*503A
	Ledger	<Esc>&*l*6A
	Legal Small	<Esc>&*l*601A
	US-standard	<Esc>&*l*602A
Orientation	Portrait	<Esc>&*l*0O
	Landscape	<Esc>&*l*1O
	Reverse Portrait	<Esc>&*l*2O
	Reverse Landscape	<Esc>&*l*3O
Page Side	Next Side	<Esc>&a0G
	Front Side	<Esc>&a1G
	Back Side	<Esc>&a2G
Job Separation	None	<Esc>&l1T
Paper Source Océ 9200 Series	See Table 16 on page 57	
Paper Source Océ 8400 Series	See Table 17 on page 58	

[15] Page control commands for PCL5e

Function	*Parameter*	*PCL command*
Print Direction	Degrees of Rotation: 0	<Esc>&a0P
	Degrees of Rotation: 90	<Esc>&a90P
	Degrees of Rotation: 180	<Esc>&a180P
	Degrees of Rotation: 270	<Esc>&a270P
Left Margin	# of Columns	<Esc>&a#L
Right Margin	# of Columns	<Esc>&a#M
Clear Horizontal Margins	None	<Esc>9
Top Margin	# of Lines	<Esc>&*l*#E
Text Length	# of Lines	<Esc>&*l*#F
Perforation Skip	Disable	<Esc>&*l*0L
	Enable	<Esc>&*l*1L
Horizontal Motion Index	# of 1/120” Increments	<Esc>&k#H
Vertical Motion Index	# of 1/48” Increments	<Esc>&*l*#C
Line Spacing	Lines/Inch	<Esc>&*l*#D

[15] Page control commands for PCL5e (continued)

Océ 9200 Series When you indicate a tray as paper source, you refer to a logical tray. On your printer, physical trays are grouped into logical trays by use of the ‘TRAYMODE’ function in KOS. When you refer to logical trays, you need to know the current tray mapping. How to link paper input trays is described in the Océ 9200 Series System Operation Manual.

Océ 8400 Series In the Océ 8400 Series you always select the physical tray. If the bulk tray is linked to a cassette, the linked cassette still can be selected separately. How to link paper input trays is described in the Océ 8400 Series System Operation Manual.

Attention: *The PCL5 PDL supports Page Size selection, using the ‘<Esc>&l#A’ sequence. This implies the automatic selection of a tray which contains the requested page size, keeping in mind the following considerations:*

- If the requested page size is not present in any of the input trays, then the job is interpreted on the requested size, but printed on the page size that is in the current input tray. This means that the user is not asked to put the requested page size in one of the input trays.
- It is still possible to select explicitly a specific input tray, via the Paper Source function. This has no effect on the current page size.
- Explicit tray selection via the Paper Source function has priority over explicit Page Size selection, when both functions are used simultaneously.
- The Page Size commands listed in the table above are those that are supported by the PCL5 PDL. However, several of those paper formats are not supported by the engine. For example, the Océ 9200 Series does not support the paper formats A3 and A5.

Océ 9200 Series tray map The selection of the input trays is described in the following table:

PCL paper source:	*PCL escape sequence:*	*Océ 9200 Series tray:*
paper source	<Esc>&*l*0H	Eject Page
main paper source	<Esc>&*l*1H	upper tray
manual feed	<Esc>&*l*2H	manual feed
manual envelope feed	<Esc>&*l*3H	lower tray
alternate paper source	<Esc>&*l*4H	lower tray
optional large paper source	<Esc>&*l*5H	upper tray on Océ 9245 middle tray on Océ 9260
envelope feeder	<Esc>&*l*6H	current tray
auto tray selection	<Esc>&*l*7H	current tray
tray 1	<Esc>&*l*8H	current tray
HCI tray 20	<Esc>&*l*20H	manual feed
HCI tray 21	<Esc>&*l*21H	lower tray
HCI tray 22	<Esc>&*l*22H	upper tray on Océ 9245 middle tray on Océ 9260
HCI tray 23	<Esc>&*l*23H	upper tray
HCI tray 24	<Esc>&*l*24H	upper tray

[16] Selection of the input trays Océ 9200 Series

Note: *The tray map is configurable for PCL escape sequence '<Esc>&l1H' up to '<Esc>&l8H' inclusive, by your System Consultant.*

Océ 8400 Series tray map The selection of the input trays is described in the following table:

PCL paper source:	*PCL escape sequence:*	*Océ 8400 Series tray:*
paper source	<Esc>&*l*0H	Eject Page
main paper source	<Esc>&*l*1H	upper cassette
manual feed	<Esc>&*l*2H	upper cassette
manual envelope feed	<Esc>&*l*3H	lower cassette
alternate paper source	<Esc>&*l*4H	bulk tray
optional large paper source	<Esc>&*l*5H	middle cassette
envelope feeder	<Esc>&*l*6H	current tray
auto tray selection	<Esc>&*l*7H	current tray
tray 1	<Esc>&*l*8H	current tray
HCI tray 20	<Esc>&*l*20H	current tray
HCI tray 21	<Esc>&*l*21H	upper cassette
HCI tray 22	<Esc>&*l*22H	middle cassette
HCI tray 23	<Esc>&*l*23H	lower cassette
HCI tray 24	<Esc>&*l*24H	bulk tray

[17] Selection of the input trays Océ 8400 Series

Note: *The tray map is configurable for PCL escape sequence '<Esc>&l1H' up to '<Esc>&l8H' inclusive, by your System Consultant.*

Cursor positioning commands

Function	*Parameter*	*PCL command*
Horizontal Cursor Position	# of Columns	<Esc>&a#C
	# of Dots	<Esc>*p#X
	# of Decipoints	<Esc>&a#H
Vertical Cursor Position	# of Rows	<Esc>&a#R
	# of Dots	<Esc>*p#Y
	# of Decipoints	<Esc>&a#V
Half-Line Feed	None	<Esc>=
Line Termination	CR→CR; LF→LF; FF→FF	<Esc>&k0G
	CR→CR-LF; LF→LF; FF→FF	<Esc>&k1G
	CR→CR; LF→CR-LF; FF→CR-FF	<Esc>&k2G
	CR→CR-LF; LF→CR-LF; FF→CR-FF	<Esc>&k3G
Push/Pop Position	Push	<Esc>&f0S
	Pop	<Esc>&f1S

[18] Cursor positioning commands for PCL5e

Font selection commands

Function	*Parameter*	*PCL command*
Symbol Set	Primary Font	<Esc>(ID
	Secondary Font	<Esc>)ID
Select Default Font	Primary Font	<Esc>(3@
	Secondary Font	<Esc>)3@
Spacing	Fixed (Primary Font)	<Esc>(s0P
	Proportional (Primary Font)	<Esc>(s1P
	Fixed (Secondary Font)	<Esc>)s0P
	Proportional (Secondary Font)	<Esc>)s1P
Pitch	Characters/Inch (Primary Font)	<Esc>(s#H
	Characters/Inch (Secondary Font)	<Esc>)s#H
Set Pitch Mode	10.0	<Esc>&k0S
	16.5-16.7 (Comp)	<Esc>&k2S
	12.0 (Elite)	<Esc>&k4S
Height	# of Points (Primary Font)	<Esc>(s#V
	# of Points (Secondary Font)	<Esc>)s#V
Style	# for Style (Primary Font)	<Esc>(s#S
	# for Style (Secondary Font)	<Esc>)s#S
Stroke Weight	# for Weight (Primary Font)	<Esc>(s#B
	# for Weight (Secondary Font)	<Esc>)s#B

[19] Font selection commands for PCL5e

Typeface	Typeface Number (Primary Font)	<Esc>(s#T
	Typeface Number (Secondary Font)	<Esc>)s#T
Font Selection by ID	Font ID Number (Primary Font)	<Esc>(#X
	Font ID Number (Secondary Font)	<Esc>)#X
Underline	Enable Fixed	<Esc>&d0D
	Enable Floating	<Esc>&d3D
	Disable	<Esc>&d@
Transparent Print Data	# of Bytes	<Esc>&p#X

[19] Font selection commands for PCL5e

Font management commands

Function	*Parameter*	*PCL command*
Assign Font ID#	Font ID #	<Esc>*c#D
Font Control	Delete all Fonts	<Esc>*c0F
	Delete Temp Fonts	<Esc>*c1F
	Delete Last Font ID	<Esc>*c2F
	Delete Last Char.	<Esc>*c3F
	Make Font Temp.	<Esc>*c4F
	Make Font Perm.	<Esc>*c5F
	Copy/Assign Font	<Esc>*c6F

[20] Font management commands for PCL5e

Soft font creation commands

Function	*Parameter*	*PCL command*
Font Descriptor	# of Bytes	<Esc>)s#W
Character Code	ASCII Code #	<Esc>*c#E
Download	# of Bytes	<Esc>(s#W
Set SymbolSet ID#	Symbol Set ID (in PCL Id column on the Printer Status Report)	<Esc>*c#R
Define SymbolSet	# of Bytes(0-32767)	<Esc>(f#W

[21] Soft font creation commands for PCL5e

Function	*Parameter*	*PCL command*
SymbolSet Control	Delete all symbol sets	<Esc>*c0S
	Delete all temporary symbol sets	<Esc>*c1S
	Delete current soft symbol set	<Esc>*c2S
	Make current soft symbol set temporary	<Esc>*c4S
	Make current soft symbol set permanent	<Esc>*c5S

[21] Soft font creation commands for PCL5e (continued)

Graphics (vector graphics) commands

Function	*Parameter*	*PCL command*
Picture Frame Horizontal Size	# of Decipoints	<Esc>*c#X
Picture Frame Vertical Size	# of Decipoints	<Esc>*c#Y
Set Picture Frame Anchor Point	None	<Esc>*c0T
HPGL/2 Horizontal Plot Size	# of inches	<Esc>*c#K
HPGL/2 Vertical Plot Size	# of inches	<Esc>*c#L
Enter HPGL/2	Use previous HPGL/2 position	<Esc>%0B
	Use current PCL cursor position	<Esc>%1B
Enter PCL Mode	Use previous PCL cursor position	<Esc>%0A
	Use current HPGL/2 position	<Esc>%1A

[22] Graphics (vector graphics) commands for PCL5e

Graphics (raster graphics) commands

Function	*Parameter*	*PCL command*
Resolution	75 dots/inch	<Esc>*t75R
	100 dots/inch	<Esc>*t100R
	150 dots/inch	<Esc>*t150R
	200 dots/inch	<Esc>*t200R
	300 dots/inch	<Esc>*t300R
	600 dots/inch	<Esc>*t600R
Graphics Presentation	Rotate Image	<Esc>*r0F
	Landscape-compat.	<Esc>*r3F
Raster Height	# of Raster Rows	<Esc>*r#T
Raster Width	# of Pixels	<Esc>*r#S
Start Graphics	Left Margin	<Esc>*r0A
	Current Cursor	<Esc>*r1A
Raster Y Offset	# of Raster Lines	<Esc>*b#Y
Set Compression Mode	Unencoded	<Esc>*b0M
	Run-Length Encoded	<Esc>*b1M
	TIFF (Tagged Image File Format)	<Esc>*b2M
	Delta Row	<Esc>*b3M
	Adaptive Compression	<Esc>*b5M
Transfer Raster data	# of Bytes	<Esc>*b#W
End Graphics Version B	None	<Esc>*rB
End Graphics Version C	None	<Esc>*rC

[23] Graphics (raster graphics) commands for PCL5e

Graphics (print model imaging) commands

Function	*Parameter*	*PCL command*
Source Transparency Mode	Transparent	<Esc>*v0N
	Opaque	<Esc>*v1N
Pattern Transparency Mode	Transparent	<Esc>*v0X
	Opaque	<Esc>*v1X
Select Current Pattern	Solid Black (default)	<Esc>*v0T
	Solid White	<Esc>*v1T
	HP Shading Pattern	<Esc>*v2T
	HP X-Hatch Pattern	<Esc>*v3T
	User-defined Pattern	<Esc>*v4T

[24] Graphics (print model imaging) commands for PCL5e

Graphics (rectangular area fill) commands

Function	*Parameter*	*PCL command*
Horizontal Rectangle Size	# of Dots	<Esc>*c#A
	# of Decipoints	<Esc>*c#H
Vertical Rectangle Size	# of Dots	<Esc>*c#B
	# of Decipoints	<Esc>*c#V
Area Fill ID	2% Gray	<Esc>*c2G
	10% Gray	<Esc>*c10G
	15% Gray	<Esc>*c15G
	30% Gray	<Esc>*c30G
	45% Gray	<Esc>*c45G
	70% Gray	<Esc>*c70G
	90% Gray	<Esc>*c90G
	100% Gray	<Esc>*c100G
	Horizontal Lines	<Esc>*c1G
	Vertical Lines	<Esc>*c2G
	Diagonal Lines	<Esc>*c3G
	User-defined	<Esc>*c4G
	Square Grid	<Esc>*c5G
	Diagonal Grid	<Esc>*c6G
	User-defined Pattern	<Esc>*c#G

[25] Graphics (rectangular area fill) commands for PCL5e

Function	*Parameter*	*PCL command*
Fill Rectangle	Solid black (default)	<Esc>*c0P
	Solid white (erase)	<Esc>*c1P
	Shaded Fill	<Esc>*c2P
	XHatched Fill	<Esc>*c3P
	User-defined Pattern	<Esc>*c4P
	Current Pattern	<Esc>*c5P
Define Pattern	# of Bytes	<Esc>*c#W
User-defined Pattern Control	Delete all Patterns	<Esc>*p0Q
	Delete all temporary Patterns	<Esc>*p1Q
	Delete current pattern	<Esc>*p2Q
	Make pattern temporary	<Esc>*p4Q
	Make pattern permanent	<Esc>*p5Q
Set Pattern reference Point	Rotate w/ print direction	<Esc>*p0R
	Follow physical page	<Esc>*p1R
Display Functions	ON	<Esc>Y
	OFF	<Esc>Z
End-of-Line Wrap	Enabled	<Esc>&s0C
	Disabled	<Esc>&s1C

[25] Graphics (rectangular area fill) commands for PCL5e (continued)

Macro commands

Function	*Parameter*	*PCL command*
Macro ID	Macro ID	<Esc>&f#Y
Macro Control	Start Macro Definition	<Esc>&f0X
	Stop Macro Definition	<Esc>&f1X
	Execute Macro	<Esc>&f2X
	Call Macro	<Esc>&f3X
	Enable Overlay	<Esc>&f4X
	Disable Overlay	<Esc>&f5X
	Delete Macros	<Esc>&f6X
	Delete all Temporary Macros	<Esc>&f7X
	Delete Macro ID	<Esc>&f8X
	Make Temporary	<Esc>&f9X
	Make Permanent	<Esc>&f10X

[26] Macro commands for PCL5e

Note: *Macro commands are installable on the Hard Disk. For more information about this C-KOS settings refer to Océ Power Print Controller System Administration Manual.*

Not supported PCL commands

Command group	*function*	*PCL command*	*comment*
Page control	Page size	<esc>&l45A	jis b5
		<esc>&l46A	jis b4
		<esc>&l80A	env monarch
		<esc>&l81A	env comm10
		<esc>&l90A	env int DL
		<esc>&l91A	env intl C5
		<esc>&l100A	env intl B5
		<esc>&l101A	custom
	Character text path direction	<esc>&c#T	Special for asian text.
Alpha numeric ID	Alpha numeric ID	<esc>&n#W[operation][str]	
Font selection	Text parsing method	<esc>&t#P	Special for asian text
Status Readback	Location Type	<esc>*s#T	
	Location unit	<esc>*s#U	
	Inquiry status Readback entity	<esc>*s#I	
	Free Space	<esc>*s1M	
	Flush all pages	<esc>&r#F	
Miscellaneous	Configuration apple talk	<esc>&b#W data	

PJL command groups

The following table lists the PJL command groups, supported by the Océ Power Print Controller.

Command Group	*Command*	*Supported Syntax*	*Support*
Kernel Commands	UEL (Universal Exit Language)	<ESC>%-12345X	yes
	COMMENT	@PJL COMMENT remarks [<CR>] <LF>	no/ ignored
	ENTER	@PJL ENTER LANGUAGE = *personality* [<CR>]<LF>	no/ ignored
Environment Commands	DEFAULT	@PJL DEFAULT [LPARM: PCL] *variable* = *value* [<CR>] <LF>	yes
	SET	@PJL SET [LPARM: PCL] *variable* = *value* [<CR>] <LF>	yes
	INITIALIZE	@PJL INITIALIZE [<CR>] <LF>	yes
	RESET	@PJL RESET [<CR>] <LF>	yes
Job Separation Commands	JOB *	@PJL JOB [NAME=”name”] [start=#] [end=#]	**
	EOJ *	@PJL EOJ [NAME=”name”]	yes
Status Readback Commands	INQUIRE	@PJL INQUIRE [LPARM : PCL] *variable* [<CR>]<LF>	yes
	DINQUIRE	@PJL DINQUIRE [LPARM : PCL] *variable* [<CR>]<LF>	yes
	ECHO *	@PJL ECHO “words”	yes
	INFO STATUS *	@PJL INFO STATUS	yes
	INFO USTATUS	@PJL INFO USTATUS	yes
	USTATUS DEVICE *	@PJL USTATUS DEVICE=ON|OFF	yes
	USTATUS JOB *	@PJL USTATUS JOB=ON|OFF	yes
	USTATUS PAGE *	@PJL USTATUS PAGE=ON|OFF	yes
	USTATUSOFF *	@PJL USTATUSOFF	yes

[27] Supported PJL commands

Device Attendance Commands	RDYMSG	@PJL RDYMSG DISPLAY=”message”	no/ ignored
	OPMSG	@PJL OPMSG DISPLAY=”message”	no/ ignored
	STMSG	@PJL STMSG DISPLAY=”message”	no/ ignored
PJL File System Commands	FSDELETE	@PJL FSDELETE NAME=”pathname”	no/ ignored
	FSDOWNLOAD	@PJL FSDOWNLOAD FORMAT:BINARY [SIZE=#] [NAME=”pathname”] <binary data> <ESC>%-12345X	no/ ignored
	FSINIT	@PJL FSINIT VOLUME=”0:”	no/ ignored
	FSMKDIR	@PJL FSMKDIR NAME=”pathname”	no/ ignored

[27] Supported PJL commands

Note: ** The commands marked with an * are also supported for Limited PJL parsing.*

Note: *** Security (password option) is not supported for the ‘JOB’ command.*

A syntax that differs from above, but is conform to PJL specifications, (e.g. @PJL DEFAULT [IPARM: SERIAL] resolution=300 <LF>), will be ignored.

The following table lists the environment variables for the PJL ‘DEFAULT’ and PJL ‘SET’ command that are supported. The factory defaults are given in parenthesis.

Environment variable	*Variable values*	*Remarks*
DUPLEX	(OFF) / ON	
ORIENTATION	(PORTRAIT)/LANDSCAPE RPORTRAIT/RLANDSCAPE	
PAPER	LETTER/LEGAL_LARGE/ A4/A3/A5/LEDGER/ US_STANDARD/ LEGAL_SMALL/KWARTO /FOLIO/FOOLSCAP/ COMMERCIAL	

[28] Recognised environment variables

FORMLINES	5-128 (66)	
MANUALFEED	(OFF) / ON	
COPIES	1 to 32767 pages	
RESOLUTION	300/600	
FONTNUMBER	0 to n (maximum depends on the number of installed fonts) (24)	fontnumber = RO number on Status Report
PITCH	0.44 to 99.99 (10.00)	
PTSIZE	4.00 to 999.75 (12.00)	
SYMSET	0 to m (maximum depends on the number of installed symbol sets) (341)	symbolsetnumber = RO number on Status Report
JOBOFFSET	(OFF) / ON	enables jogging at PJL EOJ and EOF
FINISH	STAPLE / (NONE)	enables stapling at PJL EOJ and EOF
OCEBIN	(1) - maxbin	

[28] Recognised environment variables

HP-GL/2 commands

The following tables provide an overview of the HP-GL/2 commands supported by the Océ Power Print Controller Series.

Note: *Optional parameters are shown in brackets.*

Configuration and status group

Command	*Mnemonic*	*Parameter*
Advance Full Page	PG	[n];
Default Values	DF	;
Initialise	IN	[n];
Input P1 and P2	IP	[p1x,p2y[,p2x,p2y]];
Input Relative P1 and P2	IR	[p1x,p1y[,p2x,p2y]];
Input Window	IW	[xll,yll,wur,yur];
Rotate Coordinate System	RO	[angle];
Scale	SC	[xmin,xmax,ymin,ymax [,type[,left,bottom]]];or [xmin,xfac,ymin,yfac,type];

[29] Configuration and status group commands for HP-GL/2

Vector group

Command	*Mnemonic*	*Parameter*
Arc Absolute	AA	xcenter, ycenter, sweep angle [,chord angle];
ARC Relative	AR	xincr, yincr, sweep angle [,chord angle];
Absolute Arc Three Point	AT	xinter, yinter, xend, yend [,chord angle];
Pen Down	PD	[x,y...[x,y]];
Pen Up	PU	[x,y...[x,y]];
Plot Absolute	PA	[x,y...[x,y]];
Plot Relative	PR	[x,y...[x,y]];
Relative Arc Three Point	RT	xincr inter,yinc inter, xincr end, yincr end [,chord angle];
Polyline Encoded	PE	[flag[val] | coord pair... [flag[val] | coord pair...]]
Bezier Absolute	BZ	[x,y...[x,y]];
Bezier Relative	BR	[x,y...[x,y]];

[30] Vector group commands for HP-GL/2

Polygon group

Command	*Mnemonic*	*Parameter*
Circle	CI	radius [,chord angle];
Edge Polygon	EP	n/a
Edge Rectangle Absolute	EA	xcoord,ycoord;
Edge Rectangle Relative	ER	xincr,yincr;
Edge Wedge	EW	radius,start angle, sweep angle [,chord angle]
Fill Polygon	FP	n/a
Fill Rectangle Absolute	RA	xcoord,ycoord;
Fill Rectangle Relative	RR	xincr,yincr;
Fill Wedge	WG	radius,start angle,sweep angle [,chord angle];
Polygon Mode	PM	polygon definition;

[31] Polygon group commands for HP-GL/2

Line and fill attributes group

Command	*Mnemonic*	*Parameter*
Anchor Corner	AC	[xcoord,ycoord];
Fill Type	FT	[type[,option1[,option2]]];
Line Attributes	LA	[kind,value...[,kind,value]];
Line Type	LT	[line type [,pattern length[,mode]]];
Pen Width	PW	[width[,pen]];
Pen Width Unit Selection	WU	[type];
Raster Fill Definition	RF	[index,width,height,pen number...pen number]];
Fill Polygon Odd/Even	FP	[0|1];
Select pen	SP	[pen];
Symbol mode	SM	[char];
User Defined Line Type	UL	[index[,gap1...gapn]];

[32] Line and fill attributes group commands for HP-GL/2

Character group

Command	*Mnemonic*	*Parameter*
Absolute Character Size	SI	[width,height];
Absolute direction	DI	[run,rise];
Alternate Font Definition	AD	[kind,value...[,kind,value]];
Character Fill Mode	CF	[fill mode[,edge pen]];
Character Plot	CP	[spaces,lines];
Character Slant	SL	[tangent of angle];
Define Label Terminator	DT	[lbterm[,mode]];
Define Variable Text path	DV	[path[,line]];
Extra Space	ES	[width[,height]];
Label	LB	[char...[char]]lbterm;
Label Origin 1-9	LO	[position];
Label Origin 11-19	LO	[position];
Label Origin 21	LO	[position];
Relative Character Size	SR	[width,height];
Relative Direction	DR	[run,rise];
Scalable/Bitmapped Fonts	SB	0 or 1
Select Alternate Font	SA	;
Select Standard Font	SS	;
Select Primary Font	FI	Font ID
Select Secondary Font	FN	Font ID
Standard Font Definition	SD	[kind,value...[,kind,value]];
Transparent Data	TD	[mode];

[33] Character group commands for HP-GL/2

Palette extensions

Command	*Mnemonic*	*Parameter*
Transparency Mode	TR	0 or 1
Screened Vectors	SV	[screen type[,option1[option2]]];

[34] Palette extensions

Technical Graphics extensions

Command	*Mnemonic*	*Parameter*
Merge Control	MC	[mode, opcode]
Pixel Placement	PP	[mode]

[35] Technical Graphics extensions

Appendix A
Miscellaneous

Notation conventions

There are a number of notation conventions used in this manual. This consistent style enables you to quickly become conversant with the use of this manual and consequently the Océ Power Print Controller.

Description Each section or subsection contains a description of the feature or operation identified in the title. It might also include possible applications, as well as any guidelines that you should bear in mind.

Procedures A description is followed by a procedure. A procedure always begins with a phrase which briefly describes the procedure, followed by a series of numbered steps that take you, step by step, through all phases of performing the operation.

Figures and tables Figures and tables are titled and numbered sequentially throughout this manual. Figures include pictures of product components, screendumps, examples, and diagrams of concepts discussed in the description.

Attention getters There are several types of information to which we draw your attention. This information is classified as follows:

Note: *In a 'Note', information is given about matters which ensure the proper functioning of the machine or application, but useful advice concerning its operation may also be given.*

Attention: *The information that follows 'Attention' is given to prevent something (your copy or original, the copier or printer, data files etc.) being damaged.*

Caution: *The information that follows 'Caution' is given to prevent you suffering personal injury.*

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Have you found this manual to be accurate?
- ❑ Yes
- ❑ No

Could you operate the product after reading this manual?
- ❑ Yes
- ❑ No

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- ❑ Yes
- ❑ No

Is the format of this manual convenient in size, readability and arrangement (page layout, chapter order, etc.)?
- ❑ Yes
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- ❑ Always
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