
SAP Printing

Customer documentation

Volume 3 : [DC07]

Device-specific information

for

- Ricoh AP3200

Version: 1.11

Abstract:

This document contains device-specific information about the device hardware and accessories, the configurable features, related limitations, and the commands necessary to configure the settings in the device type.

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Important notice

Parts of this manual are subject to change without prior notice.

1. General Device Information

This chapter contains general information about the devices.

SAP device types to use:

- PCL-based **ZA0x**, ver 005+

Device / Model name:

• [DC07]	AP3200	
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Compatibilities/Emulation: HP PCL 5e

Firmware (PCL): **Note:** It is recommended to always use the latest firmware.

Speed: 32 ppm (A4 simplex)

Printer queue name lp

2. Device Hardware Accessories

This chapter contains information about the standard or optionally available hardware accessories of the devices. The Description column indicates the name of the unit, its properties, and, where applicable, the supported paper sizes and the sheet capacity. It also contains a list of features which can be configured on the device's front panel, as well as their initial factory defaults.

For more device-specific information, see also the device's corresponding Operating Instructions manual.

Device Hardware Accessories

Unit		Description
Memory (RAM)	standard optional	32 MB • [Type B] + 32 MB or 64 MB or 128 MB There is only one memory slot for the additional memory module. For Duplex printing, a minimum of 32 MB additional memory is necessary.
Hard Disk	optional	• [Type 185] - Capacity = 6 GB With this option Collation, Font download, Sample Print and Locked Print are possible.
Bypass ("Multi-bypass")	optional	(paper input) Bypass Tray unit • [BT270] - mounted at right-hand side - Capacity = 100 sheets - Paper = see (*)
Paper Bank		(paper input) additional input trays
- Tray 3&4 OR	optional	• [PS440] - mounted below Tray 2 - Capacity = 2 x 500 sheets (500 per tray) - Paper = see (*)
- Tray 3 ("LCT")	optional	• [PS420] - mounted below Tray 2 - Capacity = 2000 sheets - Paper = A4/LTR (LEF) only
Duplex unit	optional	(paper path) needed for duplexing • [AD380] - Paper = see (*) - Interchange unit is needed
Interchange unit	optional	(paper path) needed to attach Mailbox or Duplex unit to the device • [Type 280]
Mailbox	optional	(paper output) Mailbox
- 4-bin		• [CS370]

		- Interchange unit is needed; mounted on top of the Interchange unit - Capacity (# sheets) = 4 x 125 - Paper = see (*)
Bridge unit	optional	(paper path) • [Type 320] - Paper = 100 x 148 mm (Minimum); 305 x 432 mm (Maximum) - needed to attach Finisher
Finisher		(paper output) device to perform stapling and/or punching functions - Stapling: not all supported due to physical mechanism restrictions (see at each type below)
- Type 500	optional	• [SR510] - mounted at top-left of device - Bridge unit is needed - Capacity (# sheets) = 500 (A4,LTR) or 250 (A3,DLT) - Trays = has only Shift Tray, no Proof Tray - Staple capacity = - 30 sheets: A4 - B5, LTR - 20 sheets: A3 - B4, DLT, LGL - Staple orientation = only vertical
- Type 1000	optional	• [SR720] - mounted at top-left of device - Paper Tray Unit and Bridge unit are needed - Capacity (# sheets) = 1000 (A4,LTR) or 500 (A3,DLT) - Trays = has only Shift Tray, no Proof Tray - Staple capacity = - 30 sheets: A4 - B5, LTR, Executive, 16K - 20 sheets: A3 - B4, DLT, LGL, F, Foolscap, Folio, 8K - Staple orientation = only slanted

Note: (*) = See the corresponding Operating Instructions manual.

Features configurable on the device front panel

The following table specifies those features that can be configured from the device's front panel, and their initial factory default settings. For those features whose setting is typically unlikely to be changed often, they can be configured once on the device front panel, and thus need no configuration from the SAP system side.

Feature	Initial (factory) setting
• Resolution	600 dpi
• Edge Smoothing	On
• Symbol set	Roman-8
• Tray priority	Tray 1
• Duplex mode	Off
• Output Bin	Standard Tray
• Toner saver	Off

3. Features & Commands

This chapter contains one section for each configurable feature.

The features are ordered by importance (how often used) and logical order (in the processing of the job).

- 3.1 - 3.7 = likely to be configured / changed
- 3.8 - 3.13 = unlikely to be changed often
- 3.14 - 3.21 = changing makes no sense or has no effect, or it must or should not be changed
- 3.22 - ... = additional features

Each section contains the following information about the feature:

1. **Description** of the **Feature**
2. Table of all possible **Settings** for this feature, and the **Values** necessary to specify in the **Command(s)**.
An (*) indicates that the interpretation of a value is subject to some restriction.
3. **Dependencies/Constraints**, other remarks
4. (for each Printer language and each related Command):
 - a. **Tag** (this is used to clearly mark where the Command is located in the device type)
 - b. **Command syntax** (see Appendix 1 below for general information on the printer language)
 - c. **Initial** command (as an example, and as it is shipped in the device type)

The entire initial command sequence of a particular device type is listed in the corresponding Volume 2.

Note: (Print controls)

For some of those features that can be specified per page, paragraph, or character, Print controls are defined.

Where applicable, these are also listed in the Settings/Values table of the feature.

General remarks:

- The order in which the commands appear in the device type, and in which they are sent to the printer, is roughly the same as the one generated by our Windows drivers. To make sure the controller doesn't get problems, this order should be maintained. Please also note that some commands are sent automatically by the SAPscript driver, on which we cannot take any influence.
- Be aware that some settings may require modifications in more than 1 place !

SAP-specific syntax issues:

- A "#" at the beginning of a line is the SAP comment symbol. It means that the line will not be sent to the printer.
- Non-printable characters have to be entered as SAP escape characters.

Notation conventions:

- All commands are printed in fixed-spaced Courier font.
- The "^^^" indicates a place-holder for a value that has to be looked up from the Settings/Values table.
- <...> indicates a place-holder.
- A "###" in front of a line is to indicate that it should never be uncommented.
- [...] indicates optional text that can be omitted.

3.1 Input Bin

Description:

Specify the input bin from where to take the paper.

Settings/Values:

^^^ [PCL.01]	Print control	Interpretation	Capacity (# sheets)
0	TRYST	Print out current page from currently active input bin (remains unchanged)	--
7	--	Auto Tray Select	--
2	TRYMN	Bypass	50 or 100
8	TRY01	Tray 1	500
1	TRY02	Tray 2	500
4	TRY03	Tray 3 ("LCT") -- if [PS420]	2000
4	TRY03	Tray 3 -- if [PS440]	500
30	TRY04	Tray 4 -- if [PS440]	500

Dependencies/Constraints:

- Tray 3 (LCT) needs [PS420] Tray 3 unit
- Trays 3 & 4 need [PS440] Paper Bank unit
- The Bypass tray requires Bypass unit
- Bypass tray => no Duplex, no Stapling, no Punching, no Collation
- For the paper sizes supported by a particular bin, please see the corresponding Operating Instructions manual.
- Custom paper size and A6 only from Bypass
- LCT supports only A4 (LEF) or LTR (LEF)

Note: (Using the HPL2 ABAP list driver)

When using the HPL2 ABAP list driver, the PCL command for this setting will not become effective. You need to use the SAP mechanism to specify the Input Bin.

Note: (The SAP mechanism to specify the Input Bin)

• For ABAP & SmartForms:

Under SAP this setting can also be specified in the definition of the Output device.

The "Output attributes for list drivers" tab has a setting named "Paper tray".

The selectable values "Tray 1" | ... | "Tray 10" | "Single sheet" | "Envelopes" | "ManualEnvelope", correspond to the Print controls TRY01 | ... | TRY10 | TRYMN | TRYEN | TRYME.

This setting is only used by the HPL2 ABAP list driver.

If the standard ABAP list driver is used, the setting has to be specified in the command at [PCL.01] in the "Printer initialization" action in the Device type.

• For SAPscript:

The TRYxx print control to be used for a particular page can be specified in the definition of the Form used by the document, under "Page layout" -> <page> -> [Attributes] -> "Print attributes" -> "Resource name".

Note: (Forcing a particular Input bin for SAPscript)

As explained above, the desired input bin for SAPscript can be specified in the "Resource name" field of the definition of the SAPscript FORM. If it is not desired to assign a fixed input bin to a SAPscript FORM, then this field should be left empty, and the desired input bin should rather be specified in the "Printer initialization" action of the Device type, at tag [PCL.01]. This is, however, only possible if the SAPscript FORM does not specify an input bin yet. If the SAPscript FORM does already specify an input bin that is undesired, and if it cannot be changed, please contact Technical support for how to override it.

3.1.1 Tag: # [PCL.01] INPUT BIN

Command syntax:

- \e&l^{^^^}H

Initial / Example:

- #\e&l7H

3.2 Paper Type

Description:

Paper type (Media type) should be configured for two reasons:

1. Different paper quality and thickness may require a different fusing temperature. This is called **Fuser control**. This can be configured through the PJL FUSERCONTROL command.
2. The device keeps track of which paper type is contained in each input bin. When a certain paper type is specified in the print job, the controller can automatically select an appropriate input bin containing the requested paper type and paper size. This can be configured through the PCL command.

Settings/Values:

^^^ [PJL.04a]	^^^ [PCL.12]	Print control	Interpretation
(*1)	8WdSpecial	ZTSPC	Special paper
PLAINPAPER	6WdPlain	ZTPLN	Plain / Normal paper
(*1)	9WdRecycled	ZTRCY	Recycled paper
THICK	(*2)	--	Thick paper

Note:

- (*1): not supported by PJL
- (*2): not supported by PCL

Dependencies/Constraints:

- For the paper types supported by a particular bin, please see the corresponding Operating Instructions manual.

3.2.1 Tag: # [PJL.04] PAPER TYPE 1/2

Command syntax:

- @PJL SET FUSERCONTROL = ^^^ \r\n -- [PJL.04a]
- @PJL SET MEDIATYPE = ^^^ \r\n -- [PJL.04b] -- This command is NOT supported by this device.

Initial / Example:

- #@PJL SET FUSERCONTROL = PLAINPAPER \r\n
- #@PJL SET MEDIATYPE = PLAIN \r\n

3.2.2 Tag: # [PCL.12] PAPER TYPE 2/2

- \e&n^{^^^}

Note: The value ^{^^^} has the following structure: "<decimal length of keyword> W <keyword>"; the <keyword> starts with a "d".

Initial / Example:

- #\e&n6WdPlain

3.3 Duplex Mode

Description:

Duplex means printing on both sides of a sheet of paper.

Depending on the **Binding edge** (the edge of the page that would be used for binding the document), there are 2 different orientations of the rear page with respect to the orientation of the front page possible and necessary.

There are two different notions of indicating the binding edge.

- The notion of **Long-/Short-edge binding** is independent of the orientation of the contents of the pages.
- The notion of **Side (Left-edge) / Top binding** is related to the above through the orientation of the printout, as follows:

	Portrait	Landscape
Long-edge	Side	Top
Short-edge	Top	Side

Settings/Values:

^^^ [PJL.17a]	^^^ [PJL.17b]	^^^ [PCL.03]	Print control	Interpretation
OFF	--	0	SPMSI	Simplex
ON	LONGEDGE	1	SPMDU	Duplex, Long-edge binding
ON	SHORTEDGE	2	SPMTU	Duplex, Short-edge binding (Tumble)

Dependencies/Constraints:

- [P.JL.17b] is only interpreted if [P.JL.17a] is not "OFF".
- Duplexing requires a Duplex unit and an Interchange unit.
- Duplex is not possible from the Bypass Tray.
- For Stapling, Punching, Duplexing, Orientation, and Paper feed direction, only certain combinations make sense and are permitted. See chapter "Limitations" below.
- No duplexing for A6, Statement, Half Letter; envelopes and custom paper

Note: (Using the HPL2 ABAP list driver)

When using the HPL2 ABAP list driver, the PCL command for this setting will not become effective. You need to use the SAP mechanism to specify the Duplex mode.

Note: (The SAP mechanism to specify the Duplex mode)

• For ABAP & SmartForms:

Under SAP this setting can also be specified in the definition of the Output device.

The "Output attributes for list drivers" tab has a setting named "Print mode".

The selectable values are: DEFAULT, SIMPLEX, DUPLEX, and TUMBLE DUPLEX.

This setting is only used by the HPL2 ABAP list driver.

If the standard ABAP list driver is used, the setting has to be specified in the command at [PCL.03] in the "Printer initialization" action in the Device type.

• For SAPscript:

The Duplex mode to be used for a particular page can be specified in the definition of the Form used by the document, under "Page layout" -> <page> -> [Attributes] -> "Print attributes" -> "Print mode".

The selectable values are: <empty>, "S", "D", "T".

Note: (Forcing a particular Duplex mode for SAPscript)

As explained above, the desired duplex mode for SAPscript can be specified in the "Print mode" field of the definition of the SAPscript FORM. If it is not desired to assign a fixed duplex mode to a SAPscript FORM, then this field should be left empty, and the desired duplex mode should rather be specified in the "Printer initialization" action of the Device type, at tag [PCL.03]. This is, however, only possible if the SAPscript FORM does not specify a duplex mode yet. If the SAPscript FORM does already specify a duplex mode that is undesired, and if it cannot be changed, please contact Technical support for how to override it.

3.3.1 Tag: # [P.JL.17] DUPLEX MODE 1/2

These commands are not necessary.

Command syntax:

- @P.JL SET DUPLEX = ^^^ \r\n -- [P.JL.17a]
- @P.JL SET BINDING = ^^^ \r\n -- [P.JL.17b]

Initial / Example:

- #@P.JL SET DUPLEX = ON \r\n
- #@P.JL SET BINDING = LONGEDGE \r\n

Note: If both P.JL command and PCL command are sent, the PCL setting takes precedence over the P.JL setting.

3.3.2 Tag: # [PCL.03] DUPLEX MODE 2/2**Command syntax:**

- \e&l^^^S

Initial / Example:

- #\e&l0S

3.4 Output Bin

Description:

The output receptacle (bin, tray) for the printed paper.

Settings/Values:

^^^ [P.JL.16]	^^^ [PCL.02]	Print control	Interpretation	Capacity (# sheets)
--	0	--	Default output tray (as specified from the device's front panel)	--
UPPER	1	TROST TRO01	Standard Tray [if no Mailbox is attached]	500
OPTIONALOUTPUTBIN1	4	TRO11	Standard Tray [if a Mailbox is attached]	500
OPTIONALOUTPUTBIN2	5	TRO12	Mailbox Tray 1	125
OPTIONALOUTPUTBIN3	6	TRO13	Mailbox Tray 2	125
OPTIONALOUTPUTBIN4	7	TRO14	Mailbox Tray 3	125
OPTIONALOUTPUTBIN5	8	TRO15	Mailbox Tray 4	125

FINISHERSHIFT	101	TRO03	Finisher Shift Tray	[SR510]: 500 [SR720]: 1000
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Dependencies/Constraints:

- Finisher trays require a Finisher unit.
- Mailbox trays require a Mailbox unit.
- For the paper sizes supported by a particular bin, please see the corresponding Operating Instructions manual.

Note: (Using the HPL2 ABAP list driver)

When using the HPL2 ABAP list driver, you need to use the P JL command for this setting.

3.4.1 Tag: # [P JL.16] OUTPUT BIN 1/2**Command syntax:**

- @P JL SET OUTBIN = ^^^ \r\n

Initial / Example:

- #@P JL SET OUTBIN = UPPER \r\n

Note: If both P JL and P CL commands are sent, the P CL setting takes precedence over the P JL setting.

3.4.2 Tag: # [P CL.02] OUTPUT BIN 2/2**Command syntax:**

- \e&l^^^G

Initial / Example:

- #\e&l1G

3.5 Job Offset

Description:

There are several mechanisms conceivable to separate multiple copies of the same job. Job offset can be configured for each job individually through the P JL JOBOFFSET command. In either case, two consecutive stacks of output can be separated through sheet **rotation** or **shifting**.

Settings/Values:

^^^ [P JL.13]	Interpretation
OFF	No offset.
ROTATE	Output is rotated versus the previous, by just switching between LEF and SEF paper.
SHIFT	Output is offset side-wise versus the previous.

Dependencies/Constraints:

- ROTATE requires also to set "Input bin" = "Auto Tray Select", and that paper of the specified paper size is available in the input trays in both feed directions (LEF & SEF).
- Rotation is only supported on the Mailbox trays.
- Shifting requires a Finisher Shift Tray.
- The Finisher Shift Tray always applies Shifting.
- Stapled output is not shifted.

3.5.1 Tag: # [P JL.13] JOB OFFSET**Command syntax:**

- @P JL SET JOBOFFSET = ^^^ \r\n

Initial / Example:

- #@P JL SET JOBOFFSET = OFF \r\n

3.6 Stapling

Description:

Set the Stapling mode. Paper output can be stapled automatically. One can configure the **number** of staples (1/2), and their **position** (at which corner/edge) and **orientation** (vertical/horizontal/slanted). The command to be used also depends on the orientation of the document.

The stapling unit is part of the Finisher unit.

Due to mechanical reasons of the stapling unit, only certain modes are possible. See also the device's corresponding Operating Instructions manual.

The **physical** position and orientation of the staple(s) is determined and possibly restricted by the mechanism of the punching unit.

However, the printer controller can implement multiple **logical** staple positions and orientations, by combining the physical possibilities, the choice of SEF/LEF paper, and the orientation of the page (e.g. by making a 180 degree rotation).

E.g. "Top-Left Vertical (Portrait)" and "Top-Right Horizontal (Landscape)" actually use the same physical position and orientation of the staple.

Note:

The indicated orientation of the document should match the actual orientation of the printout. Otherwise, the result may not make much sense.

E.g. if a Portrait document is printed with the command for "Top-Left Horizontal (Landscape)", the result will actually appear as "Bottom-Left Vertical (Portrait)", which is not useful.

Note: The TITLE action should not specify any commands for Stapling, because the Cover page is only 1 page.

Settings/Values:

^^^ [PJL.02]	Interpretation	#	Position of staple(s)	Orientation of staple(s)	Document orientation	Paper feed direction required
OFF	off / no stapling	--	--	--		--
LEFTTOPHORIZPORT	LHP (*)	1	Top-Left	Horizontal	(Portrait)	SEF
LEFTTOPHORIZLAND	LHL (*)	1	Top-Left	Horizontal	(Landscape)	LEF
RIGHTTOPVERTPORT	RVP (*)	1	Top-Right	Vertical	(Portrait)	LEF
RIGHTTOPVERTLAND	RVL (*)	1	Top-Right	Vertical	(Landscape)	SEF
LEFTTOPSLANTPORT	LSP (**)	1	Top-Left	Slanted	(Portrait)	LEF
LEFTTOPSLANTLAND	LSL (**)	1	Top-Left	Slanted	(Landscape)	SEF
RIGHTTOPSLANTPORT	RSP (**)	1	Top-Right	Slanted	(Portrait)	SEF
RIGHTTOPSLANTLAND	RSL (**)	1	Top-Right	Slanted	(Landscape)	LEF

Dependencies/Constraints:

- Stapling requires that a Finisher Unit be installed
- Stapling requires the following setting: "Output bin" = "Finisher Shift Tray"
- Bypass Tray => no Stapling
- For Stapling, Duplexing, Orientation, and Paper feed direction, only certain combinations make sense and are permitted. See chapter "Limitations" below.
- Multiple copies should always be specified as Collated.
- The Input bin should be set to Auto Select, or it must be ensured that the paper in the tray is set in the correct paper feed direction.
- The paper supported and the maximum number of sheets that can be stapled are specified in the chapter "Device Hardware Accessories" above.
- (*) The Finisher Type 500 supports only those modes marked.
- (**) The Finisher Type 1000 supports only those modes marked (slanted only).
- No stapling for A5, A6, B6, Postcard.

Note:

It is recommended to always explicitly specify the Duplex mode, as indicated in the section "Duplex mode" above, in order to override any existing Duplex mode setting on the device, which could be in conflict to the desired Stapling mode.

3.6.1 Tag: # [PJL.02] STAPLING MODE

Command syntax:

- @PJL SET STAPLE = ^^^ \r\n

Initial / Example:

- #@PJL SET STAPLE = OFF \r\n

3.7 Punching

This feature is NOT supported by this device.

3.7.1 Tag: # [PJL.03] PUNCHING MODE

These commands are NOT supported by this device.

3.8 Resolution

Description:

By default, the horizontal and vertical printer resolution, in dots per inch (dpi), is 600 dpi.

In case of memory or speed problems, or for draft prints, you may wish to switch to 300 dpi.

If resolution is changed, the memory is reconfigured, and all downloaded fonts and PCL macros are lost.

Settings/Values:

^^^ [*]	Interpretation
600	600 dpi
300	300 dpi

Note: (*): The same value must be set at both places !

3.8.1 Tag: # [PJL.01] RESOLUTION 1/2

Command syntax:

- @PJL SET RESOLUTION = ^^^ \n

Initial / Example:

- @PJL SET RESOLUTION = 600 \n

3.8.2 Tag: # [PCL.14] RESOLUTION 2/2

Command syntax:

- \e&u^^^D

Initial / Example:

- \e&u600D

3.9 Copies

Description:

Number of copies to print of this job.

For example, for 4 copies of a 3-page document,

- **Uncollated** copies will appear as 1,1,1,1,2,2,2,2,3,3,3,3.
- **Collated** copies will appear as 1,2,3,1,2,3,1,2,3,1,2,3.

Settings/Values:

^^ = { 1, . . . , 999 }

Dependencies/Constraints:

- Collation => requires an internal Hard Disk unit or optional memory (RAM).
- Bypass Tray => no Collation
- Please note that this may conflict with some SAP Output Management System software.

Note: (PCL/PJL)

There are two PJL commands and one PCL command related to specifying the number of copies and the collation mode.

Initially, both PJL commands are commented out, and the PCL command specifies 1 copy.

If either PJL command is used, the other one and the PCL command need to be commented out to avoid conflicts.

For Collated mode, the PJL QTY command is needed.

For Uncollated mode, the PCL command must be used. This device does NOT support the PJL COPIES command.

If both PJL and PCL commands are used, the PCL setting will override the PJL setting.

If the HPL2 ABAP list driver is used, it will override any Copies setting.

Note: (Increasing the performance of network printers)

It is possible to specify the desired number of copies directly in the print data stream, using one of the commands below. Since the spool system cannot know the contents of the data stream, it has to be told explicitly that N = 1, to avoid any conflict.

If a certain class of print jobs always requires the same fixed number of copies, the administrator may choose

1. to create a dedicated device type which sends the appropriate command, and
2. to tell his users to always keep N = 1 in the Print parameters dialog.

Note: The above does not work in conjunction with the HPL2 ABAP list driver, since it overrides this setting; it always forces only 1 copy.

3.9.1 Tag: # [PJL.15] COPIES 1/2

Command syntax:

- @PJL SET QTY = ^^^ \r\n -- **[PJL.15a]** (for Collated)
- @PJL SET COPIES = ^^^ \r\n -- **[PJL.15b]** -- This command is NOT supported by this device.

Initial / Example:

- #@PJL SET QTY = 1 \r\n

- #@PJL SET COPIES = 1 \r\n

3.9.2 Tag: # [PCL.13] COPIES 2/2

Command syntax:

- \e&l^^^X

Note:

This PCL command will just print uncollated copies.
It needs to be commented out if one of the above PJL commands is used.

Initial / Example:

- \e&l1X

3.10 EconoMode (Toner Saver)

Description:

For draft printouts, the EconoMode can be activated to save toner.
For normal operation, this feature should be deactivated.

Settings/Values:

^^^ [PJL.14]	Interpretation
OFF	disabled (normal printing)
ON	enabled

3.10.1 Tag: # [PJL.14] ECONOMODE (TONER SAVER)

Command syntax:

- @PJL SET ECONOMODE = ^^^ \r\n

Initial / Example:

- #@PJL SET ECONOMODE = OFF \r\n

3.11 Auto Tray Change/Switching

Description:

If enabled, and the current tray runs out of paper, the job will be continued from a tray containing the same paper size.
If disabled, the front panel LCD will prompt the user to refill paper and wait.
This should be disabled in case there are e.g. 2 different types of A4 paper (e.g. normal, colored) which should not be mixed.

This feature is always enabled on this device!

3.11.1 Tag: # [PJL.12] AUTOTRAYCHANGE

This command is NOT supported by this device.

3.12 Edge Smoothing/Enhancement

Description:

If Edge smoothing/enhancement is enabled, the controller will ameliorate the contours of font glyphs.
This should only be disabled in case of performance problems.

Settings/Values:

^^^ [PJL.11]	Interpretation
OFF	disabled
ON	enabled

3.12.1 Tag: # [PJL.11] SMOOTHING

Command syntax:

- @PJL SET SMOOTHING = ^^^ \r\n
- @PJL SET RET = ^^^ \r\n

- [PJL.11a]
- [PJL.11b] -- This command is NOT supported by this device.

Initial / Example:

- #@PJL SET SMOOTHING = ON \r\n
- #@PJL SET RET = ON \r\n

3.13 Page Protection

This feature is NOT supported by this device.

3.13.1 Tag: # [PJL.06] PAGE PROTECTION

This command is NOT supported by this device.

3.14 Paper Size

Description:

Determines the paper size to be used for the current page.

The **physical height** and **width** of the sheet or envelope are specified below.

The engine's mechanics implies an unprintable area near the edges, so that the **imageable area** is usually smaller. This is device-dependent.

Paper may be treated differently, depending on with which edge the sheets are fed into the paper path (**feed direction**).

- **LEF** = Long-edge-feed
- **SEF** = Short-edge-feed

(This notion of feed direction is independent of the notion of orientation.)

In the paper sizes below the first value specified is the feed edge.

Note: (Configuring the Paper size)

This setting cannot be configured effectively in the "Printer initialization" action of the device type, because there are other mechanisms which would override it.

For a **SAPscript** document, its paper size is configured in the "Page format" setting in the SAPscript Form used by the document, which in turn determines the Device format to be used. For the SAP standard paper sizes (A3, A4, A5, Letter, Legal, Executive), the command sent is built in the HPL2 SAPscript OTF driver, otherwise (for non-standard paper sizes) it has to be specified at the end of the Printer initialization action of the corresponding Device format.

For an **ABAP** report, the paper size to be used is always assumed to be A4 or Letter; however, the "Printer initialization" action does not send any paper size command.

In any case, the command syntax is explained below.

Note: ("Sub paper size")

Normally, a print job specifying a certain paper size would require that paper of this size be loaded in a tray.

If paper of this size is not available in any tray, the user will be requested via the device's front panel to load it.

Since A4 and Letter have similar formats, it may be desirable to be able to print a job specifying Letter format on A4 paper, or vice versa. This feature is called "Sub(stitute) paper size". There is no scaling applied; so if the image is too large, it will be cropped at the margins.

This feature can only be set via the device's front panel (Sub Paper Size = Auto); there is no PJL command to achieve this.

Settings/Values:

^^^	Name (short)	Full / Alternative names	EU/US	Size
27	A3	DIN A3 ((SEF))	EU	297 x 420 mm
26	A4	DIN A4 (LEF) DIN A4 (SEF), A4R	EU	297 x 210 mm 210 x 297 mm
2000	A5 A5R	DIN A5 (SEF) DIN A5 (LEF)	EU	148 x 210 mm 210 x 148 mm
2001	A6	DIN A6	EU	105 x 148 mm
46	B4	B4(JIS)	EU	257 x 364 mm
45	B5	B5(JIS)	EU	182 x 257 mm
6	Ledger	DLT, Double Letter, Tabloid ((SEF))	US	11" x 17"
3	Legal	LGL, Legal ((SEF))	US	8.5" x 14"
2	Letter	LTR, Letter ((LEF,SEF))	US	8.5" x 11"
1	Executive	Executive ((LEF,SEF))	US	7.25" x 10.5"
2008	Statement	HLT, Half Letter	US	5.5" x 8.5"
2012	Folio	F4	US	8.25" x 13"
2011	F/GL	F, Folio GL	US	8" x 13"
2007	Foolscap	Foolscap, Folio, F4, Government Legal	US	8.5" x 13"
81	Com-10	Envelope Commercial #10	US	4.125" x 9.5"
80	Monarch	Envelope Monarch, Commercial #7 3/4	US	3.875" x 7.5"
90	DL	Envelope International DL (Designated Long)	EU	110 x 220 mm
91	C5	Envelope C5	EU	162 x 229 mm
2022	C6	Envelope C6	EU	114 x 162 mm
2030	8K	8Kai	EU/US	267 x 390 mm

2031	16K	16Kai	EU/US	195 x 267 mm
101	Custom	Custom / User-defined	--	--

Dependencies / Constraints:

- Some input bins and output bins support only certain paper sizes, and some only in a certain feed direction. See the sections about Input bins and Output bins and the chapter "Device Hardware Accessories" above.
- If no paper select command is sent, the controller will use the paper in the addressed tray, or it may ask to load the paper which is currently specified as default.

Note: (Support of paper sizes by SAP)

Only the entries marked bold are currently fully supported as standard under SAP.

For the procedure on how to support a non-standard paper size, see the corresponding section in Volume 2, Appendix 1.

Note: (Printing envelopes)

To print an envelope, you need to specify these commands:

- (Input bin): The command for the Bypass tray.
- (Paper size): The command indicated in this section.
- (Orientation): Please note that all envelope sizes require Landscape orientation.

Command syntax:

- \e&l^^^A

Example:

- \e&l26A

3.15 Orientation

Description:

The orientation defines how the printed output appears on the physical paper. By definition, "Portrait" means that, in order to read the text, the sheet must be held upright, i.e. with the short edge at the top. (This notion is independent of the notion of paper feed direction.)

Note: (Configuring the Orientation)

This setting cannot be configured effectively in the "Printer initialization" action of the device type, because there are other mechanisms which would override it.

For a **SAPscript** document, its orientation is configured in the "Orientation" setting in the SAPscript Form used by the document. The command is automatically sent by the HPL2 SAPscript OTF driver, using the Print controls SPORT and SLAND, after the command sequence of the "Printer initialization" action. Therefore, the "Printer initialization" action should not send any commands to specify orientation.

For an **ABAP** report, the orientation is a property of the Device format (X_II_cc), which in turn is determined by the number of lines per page and the number of columns. The necessary PCL command is contained at the end of the "Printer initialization" action.

In any case, the command syntax is explained below.

Settings/Values:

	^^^	Interpretation
	0	Portrait (P)
	1	Landscape (L)

Note: The values are the digits 0,1, NOT the letters O,l.

Dependencies/Constraints:

- For Stapling, Punching, Duplexing, Orientation, and Paper feed direction, only certain combinations make sense and are permitted. See the chapter "Limitations" below.

Command syntax:

- \e&l^^^O

Note: The last character is the uppercase letter "O".

Example:

- \e&l100

3.16 Left margin

Description:

The left margin of the page.

Note: (Configuring the Left margin)

This setting cannot be configured effectively in the "Printer initialization" action of the device type, because there are other mechanisms which would override it.

For a SAPscript document, the horizontal margins are automatically cleared (set to 0) by the HPL2 SAPscript OTF driver, sending the command "<ESC>9" after the command sequence of the "Printer initialization" action.

For an ABAP report, the horizontal margins are automatically cleared (set to 0) when using the HPL2 ABAP list driver. Otherwise no command is sent.

In any case, the command syntax is explained below.

Settings/Values:

AAA	Interpretation
{ 0,1,... }	Number of columns (as defined by the current HMI)

Command syntax:

- \e&a^^^L

Example:

- \e&a5L

3.17 Top margin

Description:

The top margin of the page.

Note: (Configuring the Top margin)

This setting cannot be configured effectively in the "Printer initialization" action of the device type, because there are other mechanisms which would override it.

For a SAPscript document, the top margin is automatically cleared (set to 0) by the HPL2 SAPscript OTF driver, sending the command "<ESC>&10E" after the command sequence of the "Printer initialization" action.

For an ABAP report, the top margin is automatically cleared (set to 0) when using the HPL2 ABAP list driver. Otherwise no command is sent. In any case, the command syntax is explained below.

Settings/Values:

AAA	Interpretation
{ 0,1,... }	Number of lines (as defined by the current VMI)

Command syntax:

- \e&l^^^E

Example:

- \e&l1E

3.18 Horizontal spacing

Description: (PCL)

The horizontal spacing defines the distance between two adjacent characters.

In a proportional font, it affects only the width of the space character.

The current horizontal spacing is kept in a variable called **HMI** (Horizontal Motion Index).

It has to be specified as an absolute measure in 1/120 inch.

This determines the number of characters per inch (**cpi**).

The default HMI is = 12/120" = 10 cpi.

Note: (Configuring the Horizontal spacing)

This setting cannot be configured effectively in the "Printer initialization" action of the device type, because there are other mechanisms which would override it. Moreover, after any font select command the HMI is automatically set to a (font-specific) default, and therefore it needs to be specified again.

For a SAPscript document, the horizontal spacing is specified by the HPL2 OTF driver automatically after each font select command of a proportional font (thus only affecting the width of the space character). For fixed-spaced fonts, no command is sent; thus the default pitch of the selected font will be used.

For an ABAP report, the "Printer initialization" action of an X_II_cc Format contains a command to override the default pitch of the font used (Courier), thus condensing or expanding it to just the right size so that cc columns will fit properly on the page. The HPL2 ABAP list driver sends the command automatically.

In any case, the command syntax is explained below.

Settings/Values:

AAA	Interpretation
{ <any rational number> }	absolute measure in 1/120 inch

Command syntax:

- \e&k^^^H

Example:

- \e&k12H

3.19 Vertical spacing

Description: (PCL)

The vertical spacing defines the distance between two adjacent lines.
The current vertical spacing is kept in a variable called **VMI** (Vertical Motion Index).
It can be specified as number of lines per inch (**lpi**).
The default VMI is $= 8/48" = 6 \text{ lpi}$.

Note: ([Configuring the Vertical spacing](#))

This setting cannot be configured effectively in the "Printer initialization" action of the device type, because there are other mechanisms which would override it.
For a [SAPscript](#) document, the vertical spacing is initially set to 0 by the HPL2 SAPscript OTF driver, using the command "<ESC>&10C".
For an [ABAP](#) report, the necessary command is contained at the end of the "Printer initialization" action of the format. The HPL2 ABAP list driver overrides this, setting it to 0.
In any case, the command syntax is explained below.

Settings/Values:

AAA	Interpretation
{ 1, 2, 3, 4, 6, 8, 12, 16, 24, 48 }	number of lines per inch (lpi)

Command syntax:

- \e&l^^^D

Example:

- \e&l6D

3.20 Character set

Description:

Select/change the active printer character set.
This term is also known as "symbol set" (HP) or "code page" (Microsoft).
It is a table that interprets ASCII codes as characters.

Note: ([Configuring the Character set](#))

This setting is not a property of the job or a page but of individual characters. Nor is it an attribute of the font, it is maintained independently. It would make sense to specify an initial value in the "Printer initialization" action of the device type, but it could be overridden at any time.
In a [SAPscript](#) document, the character set can be switched by sending an appropriate Print control. (This is currently not implemented.)
This setting is also overridden by the SFxxx font select Print controls issued by the HPL2 SAPscript OTF driver.
For an [ABAP](#) report, the initial character set to be used is specified at the end of the "Printer initialization" action.
In any case, the command syntax is explained below.

Settings/Values:

AAA	Interpretation
0N	Latin-1 (ISO 8859-1)
2N	Latin-2 (ISO 8859-2)

For the initial setting, see the Example below.

Dependencies/Constraints:

- none

Note: ([Switching the Character set](#))

At the moment it is not possible to switch between character sets, e.g. to mix both Latin-1 and Latin-2 in the same document.

Note: ([Support of the EURO character](#))

The EURO character (€) has been implemented in the symbol sets 19U (Latin-1), 9E (Latin-2), for most typefaces, except LinePrinter, at position 80 (hex).

For this device the resident fonts support the EURO character.
To find out if the device type supports the EURO character, please see Volume 2.

Command syntax:

- \e(^^^

Example:

- \e(0N -- for ZA0x1vvv
- \e(2N -- for ZA0x2vvv

3.21 Font

Description:

Selects the font to be used, by specifying the following parameters:

- `^^^p` = proportional
- `^^^h` = pitch (cpi)
- `^^^v` = font height (point size)
- `^^^s` = style (italic)
- `^^^b` = weight (bold)
- `^^^T` = typeface

Note: (Selecting a font & Configuring font attributes)

This setting is not a property of the job or a page but of individual characters.

It doesn't make sense to specify an initial value in the "Printer initialization" action of the device type, since it will be overridden.

In a SAPscript document, the font to be used for a portion of text is specified by preceding the text with a 2-character tag which is defined as a Character format or Paragraph format in the Form or Style used by the document. The tag maps to a system font and thus to a SFxxx Print control and thus eventually to a font select PDL command sequence.

For an ABAP report, only a fixed-spaced font can be used, in this case COURIER. The font size depends on the format chosen, and it is specified in the "Printer initialization" action of the Device format. The HPL2 ABAP list driver has its own mechanism.

In any case, the command syntax is explained below.

There are no Print controls for changing/specifying a font attribute, because using them would conflict with the existing mechanisms.

Note: (OCR text printing)

Printing OCR text requires a separate solution. Please refer to the chapter "Barcodes & OCR Text" in Volume 2 for more information.

Note: (Barcode printing)

Printing barcodes requires a separate solution. Please refer to the chapter "Barcodes & OCR Text" in Volume 2 for more information.

Note: (Arbitrary size fonts)

For printing fonts in arbitrary sizes, please refer to the chapter "The Fonts" in Volume 2 [ZA0x].

Settings/Values:

Please refer to proper PCL documentation.

Note: The pitch command (`<ESC>&k#H`) must be respecified after any font select command. Otherwise a (font-specific) default is used.

Note: LinePrinter supports only symbol sets 0N, 2N.

Command syntax:

- `\e(s^^^p^^^h^^^v^^^s^^^b^^^T`

Example:

- `\e(s0p10h12v0s0b4099T` -- This would select normal Courier 10 cpi 12 pt.

3.22 Color printing

This feature is NOT supported by this device.

3.22.1 **Tag: # [PCL.30] COLOR : COLOR MODE**

This command is NOT supported by this device.

3.23 Slip sheet

This feature is NOT directly supported by this device. If you still need this feature under SAP, please contact support for a workaround.

3.23.1 **Tag: # [PJL.20] SLIPSHEET**

This command is NOT supported by this device.

3.25 Edge-to-Edge Mode

This feature is NOT supported by this device.

3.25.1 Tag: # [PJL.07] EDGE-TO-EDGE MODE

This command is NOT supported by this device.

3.26 USERCODE**Description:**

The USERCODE feature allows to tag a print job with a numeric code which identifies the job as having been issued by a certain individual (user) or organizational unit (department, etc.).

This can be used for accounting or billing purposes, for usage statistics, or for user authentication.

For how to register the codes on the devices and how to evaluate the statistics, refer to the corresponding Operating Instructions manual.

Settings/Values:

The length of the code is max. 8 digits.

The surrounding double-quotes (") are mandatory.

The value of the code can be specified as static/fixed or as dynamic/variable.

In our ZAxX Device type, initially a fixed value is specified as an example.

For how to assign variable codes dynamically at print time, please contact technical support.

Dependencies/Constraints:

- If the value is too long (> 8 digits), it will not be truncated, but the parameter will be empty !
- If the value contains an invalid character, i.e. a non-digit, the parameter will be empty !

3.26.1 Tag: # [PJL.24] USERCODE**Command syntax:**

- @PJL SET USERCODE = "<usercode>" \r\n

Initial / Example:

- #@PJL SET USERCODE = "01234567" \r\n

4. Limitations

This chapter contains device-specific or controller-specific limitations related to combinations of several features.

For **device-specific limitations of a single feature**, see under "Dependencies/Constraints" of the corresponding section above.

For **device-independent limitations** related only to the SAP device type used, please refer to the "Limitations" chapter of the corresponding Volume 2.

4.1 Combinations of Feed direction, Orientation, Duplex, Stapling

For Stapling, Duplexing, Orientation, and Paper feed direction, only certain combinations make sense and are permitted.

The mechanics of the stapling and punching units are such that they can only operate on the far edge in the paper path (the one that leaves the path last). This results in the restrictions on paper feed direction as indicated in the above sections for stapling and punching.

The 10 most common and reasonable combinations are summarized in the table below:

(All images are in readable orientation. The arrow indicates the edge that leaves the printer first.)

Note: (Feed direction required for desired Stapling mode)

If the paper is not available in the feed direction required for stapling in the desired mode (combination of position and orientation of staple(s)), the controller reacts as follows:

If the Input tray is explicitly specified as a particular tray, it will print anyway, but unstapled.

If Auto tray select or no input tray is specified, it will ask to load paper in the required feed direction, and wait (user intervention).

Image	Orientation	Binding edge	Stapling	Feed direction	Remarks
	Portrait	Top / Short	LHP	SEF	(*)
	Landscape	Top / Long	LHL	LEF	(*)

	Portrait	Side / Long	LSP	LEF	(**)
	Landscape	Side / Short	LSL	SEF	(**)

Note:

- Finisher Type 500 supports only those marked (*).
- Finisher Type 1000 supports only those marked (**).
- The following paper sizes cannot be stapled at the Top edge (Landscape) or the Left edge (Portrait), because they cannot be fed in LEF direction: A3, Double Letter, Legal.

4.2 Other

None.

5. (Appendix 1): Printer Languages

This chapter gives a brief introduction of each printer language used by the printer controllers of our devices.

5.1 PCL

The HP **PCL Printer Language** (PCL) is a **page description language** (PDL). That means it is used to specify the contents and format of a page.

The general syntax of a PCL command is:

- <ESC> <character> <letter> <value> <letter>

Note:

- Please be aware that the syntax is case-sensitive.
- In "\e&l^^^H" etc., "l" is the lowercase letter "L" not the digit "1" !
- In "\e&l^^^O" etc., "o" is the uppercase letter "O" not the digit "0" !
- Do NOT introduce any extra blanks.

PCL5e is the version that most of our black-and-white devices use.

PCL5c is the version that our color devices use.

For detailed information, please refer to the "PCL5 Printer Language Technical Reference Manual" from HP.

5.1.1 PCL macros

PCL allows to define and execute **macros**. A macro is identified by a number (<#>).

- <ESC>&f<#>y0X start define macro #
- <ESC>&f<#>y1X stop define macro #
- <ESC>&f<#>y2X execute macro #
- <ESC>&f<#>y3X call macro #

5.2 PJI

The HP **Printer Job Language** (PJI) is a **job control language**.

That means it controls parameters of a whole job, not of individual pages.

Normally all PJI commands are sent at the beginning of a job, and then it switches to some page description language.

The general syntax of a PJI command is:

- @PJI SET <keyword> = <value> [<CR>]<LF>

Note:

- Please be aware that the syntax is case-sensitive.
- The white spaces in front of and behind the "=" sign are optional.
- Do NOT introduce any blanks behind the <CR><LF>.

For detailed information, please refer to the "PJI Technical Reference Manual" from HP.