

EPSON®

Programming Guide

**For
6 Color
EPSON Ink Jet Printer**

**EP-4004
Artisan 1430
Stylus Photo 1430W/1500W**

(Level I)

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TABLE OF CONTENTS:

CHAPTER 1 : INTRODUCTION	5
1.1. Features	5
CHAPTER 2 : PAPER TYPES AND SIZES MEDIA SPECIFICATION.....	6
2.1. Paper Sizes for the EP-4004/Artisan 1430/Stylus Photo 1430W/1500W.....	6
2.2. Paper Size and Orientation	9
2.3. Printable Area.....	11
2.3.1. Printing Area (Standard).....	13
2.3.2. Printing Area (Zero margin / Borderless).....	15
2.4. Enable paper size of zero margin printing.....	16
2.5. Printing Area (CD-R)	17
CHAPTER 3 : PRINTING OPTION	18
3.1. Printing Quality	18
3.2. Recommended Settings for Color and Monochrome Printing.....	19
3.2.1. Recommended Setting Modes (Color&Black) for Japan.....	19
3.2.2. Recommended Setting Mode for Driver (Color & Black) <Windows/Over sea>	20
3.2.3. Recommended Setting Modes (Color & Black) <Macintosh/Over sea>	21
CHAPTER 4 : COMMAND SEQUENCE	22
4.1. Raster Graphics Modes	22
4.2. Command Transfer Procedure.....	23
4.2.1. Command transfer sequence for non-compressed and the run-length encoded compression modes.....	23
4.3. Limitations of Command Settings.....	25
CHAPTER 5 : INDIVIDUAL COMMAND SPECIFICATIONS	26
5.1.1. Exit Packet Mode	26
5.1.2. Initialize printer ESC @	27
5.1.3. Line feed LF.....	28
5.1.4. Form feed FF.....	29
5.1.5. Carriage Return CR.....	30
5.1.6. Control paper loading/ejecting ESC EM n.....	31
5.1.7. Set absolute horizontal print position ESC (\$ nL nH m1 m2 m3 m4.....	32
5.1.8. Set page length in defined unit (extended) ESC (C nL nH m1 m2 m3 m4	33
5.1.9. Set unit (extended) ESC (U nL nH P V H mL mH	34
5.1.10. Set absolute vertical print position (extended) ESC (V nL nH m1 m2 m3 m4.....	35
5.1.11. Set page format (extended) ESC (c nL nH t1 t2 t3 t4 b1 b2 b3 b4	36
5.1.12. Monochrome Mode / Color Mode Selection ESC (K nL nH m n.....	37
5.1.13. Selects dot size ESC (e nL nH m d.....	38
5.1.14. Set relative vertical print position (extended) ESC (v nL nH m1 m2 m3 m4.....	39
5.1.15. Print raster graphics ESC . c v h m nL nH d1...dk (c=0,1)	40
5.1.16. Set paper dimensions ESC (S nL nH w1 w2 w3 w4 l1 l2 l3 l4.....	42
5.1.17. Set the raster image resolution ESC (D nL nH rL rH v h	43
5.1.18. Transfer Raster image ESC i r c b nL nH mL mH d1.....dk.....	44
5.1.19. Turn unidirectional mode on/off ESC U n.....	45
5.1.20. Set relative horizontal print position ESC (/ nL nH n1 n2 m1 m2.....	46
5.1.21. Set Print method ID ESC (m nL nH n	47
CHAPTER 6 : REMOTE MODE	49
6.1. Remote Mode Language Description.....	49
6.1.1. Enter Remote Mode (Remote Mode) ESC (R 08H 00H 00H "REMOTE1"	51
6.1.2. Load Power-On Default NVR into RAM (Remote Mode) "LD" 00H 00H.....	52
6.1.3. Set printer timer (Remote Mode) "TI" 08H 00H 00H YYYY MM DD hh mm ss	53
6.1.4. Set horizontal print position (Remote Mode) "FP" 03H 00H 00H m1 m2	54
6.1.5. Turn printer state reply on/off (Remote Mode) "ST" 02H 00H 00H m1	55
6.1.6. Job name set "JH" nL nH 00H m1 m2 m3 m4 m5 <job name>	56
6.1.7. Start job "JS" nn 00H 00H <job name> m1	57
6.1.8. End job "JE" 01H 00H 00H.....	57
6.1.9. Select paper media "MI" 04H 00H 00H m1 m2 m3	58
6.1.10. User Setting "US" 03H 00H 00H m1 m2	61
6.1.11. Set mechanism sequence "SN" 01H 00H 00H.....	62
6.1.12. Select paper path "PP" 03H 00H 00H m1 m2.....	63
6.1.13. Terminate Remote Mode (Remote Mode) ESC 00H 00H 00H.....	64
6.1.14. Save Setting "SV" 00H 00H.....	65
CHAPTER 7 : STATUS REPLY CODE SPECIFICATION	66
7.1. Status code.....	67

7.2. Error code	68
7.3. Warning code	69
7.4. Paper path	70
7.5. Cleaning time information	70
7.6. Replace cartridge information	70
7.7. Ink information	71
7.8. Loading path information	71
7.9. Cancel code	72
7.10. Job name Information	72
CHAPTER 8 : DEVICE ID	73

Tables

Table 1	The EPSON EP-4004/Artisan 1430/Stylus Photo 1430W/1500W Printers Feature Summary	5
Table 2	Coordinate Systems for a Single Sheet of Paper.....	12
Table 3	Printable Area Dimensions (Zero margin/ Borderless).....	15
Table 4	Printable Area Dimensions (CD-R)	17
Table 5	Command Sequence for the Conventional command method of graphics data transmission.....	23
Table 6	Command Sequence for the newer Method of ESC (D command method of graphics data transmission	24

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CHAPTER 1 : Introduction

This section of this handbook will provide a technical overview of EPSON EP-4004/Artisan 1430/Stylus Photo 1430W/ 1500W to facilitate driver development.

1.1. Features

The EPSON EP-4004/Artisan 1430/Stylus Photo 1430W/1500W is a wide carriage of the eight color inkjet printer introduced by EPSON. This printer's advanced EPSON Micro Piezo technology produces smaller ink droplets. The EPSON EP-4004/Artisan 1430/Stylus Photo 1430W/1500W is an ideal printer. It will deliver resumes, letterheads, reports, envelopes and presentations on all types of paper or transparent media. It is PC and Macintosh compatible and offers the advantages of USB connectivity.

In Japan, this printer is sold as "EPSON EP-4004".

In U.S.A., Canada, and Asia, this printer is sold as "Artisan 1430".

In Latin, Brazil, and Mexico, this printer is sold as "EPSON Stylus Photo 1430W".

In Europe, this printer is sold as "EPSON Stylus Photo 1500W".

The EPSON EP-4004/Artisan 1430/Stylus Photo 1430W/1500W uses the original Black, Cyan, Magenta, Yellow, Light-Cyan, and Light-Magenta separate ink cartridges.

The EPSONEP-4004/Artisan 1430/Stylus Photo 1430W/1500W printer incorporates the following features:

- Largest resolution in 5760x1440dpi
- CD-R and DVD-R tray printing
- Individual Ink Cartridge
- Zero margin / Borderless printing for Faster Speed
- I/F : USB2.0 Hi Speed, IEEE802.11b/g/n (Wireless)

With the EP-4004/Artisan 1430/Stylus Photo 1430W/1500W's bi-directional interfaces and EPSON's Remote Mode bi-directional printer control language, the host computer can obtain useful printer status information.

See CHAPTER 6 in this Handbook for further information concerning EPSON's Remote Mode printer control language.

Table 1 The EPSON EP-4004/Artisan 1430/Stylus Photo 1430W/1500W Printers Feature Summary

	EPSON EP-4004/Artisan 1430/Stylus Photo 1430W/1500W
Print Head	90 nozzles x 6 for KCMYLcLm Original individual ink cartridge.
Interface (s)	USB 2.0
Printer Language	ESC/P Raster & Remote Mode
Resolution Max (dpi)	* 5760(h) x 1440(v)
Font	No support
Support Code table	No support
Ink Cartridge Type	**CMYKLcLm

* - This printing mode is achieved by the printer driver only.

** - CMYK,Lc,Lm refers to: Cyan, Magenta, Yellow, Black, Light Cyan, and Light Magenta.

CHAPTER 2 : PAPER TYPES AND SIZES Media Specification

In addition to the standard plain paper and envelope sizes, EPSON provides special paper types in the following sizes:

2.1. Paper Sizes for the EP-4004/Artisan 1430/Stylus Photo 1430W/1500W

Y: quality guarantee, △: guarantee with conditions

Paper Type	Size	Standard				Borderless			
		U.S.A.	Euro	Asia/Pac	Japan	U.S.A.	Euro	Asia/Pac	Japan
普通紙 Plain Paper	A3	Y	Y	Y	Y	-	-	-	△
	US B	Y	-	-	-	-	-	-	-
	B4	Y	Y	Y	Y	-	-	-	-
	Legal	Y	Y	Y	Y	-	-	-	-
	Letter	Y	Y	Y	Y	-	-	-	-
	A4	Y	Y	Y	Y	-	-	-	△
	B5	-	Y	Y	Y	-	-	-	-
	A5	-	Y	Y	Y	-	-	-	-
	Half Letter	Y	-	-	-	-	-	-	-
	A6	Y	Y	Y	Y	-	-	-	-
	User Defined	Y	Y	Y	Y	-	-	-	△
両面上質普通紙<再生紙> Bright White Inkjet Paper	A3	-	-	-	Y	-	-	-	△
	A4	-	Y	Y	Y	-	-	-	△
写真用紙クリスピー<高光沢> (国内のみ対応) Ultra Premium Photo Paper Glossy (U.S.A.) Ultra Glossy Photo Paper (Other)	A3+ / Super A3	-	-	-	Y	-	-	-	Y
	A3	-	-	-	Y	-	-	-	Y
	四切	-	-	-	Y	-	-	-	Y
	Letter	Y	-	-	-	Y	-	-	-
	A4	-	Y	Y	Y	-	Y	Y	Y
	8x10	-	-	-	Y	-	-	-	Y
	2L 5x7 (13x18)	-	Y	-	Y	-	Y	-	Y
	KG 4x6 (10x15)	Y	Y	-	Y	Y	Y	-	Y
L (3R)	-	-	-	Y	-	-	-	Y	
写真用紙<光沢> Premium Photo Paper Glossy(U.S.A.) Premium Glossy Photo Paper(Other)	A3+ / Super A3	Y	Y	Y	Y	Y	Y	Y	Y
	US B	Y	-	-	-	-	-	-	-
	A3	Y	Y	Y	Y	Y	Y	Y	Y
	11x14	Y	-	-	-	Y	-	-	-
	四切	-	-	-	Y	-	-	-	Y
	Letter	Y	-	-	-	Y	-	-	-
	A4	-	Y	Y	Y	-	Y	Y	Y
	8x10	Y	-	-	Y	Y	-	-	Y
	2L 5x7 (13x18)	Y	Y	Y	Y	Y	Y	Y	Y
	ハイビジョンサイズ HV wide size 102x181mm	-	Y	-	Y	-	Y	-	Y
	4x6 / KG (102x152mm)	Y	Y	Y	Y	Y	Y	Y	Y
	L (3R)	-	-	-	Y	-	-	-	Y
	カードサイズ Card (54x86mm)	-	-	-	Y	-	-	-	Y
写真用紙エントリー<光沢> Photo Paper Glossy (U.S.A.) Glossy Photo Paper (Other)	A3+ / Super A3	Y	Y	Y	Y	Y	Y	Y	Y
	A3	-	Y	Y	Y	-	Y	Y	Y
	US B (11x17)	Y	-	-	-	Y	-	-	-
	Letter	Y	-	-	-	Y	-	-	-
	A4	Y	Y	Y	Y	Y	Y	Y	Y
2L 5x7 (13x18)	-	Y	-	Y	-	Y	-	Y	

Paper Type	Size	Standard				Borderless			
		U.S.A.	Euro	Asia/Pac	Japan	U.S.A.	Euro	Asia/Pac	Japan
	KG 4x6 (10x15)	Y	Y	Y	Y	Y	Y	Y	Y
	L	-	-	-	Y	-	-	-	Y
写真用紙<絹目調> Premium Photo Paper Semi-Gloss(U.S.A.) Premium Semigloss Photo Paper(Other)	A3+ / Super A3	Y	Y	Y	Y	Y	Y	Y	Y
	A3	Y	Y	Y	Y	Y	Y	Y	Y
	Letter	Y	-	-	-	Y	-	-	-
	A4	-	Y	Y	Y	-	Y	Y	Y
	2L 5x7 (13x18)	-	-	-	Y	-	-	-	Y
	KG 4x6 (10x15)	Y	Y	Y	-	Y	Y	Y	-
	L	-	-	-	Y	-	-	-	Y
	ハガキ Postcard	-	-	-	Y	-	-	-	Y
フォトマット紙 Premium Presentation Paper Matte(U.S.A.) Matte Paper Heavy-weight(Other)	A3+ / Super A3	Y	Y	Y	Y	Y	Y	Y	Y
	A3	Y	Y	Y	Y	Y	Y	Y	Y
	11x14	Y	-	-	-	Y	-	-	-
	Letter	Y	-	-	-	Y	-	-	-
	A4	-	Y	Y	Y	-	Y	Y	Y
	8x10	Y	-	-	-	Y	-	-	-
フォトマット紙/顔料専用 (Japan) Ultra Premium Presentation Matte (U.S.A.) Archival Matte Paper (Other)	A3+ / Super A3	Y	Y	-	-	Y	Y	-	-
	A3	Y	Y	-	-	Y	Y	-	-
	Letter	Y	-	-	-	Y	-	-	-
	A4	-	Y	-	-	-	Y	-	-
Premium Presentation Paper Matte Double-sided (U.S.A.) Double-sided Matte Paper (Other)	Letter	Y	-	-	-	-	-	-	-
	A4	-	Y	Y	-	-	-	-	-
スーパーファイン紙 Presentation Paper Matte(U.S.A.) Photo Quality Ink-Jet Paper (Other)	A3+ / Super A3 / B	Y	Y	Y	Y	-	-	-	△
	A3	Y	Y	Y	Y	-	-	-	△
	US B 11x17	Y	-	-	-	-	-	-	-
	Letter	Y	-	-	-	-	-	-	-
	A4	Y	Y	Y	Y	-	-	-	△
往復ハガキ Reply-paid postcard	往復ハガキ Reply-paid postcard	-	-	-	Y	-	-	-	-
ハガキ Postcard	ハガキ Postcard	-	-	-	Y	-	-	-	Y
IJハガキ Inkjet Postcard	ハガキ Postcard	-	-	-	Y	-	-	-	Y
郵政光沢ハガキ Glossy Postcard	ハガキ Postcard	-	-	-	-	-	-	-	Y
国内封筒 Envelope	長形 3号	-	-	-	Y	-	-	-	-
	長形 4号	-	-	-	Y	-	-	-	-
	洋形 1号	-	-	-	Y	-	-	-	-
	洋形 2号	-	-	-	Y	-	-	-	-
	洋形 3号	-	-	-	Y	-	-	-	-
	洋形 4号	-	-	-	Y	-	-	-	-
	#10	Y	Y	Y	-	-	-	-	-
	DL	-	Y	Y	-	-	-	-	-
	C6, 洋形 2号	-	Y	Y	-	-	-	-	-
アイロンプリントペーパー Iron-On Cool Peel transfer Paper	A3	-	Y	-	Y	-	-	-	-
	A4	-	Y	Y	Y	-	-	-	-
Iron-On Cool Peel Transfer	Letter	Y	-	-	-	-	-	-	-
スーパーファイン専用ラベルシート Photo Quality Self Adhesive Sheet	A4	-	-	-	Y	-	-	-	△
ミニフォトシール	A6	-	-	Y	-	-	-	-	-

Paper Type	Size	Standard				Borderless			
		U.S.A.	Euro	Asia/Pac	Japan	U.S.A.	Euro	Asia/Pac	Japan
	ハガキ Postcard	-	-	-	Y	-	-	-	-
フォトシール フリーカット	ハガキ Postcard	-	-	-	Y	-	-	-	-
CD/DVD レーベル CD/DVD	φ 12cm	Y	Y	-	Y	-	-	-	-
	φ 8cm	Y	Y	-	Y	-	-	-	-
高画質 CD/DVD CD/DVD Premium Surface	φ 12cm	Y	Y	-	Y	-	-	-	-
	φ 8cm	Y	Y	-	Y	-	-	-	-

* No support for CD/DVD glossy surface media.

* A CD media's Minimum inner diameters is 18mm. (standards:43mm)

* The user definition sizes other than a general plain paper are assumed to be non support (form not guaranteed). : *Postcards support(Japan) : Glossy(Oji Paper, Daio Paper, and Japan paper manufacture) / IJ / Plain paper manufacture)

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2.2. Paper Size and Orientation

Paper Type	Dimensions W x L	Support				Orientation	
		U.S.A.	Euro	Asia/ Pac	Japan		
A3+ / US SuperB	329mm x 483mm	O	O	O	O	Yes	No
A3	297mm x 420mm	O	O	O	O	Yes	No
A2	420mm x 594mm	X	X	X	X	Yes	No
US B (Ledger)	279mm x 432mm	O	X	X	X	Yes	No
US C	17in x 22in	X	X	X	X	Yes	No
B3	364mm x 515mm	X	X	X	X	Yes	No
B4	257 mm x 364 mm	O	O	O	O	Yes	No
Legal	8.5in. x 14in.	O	O	O	O	Yes	No
Letter	8.5in. x 11in.	O	O	O	O	Yes	No
11x14in	11in x 14 in.	O	X	X	X	Yes	No
8x10in	8in x 10 in.	O	X	X	O	Yes	No
Executive	7.25 in. x 10.5 in.	X	X	X	X	Yes	No
Half Letter	5.5 in. x 8.5 in.	X	X	X	X	Yes	No
A4	210 mm x 297 mm	O	O	O	O	Yes	No
A5	148 mm x 210 mm	X	O	O	O	Yes	No
A6 Index Card / A6	105 mm x 148 mm	O	O	O	O	Yes	No
B5	182 mm x 257 mm	X	O	O	O	Yes	No
Index card 5in. x8in.	5 in. x 8 in.	X	X	X	X	Yes	No
Index card 8in. x10in.	8 in. x 10 in.	X	X	X	X	Yes	No
2 L判 / 5inx7in.	127x178 mm	O	O	O	O	Yes	No
4x6in	102 x 152 mm	O	O	O	O	Yes	No
ハイビジョンサイズ 16:9wide	102 x 181mm	X	O	X	O	Yes	No
四切	254 x 305mm	X	X	X	O	Yes	No
Photo Paper 4 x 6 in./フォトカード	113.6 mm x 164.4 mm*1)	X	X	X	X	Yes	No
Photo Paper 4x6in No Perforations	101.6 x 152.4mm	X	X	X	X	Yes	No
L判 / 3.5inx5in.	89 x 127 mm	X	X	X	O	Yes	No
カードサイズ	86x55mm	X	X	X	X	Yes	No
100x150mm	100 mm x 150 mm	X	X	X	X	Yes	No
Photo Paper 200x300mm	216 mm x 338 mm *2)	X	X	X	X	Yes	No
Panoramic Photo Paper	210 mm x 594 mm	X	X	X	X	Yes	No
ハガキ	100 mmx148 mm	X	X	X	O	Yes	No
往復ハガキ	200 mmx148 mm	X	X	X	O	Yes	No
Envelope #10	9.5 in. x 4 .125 in.	O	O	O	X	Yes	No
Envelope DL	220 mm x 110 mm	X	O	O	X	Yes	No
Envelope C6	162 mm x 114 mm	X	O	O	X	Yes	No
Envelope 132 x 220	220 mm x 132 mm	X	X	X	X	Yes	No
長形 3号封筒	120mm x 235mm *3)	X	X	X	O	Yes *4)	No
長形 4号封筒	90mm x 205mm *3)	X	X	X	O	Yes *4)	No
洋形 1号封筒	120mm x 176mm	X	X	X	O	Yes	No
洋形 2号封筒	114mm x 162mm	X	X	X	O	Yes	No
洋形 3号封筒	98mm x 148mm	X	X	X	O	Yes	No
洋形 4号封筒	105mm x 235mm	X	X	X	O	Yes	No
CD/DVD(12cm)	Φ 12cm	O	O	X	O	Yes	No
CD/DVD(8cm)	Φ 8cm	O	O	X	O	Yes	No

User-defined / ユーザ定義 (Borden)	89 to 241.3 mm x 89 to 1117.6 mm(3.5 in. to 9.5 in. x 3.5 in. to 44 in.)	O	O	O	O	Yes	No
----------------------------------	--------------------------------------------------------------------------------	---	---	---	---	-----	----

Each of the predetermined sizes is inserted only in the orientation indicated by "Yes" in the above table.

Printing at a rotation of 90° for each of the predetermined sizes must be carried out by the application.

*1):Photo Paper 4in.x6in. :113.6 mm x 164.4 mm is logical size on printer driver, Real paper-size is 113.6 mm x 175.4 mm.

*2):Photo Paper 200 x 300 mm: Top margin non-printable area and Bottom margin non-printable area both length are 14mm.

*3):Dimension indicates body size without flap.

*4):Loading envelope, flap edge first, with printable side up.

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2.3. Printable Area

For the purpose of printing, a sheet of paper is divided into two regions: the printable area and the non-printable area. These areas are defined as follows.

The printable area is the region within which the printing position can be set, and is the portion which is surrounded by the left margin position, the right margin position, the top margin position, and the bottom margin position.

The non-printable area is the region in which the printing position cannot be set, except for the right margin position, and is the region on the paper outside the printable area.

The margins, which determine the printable area, are defined as follows.

The left margin determines the non-printable strip appended to the left side of the printable area. The left margin position, which defines the margin boundary, is set upon the X axis. Moreover, the left margin position is considered as being included in the printable area.

The right margin determines the non-printable strip appended to the right side of the printable area. The right margin position, which defines the margin boundary, is set upon the X axis. Moreover, the right margin position is considered as being included in the non-printable area. However, it is possible to set the printing position to the right margin position.

The top margin determines the non-printable strip appended to the upper side of the printable area. The top margin position, which defines the margin boundary, is set upon the Y axis. Moreover, the top margin position is considered as being included in the printable area.

The bottom margin determines the non-printable strip appended to the lower side of the printable area. The bottom margin position, which defines the margin boundary, is set upon the Y axis. Moreover, the bottom margin position is considered as being included in the printable area.

The page management X-Y discrete coordinate system (hereinafter abbreviated as the page management coordinate system) which is used as the reference for setting the position of each of these margins, is the same as the position management coordinate system, except for the definition of the origin.

The position management coordinate system is the coordinate system for management of the printable area which is set within the page management coordinate system.

The position management coordinate system is set for each page separately.

The origin of the page management coordinate system is defined as follows.

The origin upon the X axis is set to the minimum printing position. The minimum printing position is the farthest leftward printing position that can physically be set upon the paper. The minimum printing position depends upon the horizontal position of the paper when it is inserted.

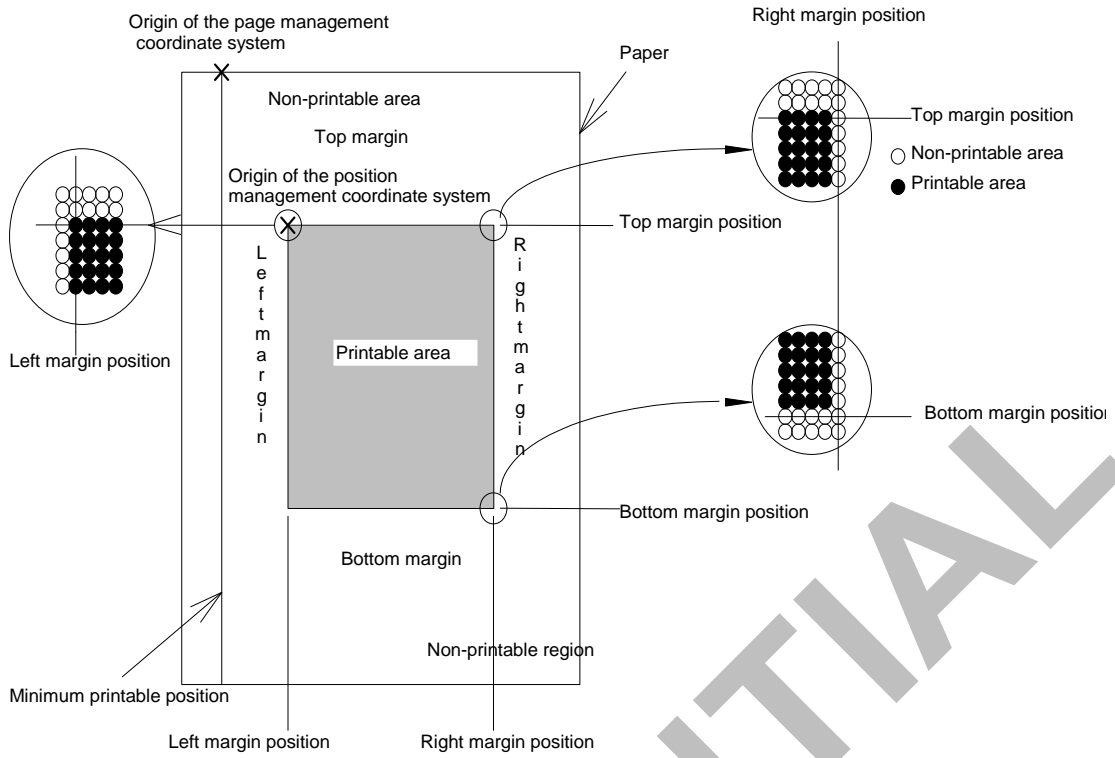
As for the origin upon the Y axis, for the first page directly after paper insertion, the upper edge of the paper is defined as the origin. For the second and subsequent pages, a position advanced by the page length from the origin on the page management coordinate system for the previous page is defined as the origin for the current page. Since in the case of single sheet paper only one page at a time can be inserted, the upper edge of the paper is always taken as the origin.

Here, page and page length are defined as follows.

A page means a unit region in the Y direction which includes within it a single printable area if the paper which is inserted is single sheet paper, only one page can be established upon each sheet. If the paper which is inserted is continuous paper, a plurality of pages can be established upon it.

The page length is the length in the Y direction of the page. If the paper which is inserted is single sheet paper, the length of the printing region in the Y direction from the top margin position to just before the bottom margin position is taken as the page length. If the paper which is inserted is continuous paper, the distance from the top margin position on the present page to the top margin position upon the next page is taken as the page length.

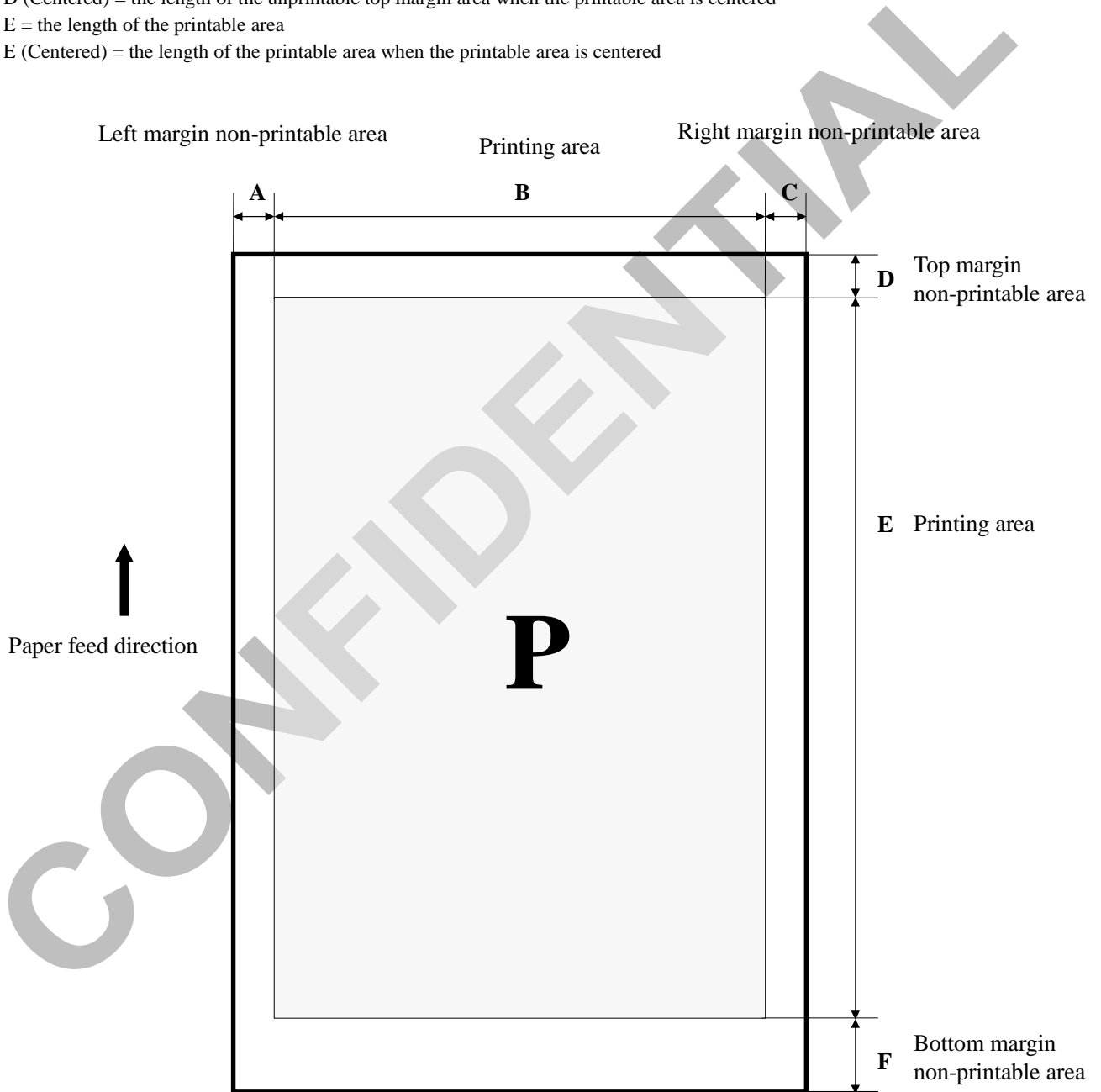
Table 2 Coordinate Systems for a Single Sheet of Paper



2.3.1. Printing Area (Standard)

The printable areas of various paper sizes on the EPSON EP-4004/Artisan 1430/Stylus Photo 1430W/1500W printer is defined hereafter. Values are expressed in dot units, where 1 dot = 1/360 inch. As is displayed in the following diagram, printable area can be defined as follows:

- A = the width of the unprintable left margin area
- A (Centered) = the width of the unprintable left margin area when the printable area is centered
- B = the width of the printable area
- B (Centered) = the width of the printable area when the printable area is centered
- C = the width of the unprintable right margin area
- C (Centered) = the width of the unprintable right margin area when the printable area is centered
- D = the length of the unprintable top margin area
- D (Centered) = the length of the unprintable top margin area when the printable area is centered
- E = the length of the printable area
- E (Centered) = the length of the printable area when the printable area is centered



Standard Sizes

The printing area is specified by A, B, D, and E.

	A/A(Centered)	B/B(Centered)	D/D(Centered)	E/E(Centered)
Legal	42/42	2976/2976	42/42	4800/4956
Letter	42/42	2976/2976	42/42	3720/3876
A4	42/42	2892/2892	42/42	3969/4125
A5	42/42	2014/2014	42/42	2736/2892
A6	42/42	1404/1404	42/42	1858/2014
A3	42/42	4125/4125	42/42	5628/5869
A3+	42/42	4579/4579	42/42	6521/6762
B5	42/42	2496/2496	42/42	3403/3559
B4	42/42	3558/3558	42/42	4876/5046
2L Size/ 5inx7in.	42/42	1716/1716	42/42	2280/2436
Photo Paper 4x6 in.	42/42	1526/1526	42/42/(NA)	2246/(NA)
L Size/ 3.5inx5in.	42/42	1176/1176	42/42	1560/1716
8x10in	42/42	2796/2796	42/42	3318/3516
Yotsugiri/ 10x17in	42/42	3516/3516	42/42	5838/6036
12x12in	42/42	4233/4236	42/42	3995/4236
11x14in	42/42	3876/3876	42/42	4715/4956
US B	42/42	3876/3876	42/42	5795/6036
Hi-Vision (4x7.11in)	42/42	1356/1356	42/42	2235/2476
Japanese Postcard	42/42	1333/1333	42/42	1858/2014
Japanese Double Postcard	42/42	2751/2751	42/42	1858/2014
Card	42/42	680/680	42/42	937/1135
#10 Envelope	42/(N/A)	2976/(N/A)	42/42	1245/1401
DL Envelope	42/(N/A)	2976/(N/A)	42/42	1319/1475
C6 Envelope	42/42	2212/2212	42/42	1376/1532
Envelope 132 x 220	42/42	2976/(NA)	42/42	1631/1787
Japanese YOKEI 1	42/42	1617/1617	42/42	2254/2410
Japanese YOKEI 2	42/42	1532/1532	42/42	2056/2212
Japanese YOKEI 3	42/42	1305/1305	42/42	1858/2014
Japanese YOKEI 4	42/42	1404/1404	42/42	3091/3247
Japanese CHOKEI 3	42/42	1617/1617	396/396	3091/3247
Japanese CHOKEI 4	42/42	1192/1192	297/297	2666/2822

User-defined

With a paper type set by the user, a printing area defined by A, B, D, and E of at least the following number of dots is reserved.

	A/A(Centered)	B/B(Centered)	D/D(Centered)	E/E(Centered)
User-defined	42/42	max. 2976 / max. 2976	42/42	max. 15600 / max. 15756

2.3.2. Printing Area (Zero margin / Borderless)

The printable areas of various paper sizes on the EP-4004/Artisan 1430/Stylus Photo 1430W/1500W printer is defined hereafter. Values are expressed in dot units, where 1 dot = 1/360 inch. As is displayed in the following diagram, printable area can be defined as follows:

- A = the width of the left override area
- B' = the width of the printable area
- C = the width of the right override area
- D = the length of the top override area
- E' = the length of the printable area
- F = the length of the bottom override area
- I = the length of the top override area (unprintable area)

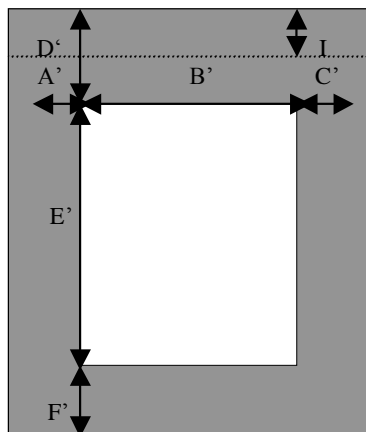


Table 3 Printable Area Dimensions (Zero margin/ Borderless)

The printing area is specified by A, B, D, and E.

Paper	Size	U.S.A.	Euro/Asia	Japan	A'	B'	C'	D'	E'	F'	I
Cut Paper	A3	O	O	O	0	4209	0	0	5953	0	0
	A3+	O	O	O	0	4663	0	0	6846	0	0
	A4	O	O	O	0	2976	0	0	4209	0	0
	Letter	O	X	X	0	3060	0	0	3960	0	0
	Yotsugiri / 10x17in	X	X	O	0	3600	0	0	4324	0	0
	2L Size / 5x7in.	O	O	O	0	1800	0	0	2522	0	0
	4x6in	O	O	O	0	1440	0	0	2160	0	0
	L Size/3.5x5in.	X	X	O	0	1261	0	0	1800	0	0
	Japanese Postcard	X	X	O	0	1417	0	0	2098	0	0
	8x10in.	X	X	O	0	2880	0	0	3600	0	0
	11x14in	O	X	X	0	3960	0	0	5040	0	0
	US B	O	X	X	0	3960	0	0	6120	0	0
	Credit card size	X	X	O	0	782	0	0	1289	0	0
Hi-Vision	O	O	O	0	1440	0	0	2560	0	0	

- 1) Only Photo Paper, Matte Paper – Heavyweight, Card are able to margin less printing.

2.4. Enable paper size of zero margin printing

Paper Type	Dimensions W x L	U.S.A.	Euro/Asia	Japan
A3+ / Super A3 / B	329mm x 483mm	O	O	O
A3	297mm x 420mm	O	O	O
11x14in	11in x 14 in.	O	X	X
Letter	8.5in. x 11in.	O	X	X
A4	210 mm x 297 mm	O	O	O
Yotsugiri / 10x17in	254 mm x 305 mm	X	X	O
US B	11in x 17in	O	X	X
8x10in	8in x 10 in.	X	X	O
2L size / 5inx7in.	127x178 mm	O	O	O
4x6in	101.6 x 152.4mm	O	O	O
L size / 3.5inx5in.	89 x 127 mm	X	X	O
Japanese Postcard	100 mmx148 mm	X	X	O
Hi-Vision	89mm x 158 mm	O	O	O
Credit card size	86mmx55mm	X	X	O

CONFIDENTIAL

2.5. Printing Area (CD-R)

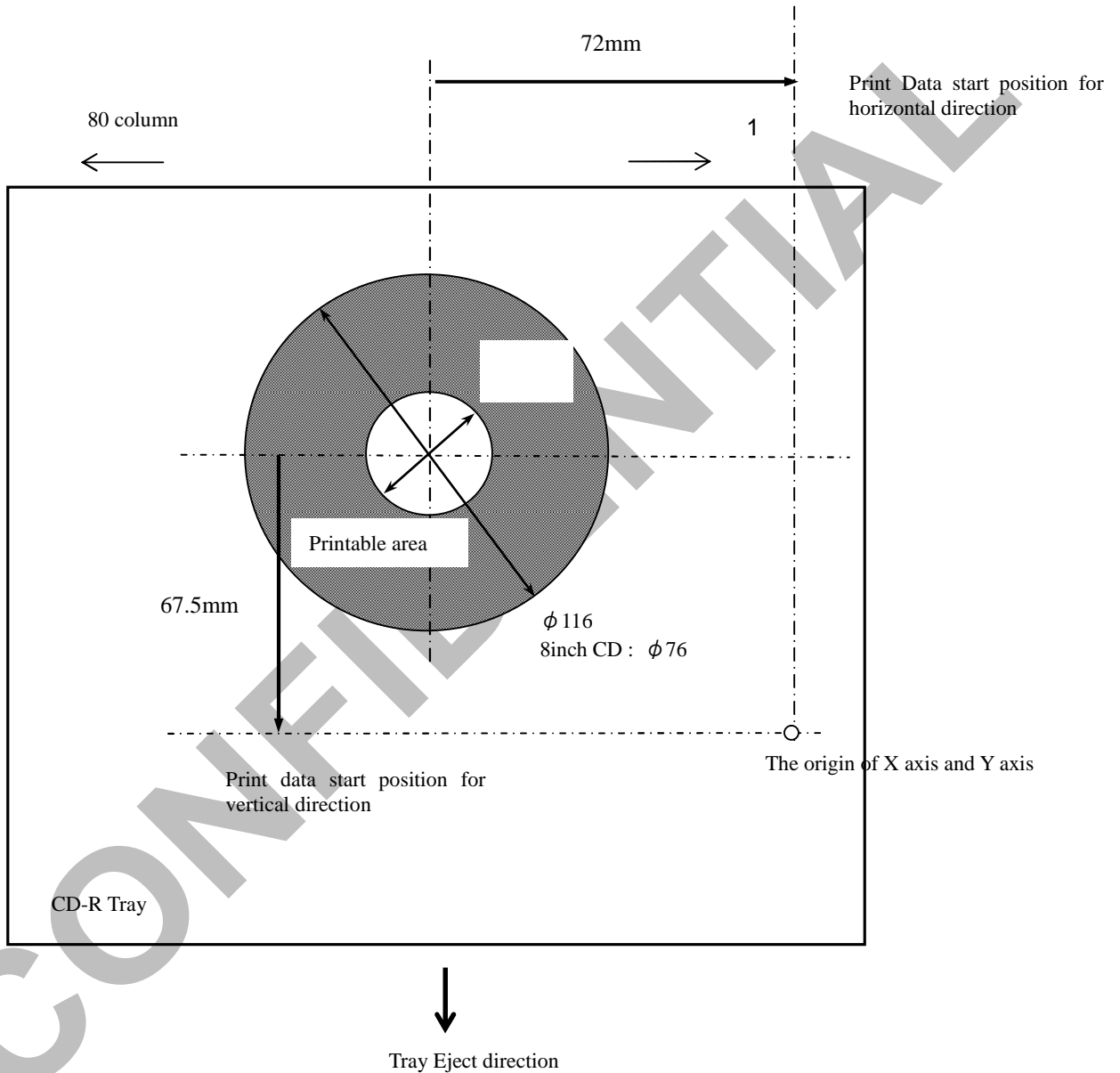
The printable area of CD-R is as below.

The inside of $\Phi 116$ and the outside of $\Phi 21$ is printable area.

The method of setting the printable area is as follows.

- (1) The standard of horizontal direction is the 72mm position far from the center of CD-R. (Center of CD-R is found automatically.)
- (2) The standard of vertical direction is the 67.5mm position far from the center of CD-R.

Table 4 Printable Area Dimensions (CD-R)



CHAPTER 3 : Printing Option

3.1. Printing Quality

The EPSON EP-4004/Artisan 1430/Stylus Photo 1430W/1500W has the capability of printing at eleven different levels of quality.

Print density			Dot size	Raster command density	ESC (D setting horizontal	ESC (D setting vertical	ESC i setting	ESC (e setting
Plain paper	Special Paper	(Horizontal x Vertical)		(H x V)	h / r	v / r	mH*256+mL	n2
Draft	-	360dpi x 180dpi	ECO	360dpi x 90dpi 2bit	4/1440	16/1440	Max 90	10H
Normal	-	720dpi x 360dpi	MC1-1	360dpi x 90dpi 2bit	2/1440	16/1440	Max 90	21H
-	Draft	720dpi x 360dpi	MC1-1	720dpi x 90dpi 2bit	2/1440	16/1440	Max 90	21H
Photo	-	720dpi x 720dpi	MC2-4	360dpi x 90dpi 2bit	4/1440	16/1440	Max 90	34H
	Default	720dpi x 720dpi	MC2-3	360dpi x 90dpi 2bit	4/1440	16/1440	Max 90	33H
	Default	720dpi x 720dpi	MC2-4	360dpi x 90dpi 2bit	4/1440	16/1440	Max 90	34H
-	Super Photo	5760dpi x 1440dpi	MC1-5	720dpi x 90dpi 2bit	2/1440	16/1440	Max 90	25H

3.2. Recommended Settings for Color and Monochrome Printing

Monochrome or Color printing mode depends on the ESC (K command). See the individual command specifications.

3.2.1. Recommended Setting Modes (Color&Black) for Japan

Media	Preset name	Print Quality	Resolution [dpi]
普通紙	ドラフト	Economy	360 x 180
	& 標準	Normal	720 x 360
	きれい	Fine	720 x 720
EPSON 写真用紙	& 標準	Photo	720 x 720
	きれい	Super Photo	5760 x 1440
EPSON 写真用紙クリスピーア	& 標準	Photo	720 x 720
	きれい	Super Photo	5760 x 1440
EPSON 写真用紙エントリー	& 標準	Photo	720 x 720
	きれい	Super Photo	5760 x 1440
EPSON 写真用紙<絹目調>	& 標準	Photo	720 x 720
	きれい	Super Photo	5760 x 1440
EPSON フォトマット紙	標準	Photo	720 x 720
EPSON スーパーファイン紙	標準	Photo	720 x 720
EPSON スーパーファイン専用ラベルシート	標準	Photo	720 x 720
EPSON スーパーファイン専用ハガキ	標準	Photo	720 x 720
郵便光沢ハガキ	& 標準	Photo	720 x 720
	きれい	Super Photo	5760 x 1440
郵便ハガキ (インクジェット紙)	標準	Photo	720 x 720
郵便ハガキ	& 標準	Normal	360 x 360
	きれい	Fine	720 x 720
CD/DVD レーベル	きれい	Super Photo	5760 x 1440
高画質対応 CD/DVD レーベル	きれい	Super Photo	5760 x 1440
EPSON フォトシール	きれい	Super Photo	5760 x 1440
アイロンプリントペーパー	標準	Photo	720 x 720
封筒	& 標準	Normal	720 x 360
	きれい	Fine	720 x 720

& : default

3.2.2. Recommended Setting Mode for Driver (Color & Black) <Windows/Over sea>

Media	Preset name	Print Quality	Resolution [dpi]
Plain Paper	Default	Economy	360 x 180
	Text	Normal	720 x 360
	Photo Fine	Fine	720 x 720
Ultra Premium Photo paper Glossy Ultra Glossy Photo Paper	Draft	Photo	720 x 720
	Text	Photo	720 x 720
	Text & Image	Photo	720 x 720
	Photo	Photo	720 x 720
	Best Photo	Photo RPM	5760 x 1440
Premium Photo Paper Glossy Premium Glossy Photo Paper	Text	Photo	720 x 720
	Text & Image	Photo	720 x 720
	Photo	Photo	720 x 720
	Best Photo	Photo RPM	5760 x 1440
Premium Photo Paper Semi-Gloss Premium Semigloss Photo Paper	Text	Photo	720 x 720
	Text & Image	Photo	720 x 720
	Photo	Photo	720 x 720
	Best Photo	Photo RPM	5760 x 1440
Ultra Premium Photo Paper Luster	Text	Photo	720 x 720
	Text & Image	Photo	720 x 720
	Photo	Photo	720 x 720
	Best Photo	Photo RPM	5760 x 1440
Photo Paper Glossy Glossy Photo Paper	Text	Photo	720 x 720
	Text & Image	Photo	720 x 720
	Photo	Photo	720 x 720
	Best Photo	Photo RPM	5760 x 1440
Premium Presentation Paper Matte Matte Paper –Heavyweight Premium Presentation Paper Matte Double-sided	Draft	Photo	720 x 720
	Text	Photo	720 x 720
	Text & Image	Photo	720 x 720
	Photo	Photo	720 x 720
	Best Photo	Photo RPM	5760 x 1440
Ultra Premium Presentation Paper Matte Archival Matte Paper Enhanced Matte Paper	Photo	Photo	720 x 720
	Best Photo	Photo RPM	5760 x 1440
Presentation Paper Matte Photo Quality Ink Jet Paper	Draft	Photo	720 x 720
	Text	Photo	720 x 720
	Text & Image	Photo	720 x 720
	Photo	Photo	720 x 720
	Best Photo	Photo RPM	5760 x 1440
CD/DVD CD/DVD premium Surface	Draft	Photo	5760 x 1440
	Text	Photo	5760 x 1440
	Text & Image	Photo	5760 x 1440
	Photo	Photo	5760 x 1440
	Best Photo	Photo	5760 x 1440
Photo Stickers 16	Best Photo	Fine	5760 x 1440
Envelope	Draft	Normal	720 x 360
	Text	Normal	720 x 360
	Text & Image	Fine	720 x 720
	Photo	Fine	720 x 720
	Best Photo	Fine	720 x 720

 : default

3.2.3. Recommended Setting Modes (Color & Black) <Macintosh/Over sea>

Media	Preset name	Print Quality	Resolution [dpi]
Plain Paper	Speed	Normal	720 x 360
	Quality	Fine	720 x 720
Ultra Premium Photo paper Glossy Ultra Glossy Photo Paper	Speed	Photo	720 x 720
	Quality	Photo RPM	5760 x 1440
Premium Photo Paper Glossy Premium Glossy Photo Paper	Speed	Photo	720 x 720
	Quality	Photo RPM	5760 x 1440
Premium Photo Paper Semi-Gloss Premium Semigloss Photo Paper	Speed	Photo	720 x 720
	Quality	Photo RPM	5760 x 1440
Ultra Premium Photo Paper Luster	Speed	Photo	720 x 720
	Quality	Photo RPM	5760 x 1440
Photo Paper Glossy Glossy Photo Paper	Speed	Photo	720 x 720
	Quality	Photo RPM	5760 x 1440
Premium Presentation Paper Matte Matte Paper –Heavyweight Premium Presentation Paper Matte Double-sided	Speed	Photo	720 x 720
	Quality	Photo RPM	5760 x 1440
Ultra Premium Presentation Paper Matte Archival Matte Paper Enhanced Matte Paper	Speed	Photo	720 x 720
	Quality	Photo RPM	5760 x 1440
Presentation Paper Matte Photo Quality Ink Jet Paper	-	Photo	720 x 720
CD/DVD CD/DVD premium Surface	-	Photo	5760 x 1440
Photo Stickers 16	-	Fine	5760 x 1440
Envelope	Speed	Photo	720 x 360
	Quality	Photo RPM	720 x 720

 : default

4.1. Raster Graphics Modes

The following three modes are available for raster graphics commands:

- 1) Non-compressed mode - the print data is transferred without being compressed.
Effective for printing data with a low compression ratio, such as photographs.
- 2) Run-length encoded mode - the print data is transmitted after run-length encoding compression.
Effective for printing data such as graphs and figures, in which patterns appear repeatedly.
- 3) TIFF compressed mode - the print data is transferred after TIFF compression.
Effective for printing data such as graphs and figures, in which patterns appear repeatedly.

CONFIDENTIAL

4.2. Command Transfer Procedure

4.2.1. Command transfer sequence for non-compressed and the run-length encoded compression modes

The following are the basic commands used in non-compressed and run-length encoded modes. The commands are listed in the order as they are sent:

Table 5 Command Sequence for the Conventional command method of graphics data transmission

Transfer cycle	Details of setting	Items set	Commands used
By document	1. Initialize settings	1.1 Exit Packet Mode	ESC SOH @EJL...
		Enter remote mode	ESC (R
		Set Printer Timer	TI ***
		Job Start	JS ***
		Set Job Name	JH
		Paper Feed Setup	SN
		Set paper path	PP ****
Set Media information	MI		
Set double paper print	DP		
Set user setting	US		
	Other Remote Commands (optional)		
	Exit Remote Mode	ESC 00H 00H 00H	
	1.2 Initialize printer	ESC @	
	1.3 Select graphics mode	ESC (G	
	1.4 Set unit	ESC (U	
	2. Printing method control	2.1 Turn unidirectional mode on/off	ESC U
		2.2 Select Micro Weave printing mode	ESC (i
		2.3 Select Monochrome or Color	ESC (K
		2.4 Select Ink Drop Size	ESC (e
	3. Set print format (single sheet)	3.1 Set page format	ESC (c or ESC (C
		3.2 Set paper dimension	ESC (S
		3.3 Set print method	ESC (M
By page	By raster	4. Set vertical position	ESC (V or ESC (v
		5. Transfer data	5.1 Select color
		5.2 Set horizontal print position	ESC (/ or ESC (\$
		5.3 Print raster graphics: *	ESC .
		5.4 Print compulsory **	ESC ACK
	6. Form feed	6.1 Form feed	FF
	7. Terminate printing	7.1 Initialize printer	ESC @
		7.2 Enter Remote Mode	ESC (R
		Load NVR Settings	LD
		Job End	JE
		Exit Remote Mode	ESC 00H 00H 00H

* Parameters and data format of non-compressed vs. run-length encoded transmissions will differ with the Print Raster Graphics command.

** In the case of micro weave print mode, ESC ACK command is inserted only when the plural passes are specified with no paper feed.

*** It is necessary to send the TI command before the JS command.

**** Limit at the time of SN command ver.4 or ver.5 sending.

Table 6 Command Sequence for the newer Method of ESC (D command method of graphics data transmission

Transfer cycle		Details of setting	Items set	Commands used
By document		1. Initialize settings	1.1 Exit Packet Mode	ESC SOH @EJL...
			Enter remote mode	ESC (R
			Set Printer Timer	TI **
			Job Start	JS **
			Set Job Name	JH
			Paper Feed Setup	SN
			Set paper path	PP ***
			Set Media information	MI
			Set double paper print	DP
			Set user setting	US
			Other Remote Commands (optional)	
			Exit Remote Mode	ESC 00H 00H 00H
			1.2 Initialize printer	ESC @
			1.3 Select graphics mode	ESC (G
			1.4 Set unit	ESC (U
		2. Printing method control	2.1 Turn unidirectional mode on/off	ESC U
			2.2 Select Micro Weave printing mode	ESC (i
			2.3 Select Monochrome or Color	ESC (K
			2.4 Select Ink Drop Size	ESC (e
			2.5 Set resolution of Raster mode	ESC (D
		3. Set print format (single sheet)	3.1 Set page format	ESC (c or ESC (C
			3.2 Set paper dimension	ESC (S
			3.3 Set print method	ESC (S
By page	By raster	4. Set vertical position	4.1 Set vertical print position	ESC (V or ESC (v
		5. Transfer data	5.1 Set horizontal print position	ESC (/ or ESC (\$
5.2 Print raster graphics: repeat above for each color	ESC i			
5.3 Print compulsory **	ESC ACK			
		6. Form feed	6.1 Form feed	FF
		7. Terminate printing	7.1 Initialize printer	ESC @
			7.2 Enter Remote Mode	ESC (R
			Load NVR Settings	LD
			Job End	JE
			Exit Remote Mode	ESC 00H 00H 00H

* In the case of micro weave print mode, ESC ACK command is inserted only when the plural passes are specified with no paper feed.

** It is necessary to send the TI command before the JS command.

*** Limit at the time of SN command ver.4 or ver.5 sending.

4.3. Limitations of Command Settings

- “Exit Packet Mode”, in many circumstances, command MUST be called before any communication or printing can occur on any I/F. This command is described in “Individual Command Specifications”.
- The “Set absolute vertical print position ESC (V)” and “Set relative vertical print position ESC (v)” commands will set the starting print position of the subsequent data to be printed, including whatever white space may exist within that data. To avoid confusion, it is recommended not to embed large null or white space in the data.
- All null raster data should not be sent to the printer.
- For detailed specifications of the commands which are transmitted, refer to “CHAPTER 5: INDIVIDUAL COMMAND SPECIFICATIONS”.

CONFIDENTIAL

CHAPTER 5 : INDIVIDUAL COMMAND SPECIFICATIONS

5.1.1. Exit Packet Mode

00H 00H 00H ESC 01H “@EJL” 20H “1284.4” 0AH “@EJL” 20H 20H 20H 20H 20H 0AH Ver 1.00

[Name]	EPSON packet mode exit command (special command)	[Setting]
[Format]	00H,00H,00H,1BH,01H,40H,45H,4AH,4CH,20H,31H,32H,38H,34H,2EH,34H,0AH, 40H,45H4AH,4CH,20H,20H,20H,20H,20H,0AH	
[Range of Definition]	---	
[Function]	<ol style="list-style-type: none">1) If the system is in packet mode, this command must be sent before any other commands can be successfully transferred over either USB or Parallel Port, including the basic ESC @ printer initialization command.2) Packet communication protocol (EPSON packet mode) is cancelled. The command for entering packet mode, and the commands utilized in packet mode, are EPSON proprietary.	
[Initial State]	<p>The initial state of the printer, unused and unopened, new from the EPSON box, may or may not be in packet mode. However, once the printer has received any print job from any other source (especially a Windows OS printer driver) it will most likely be in packet mode.</p> <p>If the printer is in EPSON packet mode; no typical USB and possibly Parallel Port transmissions can be received or recognized.</p>	
[Related Commands]	---	

5.1.2. Initialize printer ESC @

ESC @

Ver 1.00

[Name]	Initialize printer	[Setting]
[Format]	1BH, 40H	
[Range of Definition]	-	
[Function]	<ol style="list-style-type: none">1) The various settings are returned to their initial values.2) The Y axis origin of the page management coordinate system and the position management coordinate system are set to the current printing position on the Y axis.3) The present printing position on the X axis is set to the origin upon the X axis.4) Text mode printing is selected.	
[Initial State]	-	
[Related Commands]	<p>[Setting] Commands whose settings are affected by this command. The settings for all commands are returned to their initial states.</p> <p>[Setting] Commands that change the effects of this command. None</p> <p>[Operation] Commands whose functionality is affected by this command. None</p> <p>[Operation] Commands that change the effects of this command. None</p>	

CONFIDENTIAL

LF

[Name]	Line feed	[Operation]
[Format]	0AH	
[Range of Definition]	-	
[Function]	<ol style="list-style-type: none"> 1) Advances the current printing position in the positive Y direction by an amount equal to the current line separation amount. Sets the printing position in the X direction to the starting point (the left margin position) on the X axis of the position management coordinate system. 2) If this commands sets the Y direction printing position into the non-printable area, then the page is ejected, the position management coordinate system is set to the next page, and the printing position is set to the origin of the position management coordinate system for the new page. 	
[Initial State]	-	
[Related Commands]	<p>Related Command [Setting]s that apply an effect. None</p> <p>Related Command [Setting]s that receive an effect. None</p> <p>Related Command [Operation]s that apply an effect. None</p> <p>Related Commands [Operation]s that receive an effect. The amount of advancement per line is set by the ESC + command. The non-printable area is set by the ESC (c command). The amount of advancement per line, the non-printable area, and the left margin position are reset to their initial state by the ESC @ and ESC (G commands).</p>	

5.1.4. Form feed FF

FF

Ver 1.00

[Name]	Form feed	[Operation]
[Format]	0CH	
[Range of Definition]	-	
[Function]	<ol style="list-style-type: none">1) The contents of the print buffer are printed, the current page is ejected, the position management coordinate system is set to the next page, and the printing position is set to the origin of the position management coordinate system for the new page.2) This command is ignored if the printer is out of paper.	
[Initial State]	-	
[Related Commands]	<p>[Setting] Commands whose settings are affected by this command. None</p> <p>[Setting] Commands that change the effects of this command. None</p> <p>[Operation] Commands whose functionality is affected by this command. None</p> <p>[Operation] Commands that change the effects of this command. The page length is set by the ESC (C command). The page length and the left margin position are reset to their initial states by the ESC @ and ESC (G commands).</p>	

CONFIDENTIAL

5.1.5. Carriage Return CR

CR

Ver 1.00

[Name]	Carriage Return	[Operation]
[Format]	ODH	
[Range of Definition]	-	
[Function]	1) The printing position in the X direction is set to the origin (the left margin) on the X axis of the position management coordinate system.	
[Initial State]	-	
[Related Commands]	[Setting] Commands whose settings are affected by this command. None [Setting] Commands that change the effects of this command. None [Operation] Commands whose functionality is affected by this command. None [Operation] Commands that change the effects of this command. None	

CONFIDENTIAL

5.1.6. Control paper loading/ejecting ESC EM n

ESC EM n

Ver 1.00

[Name]	Control paper loading/ejecting	[Setting]
[Format]	1BH, 19H, n	
[Range of Definition]	n=52H (="R")	
[Function]	<ol style="list-style-type: none"> 1) The CSF (cut sheet feeder) receives the following commands, according to the value of n: n=31H select bin 1 for the next paper feeding, and for every paper fed thereafter n=43H cut the specified cut line and return to the loading position (roll paper only) n=52H eject paper 2) If n has any value other than the above, this command is ignored. 3) The ESC EM "R" will only eject paper fed from the CSF. If the paper being fed was not fed by the CSF, this command is ignored. 4) Bin selection settings apply to the next and subsequent paper feedings. 5) After the ESC EM "R" command ejects the paper, the printing position in the X direction is set to the origin on the X axis. 	
[Initial State]	-	
[Related Commands]	<p>[Setting] Commands whose settings are affected by this command. None</p> <p>[Setting] Commands that change the effects of this command. Bin selection is reset to its initial state by the ESC @ command.</p> <p>[Operation] Commands whose functionality is affected by this command. None</p> <p>[Operation] Commands that change the effects of this command. None</p>	

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5.1.7. Set absolute horizontal print position ESC (\$ nL nH m1 m2 m3 m4

ESC (\$ nL nH m1 m2 m3 m4

Ver 1.00

[Name]	Set absolute horizontal print position	[Operation]
[Format]	1BH, 28H, 24H, nL, nH, m1, m2, m3, m4	
[Range of Definition]	nL=04H, nH=00H $0 \leq \frac{(m4 * 1000000H + m3 * 10000H + m2 * 100H + m1) * 5760}{5760} \leq 323.991 \text{ mm}$ (absolute horizontal position setting value) OR $0 \leq \frac{(m4 * 1000000H + m3 * 10000H + m2 * 100H + m1) * 5760}{5760} \leq \frac{73472}{5760} \text{ inch}$ (absolute horizontal position setting value) 5760	
[Function]	1) The printing position in the X direction is set to the following positive value from the origin (left margin position) on the X axis of the position management coordinate system: $((m4 \times 256^3 + m3 \times 256^2 + m2 \times 256 + m1) \times (\text{absolute horizontal position setting value}))$ 2) If Left margin + $((m4 \times 256^3 + m3 \times 256^2 + m2 \times 256 + m1) \times (\text{absolute horizontal position setting value}))$ is beyond the right margin position, then this command is ignored. 3) This Command is only effective in graphics mode.	
[Initial State]	-	
[Related Commands]	[Setting] Commands whose settings are affected by this command. None [Setting] Commands that change the effects of this command. None [Operation] Commands whose functionality is affected by this command. None [Operation] Commands that change the effects of this command. The absolute horizontal position setting units are set by the ESC (U command). The absolute horizontal position setting units are reset to their initial state by the ESC @ and ESC (G commands). The absolute horizontal print position is restored to its initial, default setting by the ESC @ command.	

5.1.8. Set page length in defined unit (extended) ESC (C nL nH m1 m2 m3 m4

ESC (C nL nH m1 m2 m3 m4

Ver 2.00

[Name]	Set page length in defined unit(extended)	[Operation]
[Format]	1BH, 28H, 43H, nL, nH, m1, m2, m3, m4	
[Range of Definition]	nL=04H, nH=00H $0 \leq (m4 * 100000H + m3 * 10000H + m2 * 100H + m1) * 1440 / (\text{defined value}) \leq 1FFFFFFFH$	
[Function]	<ol style="list-style-type: none"> 1) The page length is set to $((mH \times 256) + mL) \times (\text{page management value}) * 25.4\text{mm}$. 2) If the formula applied values of mH and mL produces a value outside the Range of Definition, this command is ignored. 3) The Y axis origin of the page management coordinate systems and position management coordinate systems are set to the current Y direction printing position. The origin on the X axis is not changed at this time. 4) The top margin position is set to the origin on the Y axis. The bottom margin position is set to the position positive Y page length from the top margin. 	
[Initial State]	The page length is set to 558.8mm(22 inches).	
[Related Commands]	<p>[Setting] Commands whose settings are affected by this command. The top and bottom margin position settings set by the ESC (c commands are cleared.</p> <p>[Setting] Commands that change the effects of this command. The page length, the page management value, and the top and bottom margin positions are reset to their initial states by the ESC @ and ESC (G commands.</p> <p>[Operation] Commands whose functionality is affected by this command. New page processing by the FF command is affected (the amount of movement is changed). New lines generated by the LF command which go outside the printable area are affected. Processing by the ESC (v command is affected. Processing by the ESC (V command is affected.</p> <p>[Operation] Commands that change the effects of this command. The page management value is set by the ESC (U command.</p>	

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5.1.9. Set unit (extended) ESC (U nL nH P V H mL mH

Ver 2.00

ESC (U nL nH P V H mL mH

[Name]	Set unit(extended)	[Setting]
[Format]	1BH, 28H, 55H, nL, nH, P, V, H, mL mH	
[Range of Definition]	nL=05H, nH=00H $P = (mH * 256 + mL) = 180, 360, 720, 1440, 2880$ $V = (mH * 256 + mL) = 180, 360, 720, 1440, 2880, 5760$ $H = (mH * 256 + mL) = 180, 360, 720, 1440, 2880, 5760$	
[Function]	1) Set the following standard values in units of $b / (mH * 256 + mL) * 25.4mm$: The H parameter determines the horizontal position setting units The V parameter determines the vertical position setting units The P parameter determines the page management units 2) This Command is only effective in graphics mode.	
[Initial State]	Page management value: 0.071mm(1/360 inch) Relative horizontal position setting value: 0.141mm(1/180 inch) units Absolute horizontal position setting value: 0.423mm(1/60 inch) units Relative vertical position setting value: 0.071mm(1/360 inch) units Absolute vertical position setting value: 0.071mm(1/360 inch) units	
[Related Commands]	[Setting] Commands whose settings are affected by this command. None [Setting] Commands that change the effects of this command. None [Operation] Commands whose functionality is affected by this command. The relative horizontal position setting value used by the ESC ¥ and ESC(/ commands is set. The absolute horizontal position setting value used by the ESC \$ and ESC(\$ commands is set. The relative vertical position setting value used by the ESC (v command is set. The absolute vertical position setting value used by the ESC (V command is set. The unit page length specification value used by the ESC (C command is set. The page format specification value used by the ESC (c command is set. The paper dimension specification value used by the ESC (S command is set. [Operation] Commands that change the effects of this command. The printer settings are restored to their initial state to by the ESC @ command.	

5.1.10. Set absolute vertical print position (extended) ESC (V nL nH m1 m2 m3 m4

ESC (V nL nH m1 m2 m3 m4

Ver 2.00

[Name]	Set absolute vertical print position(extended)	[Operation]
[Format]	1BH, 28H, 56H, nL, nH, m1, m2, m3, m4	
[Range of Definition]	nL=04H, nH=00H (Vertical position set) = (mL + mH x 256) x (units set) $0 \leq (m4*1000000H + m3*10000H + m2*100H + m1) \times 1440 \leq 1FFFFFFFH$ (absolute vertical print position value)	
[Function]	<ol style="list-style-type: none"> 1) The printing position in the Y direction is set to a position spaced in the positive direction by $(m4*256*256*256 + m3*256*256 + m2*256 + m1) \times$ (absolute vertical print position value) from the Y axis of the position management coordinate system. 2) If the printing position in the Y direction has been set by this command to a non-printable area, then the paper is ejected, the position management coordinate system is set to the next page, and the printing position in the Y direction is reset to the origin upon the Y axis of the new position management coordinate system. 3) Settings made in the negative direction are ignored. 	
[Initial State]	-	
[Related Commands]		
[Setting]	Commands whose settings are affected by this command. None	
[Setting]	Commands that change the effects of this command. None	
[Operation]	Commands whose functionality is affected by this command. None	
[Operation]	Commands that change the effects of this command. The absolute vertical position value is set by the ESC(U commands. The range of unprintable areas are set by the ESC(c, ESC N and ESC O commands. The relative vertical position setting value, the non-printable area and the printing position in the Y direction are reset to their initial states by the ESC @ and ESC (G commands.	

5.1.11. Set page format (extended) ESC (c nL nH t1 t2 t3 t4 b1 b2 b3 b4

ESC (c nL nH t1 t2 t3 t4 b1 b2 b3 b4

Ver 2.00

[Name]	Set page format(extended)	[Setting]
[Format]	1BH, 28H, 63H, nL, nH, t1, t2, t3, t4, b1, b2, b3, b4	
[Range of Definition]	nL=08H, nH =00H $0 < t1, t2, t3, t4, b1, b2, b3, b4 \leq 255$ $0 \leq \frac{(t4 * 1000000H + t3 * 10000H + t2 * 100H + t1)}{(\text{defined unit})} \leq 1FFFFFFFH$ $0 \leq \frac{(b4 * 1000000H + b3 * 10000H + b2 * 100H + b1)}{(\text{defined unit})} \leq 1FFFFFFFH$ $(t4 * 1000000H + t3 * 10000H + t2 * 100H + t1) < (b4 * 1000000H + b3 * 10000H + b2 * 100H + b1)$	
[Function]	<ol style="list-style-type: none"> The origin on the Y axis of the position management coordinate system is set to: $+ (t4 * 256 * 256 * 256 + t3 * 256 * 256 + t2 * 256 + t1) \times (\text{defined unit})$ from the origin on the Y axis of the page management coordinate system. The bottom margin is set at a position spaced in the positive direction to: $(b4 * 256 * 256 * 256 + b3 * 256 * 256 + b2 * 256 + b1) \times (\text{defined unit})$ from the origin on the Y axis of the position management coordinate system. The printing position in the Y direction is shifted to the origin of the position management coordinate system. At this time, the origin on the X axis is not changed. If the distance from the origin on the Y axis of the position management coordinate system to the bottom margin position is greater than the page length, then this distance from the origin on the Y axis to the bottom margin position is set as the new page length. If the paper inserted for printing is cut sheet paper, then the distance from the top margin position to the bottom margin position is set as the page length. This command is only effective in graphics mode. In the case that it received this command immediately after the paper is loaded, it moves to the top margin location that was designated. 	
[Initial State]	The top margin position is set to 8.382mm(0.33 inches) . The bottom margin position is set to the page length. The page length is set to 558.8mm(22 inches).	
[Related Commands]	[Setting] Commands whose settings are affected by this command. The set page length is changed by the ESC (C command). [Setting] Commands that change the effects of this command. The top margin and the bottom margin are set by the ESC commands. The page length and the bottom margin position are returned to their initial states by the ESC @ and the ESC (G commands). [Operation] Commands whose functionality is affected by this command. New page processing by the FF command is affected (the amount of movement is changed). New lines generated by the LF command which go outside the printable area are affected. Processing by the ESC (v command is affected). Processing by the ESC (V command is affected). [Operation] Commands that change the effects of this command. The page management units are set by the ESC (U command).	

5.1.12. Monochrome Mode / Color Mode Selection ESC (K nL nH m n

Ver 1.00

ESC (K nL nH m n

[Name]	Monochrome Mode / Color Mode Selection	[setting]
[Format]	1BH, 28H, 4BH, nL, nH, m, n	
[Range of Definition]	nL=02H, nH=00H m=00H n=00H, 01H, 02H	
[Function]	<ol style="list-style-type: none"> 1) Monochrome mode or color mode is selected. n=00H: Default mode (color mode) n=01H: Monochrome mode n=02H: Color mode 2) When monochrome mode is selected, the color selection commands ESC r and ESC (r are ignored. Furthermore, the results of color raster commands which have been dispatched in monochrome mode are unpredictable. 3) If n has any value other than the above, this command is ignored. 	
[Initial State]	Default mode.	
[Supplementary Note]	Higher throughput speeds may be obtained for printing monochrome data when monochrome mode is selected rather than color mode. For printing in color, the color mode must be selected.	
[Related Commands]	<p>[Setting] Commands whose settings are affected by this command. When monochrome mode is selected, color settings mode using the ESC r and ESC (r commands are ignored.</p> <p>[Setting] Commands that change the effects of this command. The default mode is selected by the ESC @ command.</p> <p>[Operation] Commands whose functionality is affected by this command. None.</p> <p>[Operation] Commands that change the effects of this command. None.</p>	

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5.1.13. Selects dot size ESC (e nL nH m d

ESC (e nL nH m d

Ver 1.00

[Name]	Selects dot size	[Setting]
[Format]	1BH, 28H, 65H, nL, nH, m, d	
[Range of Definition]	nL=02H, nH=00H m=00H, d=00H, 10H, 21H, 25H, 33H, 34H	
[Function]	<ol style="list-style-type: none"> 1) The dot size is set according to the value of d. 2) The d parameter has the following meaning: <ul style="list-style-type: none"> d=00H: Default(MC1-1 1bit(for DOS)) d=10H: Economy d=21H: MC1-1 2bit d=25H: MC1-5 2bit d=33H: MC2-3 2bit d=34H: MC2-4 2bit 3) Default dot sizes are specific to each printer model. 4) Dot control is valid irrespective of printing mode or printing density. 5) If the dot size is changed part way through a page, the results are unpredictable. 6) If n has any value other than the above, this command is ignored. 	
[Initial State]	Default	
[Related Commands]	<p>[Setting] Commands whose settings are affected by this command. Use of the ESC . command requires this command to be sent as follows: ESC (e 2 0 0 0</p> <p>[Setting] Commands that change the effects of this command. Default dot size is automatically selected by the ESC @ or ESC (G commands.</p> <p>[Operation] Commands whose functionality is affected by this command. None</p> <p>[Operation] Commands that change the effects of this command. None</p>	

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5.1.14. Set relative vertical print position (extended) ESC (v nL nH m1 m2 m3 m4

ESC (v nL nH m1 m2 m3 m4

Ver 2.00

[Name]	Set relative vertical print position(extended)	[Setting]
[Format]	1BH, 28H, 76H, nL, nH, m1, m2, m3, m4	
[Range of Definition]	nL=04H, nH=00H $0 \leq (m4*100000H + m3*10000H + m2*100H + m1) \times 1440 \leq 1FFFFFFFH$ (relative vertical print position value)	
[Function]	<ol style="list-style-type: none"> The printing position in the Y direction is set to positive: $(m4*256*256*256 + m3*256*256 + m2*256 + m1) \times$ (relative vertical print position value) from the present Y printing position. If the position set by this command is higher than the top margin position on the current page, this command is ignored. If the Y direction printing position set by this command extends to a non-printable area, then the position management coordinate system is set to the next page; and the printing position in the Y direction is reset to the origin on the Y axis of the new position management coordinate system. 	
[Initial State]	-	
[Related Commands]	[Setting] Commands whose settings are affected by this command. None [Setting] Commands that change the effects of this command. None [Operation] Commands whose functionality is affected by this command. None [Operation] Commands that change the effects of this command. The relative vertical position setting value is set by the ESC (U command). The non-printable area is set by the ESC (c commands). The relative vertical position setting value, the non-printable area, and the printing position in the Y direction are reset to their initial states by the ESC @ and ESC (G commands).	

CONFIDENTIAL

5.1.15. Print raster graphics ESC . c v h m nL nH d1...dk (c=0,1)

Ver 1.00

ESC . c v h m nL nH d1...dk (c=0,1)

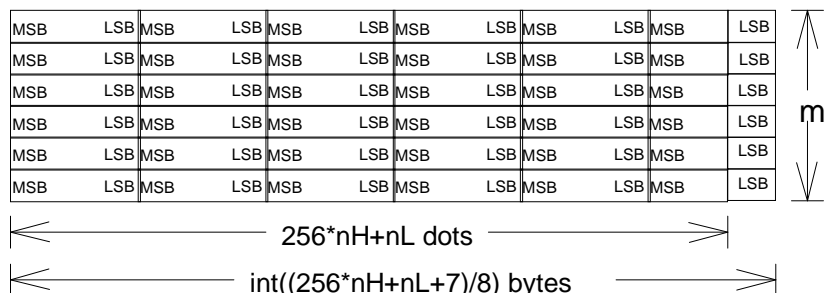
[Name]	Print raster graphics	[Operation]
[Format]	1BH, 2EH, c, v, h, m, nL, nH, d1...dk	
[Range of Definition]	c=0, 1, 2 (a description of the behaviour of this function when c == 2 is in the next section) v=10 (v/3600 dpi) h=10 (h/3600 dpi) 0 ≤ nL ≤ 255 0 ≤ nH ≤ 127 0 ≤ d ≤ 255 m=1, 8, 24 (color mode)	

[Function] This function prints raster graphics at c style compression, with y/3600 dpi vertical density, and h/3600 dpi horizontal density, to print out m raster lines, or scan lines, or rows of dots in the vertical direction, covering (nH * 256) + nL total dots, using k subsequent bytes of data.

- 1) If c has any value other than those specified above, this command terminates at the instant that c is processed.
If either v or h has any values other than the above, this command is ignored.
- 2) The actual image pattern is generated according to a raster method determined by the following parameters:
 - c: printing mode
 - 00H: full graphics mode (non-compressed mode)
 - 01H: run-length encoded compression mode
 - 02H: TIFF compression mode
 If TIFF compression mode is used, then m must be equal to 1.
Explanation of this function where c = 2 is in the next section
 - v: printing density in the vertical direction v/3600 (dpi)
 - h: printing density in the horizontal direction h/3600 (dpi)
 - m: number of dots (rows) in the vertical direction, number of raster or scan lines
 - nL, nH: number of dots covered in the horizontal direction = ((256 * nH) + nL)
 - k: number of items of data = m x int((nH x 256 + nL + 7)/8) for uncompressed data
= undeterminable amount for compressed data
 - d: data

Full graphics mode (non-compressed mode)

In full graphics mode, all of the data is transferred in raster format. Raster data that extends beyond the ((256 * nH) + nL) dot area boundary will be automatically clipped or discarded. The total amount of data sent is k = int((256 * nH + nL + 7)/8) x m bytes.



Run-length encoding compression mode

In run-length encoding compression mode, the data to be printed is always transferred in the format (counter) + (data), where counter represents one byte of information.

If $0 \leq \text{counter} \leq 127$, then the data following the counter is non-compressed data, and the length of the compressed data is (counter)+1 bytes.

If $128 \leq \text{counter} \leq 255$, then the data following the counter will be one byte of compressed data, . This single compressed byte of data is thereafter to be repeated $257 - (\text{counter})$ times..

- 3) This function also increments the X printing position relative to the current X printing position by the amount: $(256 \times nH + nL) \times h / 3600 \times 25.4\text{mm}$.
If this command specifies an X position in the non-printable area (right margin), the right margin position is automatically reset to the X value of the new printing position.
- 4) If image data is designated for a non-printable area, then the image data designated for that area is ignored.

The following parameter combinations are supported by this command:

This printer doesn't have printer microweave mode.

1. Case of microweave mode off

Mode (V x H)	Parameter				ESC(e*3 n2	Used Nozzle number	Comment
	c	v	h	m			
360x360	0/1/2	10	10	1/8/24	00h	90Nozzles	*1 *2

*1 In these circumstances, it is recommended to set m equal to 1.

*2 Whenever the ESC . command is used, the Normal (ESC (e 2 0 0 0)) size must be selected.

[Initial State]
[Related Commands]

Character mode

[Setting] Commands whose settings are affected by this command.

None

[Setting] Commands that change the effects of this command.

None

[Operation] Commands whose functionality is affected by this command.

None

[Operation] Commands that change the effects of this command.

None

5.1.16. Set paper dimensions ESC (S nL nH w1 w2 w3 w4 l1 l2 l3 l4

Ver 1.00

ESC (S nL nH w1 w2 w3 w4 l1 l2 l3 l4

[Name] Set paper dimension

[Format] 1BH, 28H, 53H, nL, nH, w1, w2, w3, w4, l1, l2, l3, l4

[Range of Definition]

nL=08, nH=00H

$0 \leq (w4*1000000H + w3*10000H + w2*100H + w1) * 1440 / (\text{defined unit}) \leq 7FFFFFFFH$

$0 \leq (l4*1000000H + l3*10000H + l2*100H + l1) * 1440 / (\text{defined unit}) \leq 7FFFFFFFH$

[Function]

- 1) Set paper length (from top-edge to bottom-edge) and paper width (from left-edge to right-edge) in the defined unit.
- 2) This command is used to expand the bottom-margin (3mm) of printer.
- 3) Paper length and width is defined by the following formula:
physical paper length = $(l4*1000000H + l3*10000H + l2*100H + l1) * (\text{defined unit})$
physical paper width = $(w4*1000000H + w3*10000H + w2*100H + w1) * (\text{defined unit})$
- 4) This command can be used only during graphics mode, entered by sending the ESC (G command.
- 5) This command will work effectively only when the defined paper length is the same as the physical paper length measured by the printer.
- 6) If some portion of an image extend beyond the bottom edge of the page, then that extended portion of the image is deleted.
Also, if the defined paper length is shorter than the actual paper length, the portion of an image beyond the defined paper length will be deleted.
- 7) Paper width is ignored by the printer.

[Initial State] -

[Related Commands]

[Setting] Commands whose settings are affected by this command.

None

[Setting] Commands that change the effects of this command.

The page control setting unit is set by the ESC (U command.

[Operation] Commands whose functionality is affected by this command.

None

[Operation] Commands that change the effects of this command.

The initial state is returned to by the ESC @ command.

The initial state is returned to by the ESC(G command.

5.1.17. Set the raster image resolution ESC (D nL nH rL rH v h

Ver 1.00

ESC (D nL nH rL rH v h

[Name] Set the raster image resolution
 [Format] 1BH, 28H, 44H, nL, nH, rL, rH, v,h
 [Range of Definition]
 nL=04H, nH=00H
 0 <= v <= 127
 0 <= h <=127

[Function]
 1) Sets the raster image resolution (ESC i).
 Vertical resolution : (rH*256 + rL) / v dpi
 Horizontal resolution : (rH*256 + rL) / h dpi
 2) Available resolutions are : 120, 180, 360, 720dpi
 3) Following parameters are supported.

This printer doesn't have printer microweave mode.

1. Case of microweave mode off

Mode (V x H)	ESC (D		ESC i	ESC(e	Used Nozzle number	Comment
	v / r	h / r	mH*256+mL	n2		
360x90	4/1440	16/1440	90	10h/33h/34h	90Nozzles	
720x90	2/1440	16/1440	90	21h/25h	90Nozzles	

*1 The parameter (mH*256+mL)=1 is recommended.

*2 This command may be especially useful in circumstances where programmers utilize their own chosen algorithms to improve print quality.

[Initial State] -

[Related Commands]

[Setting] Commands whose settings are affected by this command.

The Resolution set of Raster image exerts the influence on the processing by the ESC i command .

[Setting] Commands that change the effects of this command.

The Resolution setting of Raster image is returned to the initial states by the ESC @ and the ESC (G commands.

[Operation] Commands whose functionality is affected by this command.

None

[Operation] Commands that change the effects of this command.

None

5.1.18. Transfer Raster image ESC i r c b nL nH mL mH d1.....dk

Ver 1.00

ESC i r c b nL nH mL mH d1.....dk

[Name] Transfer Raster image
 [Format] 1BH,69H, r, c, b, nL, nH, mL, mH, d1, d2, ..., dk
 [Range of Definition]
 r = 00H, 01H, 02H, 04H, 11H, 12H
 c = 00H, 01H
 b = 01H, 02H
 0000H <= (nH*256 + nL) <= 7FFFH
 0001H <= (mH*256 + mL) <= 7FFFH

[Function]

- 1) Prints dot graphics in raster format.
- 2) Parameters are used as described below:
 - r : color of ink
 - 00H: Black
 - 01H: Magenta
 - 02H: Cyan
 - 04H: Yellow
 - 11H: Light Magenta
 - 12H: Light Cyan
 - c : compression method
 - 00H: non-compressed
 - 01H: Run Length Encoding
 - b : bit length required for each pixel of image data
 - 01H: 1bit/pixel (for Micro, Normal x 1 x 2 dot)
 - For every 1 bit of data:
 - 0 no dot
 - 1 a normal size dot
 - will be printed at the pixel location for that one bit.
 - 02H: 2bits per pixel (for dot sizes requiring 2 bits to designate the size)
 - For every 2 bits of data:
 - 00 no dot
 - 01 a small dot
 - 10 a medium size dot
 - 11 a large size dot
 - will be printed at the pixel location for those 2 bits.

Sample bits of data (for 4 pixels of an image), and the results of that data, are displayed in the upcoming diagram.

nL, nH: Horizontal byte count, according to the following formula:

$$\begin{aligned} nH &= \text{INT}(\text{horizontal byte count} / 256) \\ &= \text{INT}(((\text{horizontal dot count}) * (\text{bit length of each pixel}) + 7) / 8) / 256 \\ nL &= \text{MOD}(\text{horizontal byte count} / 256) \\ &= \text{MOD}(((\text{horizontal dot count}) * (\text{bit length of each pixel}) + 7) / 8) / 256 \end{aligned}$$

mL, mH: Vertical dot count (rows of dot graphics), according to the following formula:

$$\begin{aligned} mH &= \text{INT}(\text{vertical dot count} / 256) \\ mL &= \text{MOD}(\text{vertical dot count} / 256) \end{aligned}$$

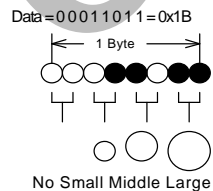
k : Total numbers of data bytes, according to the following formula:

$$k = (nH * 256 + nL) * (mH * 256 + mL)$$

**** Sample bits of data for 4 pixels of an image using 2 bits data/pixel:**

The size of the dot is designated with a binary number, using 2 bits for every 1 picture element.

No Dot: 00, small dot: 01, medium dot: 10, large dot: 11



[Initial State] -

5.1.19. Turn unidirectional mode on/off ESC U n

Ver 1.00

ESC U n

[Name]	Turn unidirectional mode on/off	[Setting]
[Format]	1BH, 55H, n	
[Range of Definition]	n=00H, 01H, 02H, 30H, 31H, 32H	
[Function]	<ol style="list-style-type: none"> 1) The printing direction is selected according to the value of n in the following manner: <ul style="list-style-type: none"> n=00H or 30H: selects bi-directional printing n=01H or 31H: selects unidirectional printing (0 to 80 column) n=02H or 32H: selects best suited printing n=03H or 33H: selects unidirectional printing (80 to 0 column) 2) If n has any value other than the above, this command is ignored. 	
[Initial State]	Bi-directional printing	
[Related Commands]	<p>[Setting] Commands whose settings are affected by this command. ESC @ initialized values may be cancelled by this command.</p> <p>[Setting] Commands that change the effects of this command. ESC @ command will return the printer to its Initial State values.</p> <p>[Operation] Commands whose functionality is affected by this command. None</p> <p>[Operation] Commands that change the effects of this command. None</p>	

CONFIDENTIAL

5.1.20. Set relative horizontal print position ESC (/ nL nH n1 n2 m1 m2

ESC (/ nL nH n1 n2 m1 m2

Ver 1.00

[Name]	Set relative horizontal print position	[Operation]
[Format]	1BH, 28H, 2FH, nL, nH, m1,m2,m3,m4	
[Range of Definition]	nL=04H, nH=00H $0 \leq ((m4 * 100000H) + (m3 * 10000H) + (m2 * 100) + m1) \times 5760 \leq 323.991 \text{ mm} = 73472 \text{ inches}$ (relative horizontal position setting value)	5760

If bit 7 of m4 is 1, then m4 will be a negative value.

- [Function]
- 1) If bit 7 of m4 is 1, then m4 will be a negative value. Negative values are expressed in two's complement.
 - 2) The printing position in the X direction is incremented from the current X position by the following amount
 $(m4 \times 256 \times 256 \times 256 + m3 \times 256 \times 256 + m2 \times 256 + m1) \times (\text{relative horizontal position setting value})$
 OR
 $((m4 \times 256^3) + (m3 \times 256^2) + (m2 \times 256) + m1) \times (\text{relative horizontal position setting value})$
 The relative horizontal position setting value is set with the ESC (U command).
 The defined default value for this command is 0.423mm(1/60inch).
 - 3) If the position set by this command is within the non-printable area it is ignored. However, it is possible to shift to a position in the right margin area.
 - 4) This command is only effective in graphics mode.

[Initial State]

-

[Related Commands]

[Setting] Commands whose settings are affected by this command.

None

[Setting] Commands that change the effects of this command.

None

[Operation] Commands whose functionality is affected by this command.

None

[Operation] Commands that change the effects of this command.

The relative horizontal position setting value is set by the ESC (U command).

The relative horizontal position setting value is reset to its initial state by the ESC @ or the ESC (G commands).

5.1.21. Set Print method ID ESC (m nL nH n)

Ver 1.00

ESC (m n

[Name]	Set Print method ID	[Setting]
[Format]	1BH, 28H, 6DH, nL, nH, n	
[Range of Definition]	nL=01H, nH=00H n (see below)	
[Function]	1) The print mode is selected according to the values of n.	

用紙名称 Paper Type	Print Quality	Resolution H x V [dpi]	n [Hex] *3		
			~ L/4x6/ ハガキ	~A4/ Letter	~A3/ A3+
EPSON 写真用紙クリスピー Ultra Premium Glossy Photo Paper Ultra Premium Photo Paper Glossy (for U.S.A.)	Photo Super Photo	720 x 720 5760 x 1440	55 B0	54 B0	56 B3
EPSON 写真用紙 Premium Glossy Photo Paper Premium Photo Paper Glossy (for U.S.A.)	Photo Super Photo	720 x 720 5760 x 1440	55 B0	54 B0	56 B3
EPSON 写真用紙<絹目調> Premium Semigloss Photo Paper Premium Photo Paper Semi-Gloss(for U.S.A.)	Photo Super Photo	720 x 720 5760 x 1440	55 B0	54 B0	56 B3
Ultra Premium Luster Photo Paper	Fine Super Photo	720 x 720 5760 x 1440	55 B0	54 B0	56 B3
EPSON 写真用紙エントリー Glossy Photo Paper Photo Paper Glossy (for U.S.A.)	Fine Super Photo	720 x 720 5760 x 1440	55 B0	54 B0	56 B3
EPSON フォトマット紙 Matte Paper Heavyweight Premium Presentation Paper Matte(for U.S.A.) Premium Presentation Paper Matte Double-sided(for U.S.A.)	Photo	1440 x 720	54	54	56
Archival Matte Paper Enhanced Matte Paper Ultra Premium Presentation Paper Matte(for U.S.A.)	Fine Super Photo	720 x 720 5760 x 1440	54 B0	54 B0	56 B3
EPSON スーパーファイン紙 Photo Quality Inkjet Paper Presentation Paper Matte(for U.S.A.)	Photo	720 x 720	55	54	56
EPSON スーパーファイン専用ラベルシート	Photo	720 x 720	55	54	56
EPSON スーパーファイン専用ハガキ *1	Photo	720 x 720	55	54	56
普通紙 (両面上質普通紙<再生紙>)	Draft/Economy	360 x 360	10	10	10

用紙名称 Paper Type	Print Quality	Resolution H x V [dpi]	n [Hex] *3		
			~L/4x6/ ハガキ	~A4/ Letter	~A3/ A3+
Plain Paper Bright white Inkjet paper Bright white paper(for U.S.A.)	Normal	720 x 360	41	41	41
	Fine	720 x 720	51	51	52
郵便光沢ハガキ *1	Normal	360 x 360	57	57	57
	Fine	720 x 720	B0	B0	B0
郵便ハガキ (インクジェット紙) *1	Fine	720 x 720	57	57	57
郵便ハガキ *1	Normal	360 x 360	41	41	41
	Fine	720 x 720	51	51	51
ミニフォトシール Photo Stickers 16	Fine	5760 x 1440	B0	B0	B0
フォトシール フリーカット	Fine	5760 x 1440	B0	B0	B0
CD/DVD レーベル CD/DVD	Photo	5760 x 1440	B2	B2	B2
高画質対応 CD/DVD レーベル CD/DVD Premium Surface	Photo	5760 x 1440	B2	B2	B2
アイロンプリントペーパー *1	Normal	720 x 720	51	51	52
封筒	Normal	720 x 360	40	40	40
Envelope	Fine	720 x 720	50	50	50

*1 : Japanese model only.

*2 : U.S.A. model only.

*3 : In the case that CD/DVD is selected, the Unit No. "n" other than the CD/DVD load apparatus is B0H.

*4 : Black & White mode only.

2) If n have a value other than those above, this command is ignored.

3) This command is only effective in graphics mode.

[Initial State]

[Related Commands]

[Setting] Commands whose settings are affected by this command.

None

[Setting] Commands that change the effects of this command.

The ESC @ command selects black.

[Operation] Commands whose functionality is affected by this command.

None

[Operation] Commands that change the effects of this command.

The ESC (G command puts the printer in graphics mode.

CHAPTER 6 : REMOTE MODE

This section of the Programming Note will provide an overview of EPSON's Remote Mode. The following commands are useful for driver development:

Enter Remote Mode	“ESC (R”
Set Mechanism Sequence	“SN”
Exit Remote Mode	“ESC NUL”

These Remote Mode commands were used in “CHAPTER 4: COMMAND SEQUENCE” – “4.2 Command Transfer Procedure”. Individual explanations for these commands, and other remote mode commands referenced in this paper, are provided hereafter.

6.1. Remote Mode Language Description

In addition to EPSON's ESC/P and its extension ESC/P2 serial printer languages, most EPSON printers also implement another EPSON serial printer language that is bi-directional. That language is called Remote Mode. It is entered from ESC/P or ESC/P2 mode.

Remote Mode commands should not be sent to the printer in between consecutive ESC/P2 commands.

The primary purposes for EPSON Remote Mode printer control language are to provide the host with the following:

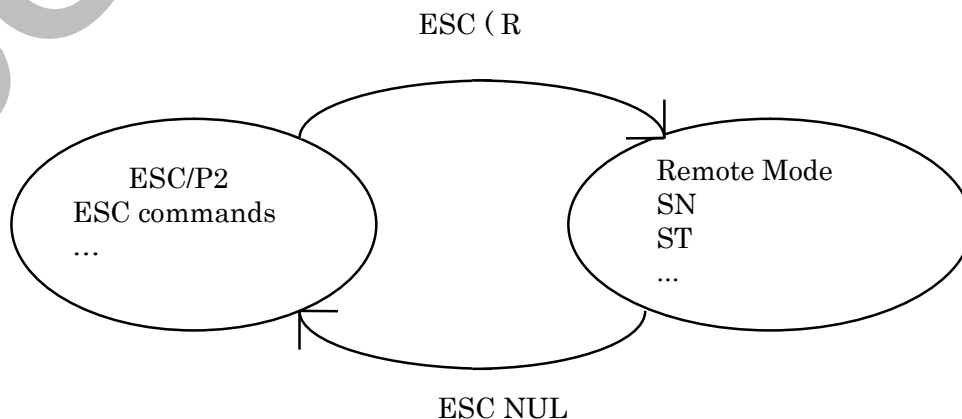
- 1) Current printer status
- 2) Printer identification
- 3) Capability of setting the printers front panel operations remotely (print the nozzle check pattern, clean print heads, set hard ware adjustments for paper size and thickness, save current settings into NVR (non-volatile RAM, print the dot alignment test pattern, etc.)

The Remote Mode command architecture is as follows:

Enter Remote Mode (leave ESC/P or ESC/P 2)
- change printer settings (model dependent) via Remote Mode Set commands and/or
- request printer settings (model dependent) via Remote Mode Reply commands
Exit Remote Mode (enter ESC/P or ESC/P 2)

Printer State Reply (printer state is automatically sent to the host if enabled by the Remote Mode command “ST” 02h 00h 00h m1 Turn printer state reply on/off)

The ESC/P2 - Remote Mode command architecture can be represented by the following simplified State Diagram.



All of the Remote Mode commands, except Enter Remote Mode, are available only in Remote Mode.

The Enter Remote Mode and Exit Remote Mode commands begin with the ESC code, (as do many ESC/P2 commands). Excluding these commands, Remote Mode commands generally follow the following format:

“XX” $n_L n_H < 256 \times n_H + n_L$ - number of parameter bytes>

The “XX” represents 2 ASCII characters that indicate the Remote Mode command primary function, and $n_L + (n_H \times 256)$ indicates the number of subsequent parameters.

If the first parameter following the length count is 00H then the Remote Mode command makes a setting.

Set printer settings: “XX” $n_L n_H$ 00H $m_1 \dots m_x$

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6.1.1. Enter Remote Mode (Remote Mode) ESC (R 08H 00H 00H "REMOTE1"

ESC "(R" 08H 00H 00H "REMOTE1"

Enter Remote Mode

[Format]

ESC (R 08H 00H 00H "REMOTE1"

[Function]

- * 1) The current emulation mode is terminated
- * 2) Print data present in the buffer is sent to the printer to be printed
- * 3) The printer enters remote mode.
- * Remote mode continues until the "Exit Remote Mode" command is received.
- * In the remote mode, XX [nL] [nH] [00H] [m1] ... [mx] type control codes are available.
- * This command is only valid in text mode.

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6.1.2. Load Power-On Default NVR into RAM (Remote Mode) "LD" 00H 00H

[Format]

"LD" 00H 00H

[Function]

Loads the power-on default from a non-volatile memory into RAM, and begins using these values as the current printer operating system settings.

This command is only available in Remote Mode.

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6.1.3. Set printer timer (Remote Mode) "TI" 08H 00H 00H YYYY MM DD hh mm ss

[Format]

"TI" 08H 00H 00H YYYY MM DD hh mm ss

- * Each of the parameters YYH,YYL,MM,DD,hh,mm and ss is a one byte binary format parameter, and their definitions as follows:

Parameter	meaning	Range
YYH	Year (A.D)	0-65535
YYL	(YYL+YYH*256)	
MM	Month	1-12
DD	Day	1-31
hh	hour	0-23
mm	minute	0-59
ss	second	0-59

[Function]

- * If the parameter is out of range, this command is ignored, and the previous setting is maintained.

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6.1.4. Set horizontal print position (Remote Mode) "FP" 03H 00H 00H m1 m2

[Format]

"FP" 03H 00H 00H m1 m2:

[Function]

* The parameter "m1", "m2" are each one byte binary data that indicate the below condition according to the following formula.

* The unit of print start position is 1/360 inch.

$$(\text{print start position}) = ((m2 * 256) + m1)$$

Horizontal Print Start Position	m1	m2
Standard position	00H	00H
Borderless print position (-3.5mm)	A0H	FFH
Borderless print position (-2.5mm)	B0H	FFH

* If the parameter is out of range , this command is ignored, and the previous setting is maintained.

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6.1.5. Turn printer state reply on/off (Remote Mode) “ST” 02H 00H 00H m1

[Format]

“ST” 02H 00H 00H m1

[Parameters]

* Parameter m1 is one byte binary parameter, and indicates the setting as follows:

m1	Printer State Reply
10H	Binary state reply Off
11H	Binary state reply On

[Function]

- The default environment status transmission is set. See the paragraph of status transmission for the status transmission.
- This setting depends on interfaces that receive this command. For example, this command is received with the built-in Macintosh serial interface, the status transmission for the built-in Macintosh serial interface is set.
- If the parameter m1 is out of range, or if setting of parameter m1 is not supported by the product, this command is ignored, and the existing setting is maintained.
- This command is only available in Remote Mode.

Auto interface select function

- If the status transmission is ON, the interface transmits the status whether the interface is selected or the interface is deselected by the auto interface select function.

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6.1.6. Job name set “JH” nL nH 00H m1 m2 m3 m4 m5 <job name>

[Format]

“JH” nL nH 00H m1 m2 m3 m4 m5 <job name>

nL = (length of <job name>) + 6
nH = 00H

[Parameters]

The parameter “m1” is one byte binary data that indicates job name information kinds.
The parameters “m2”, “m3”, “m4”, “m5” are each one byte binary data that indicates Job ID.
“<job name>” is maximum 32 bytes binary codes that describe a job name.

m1=00h:<job name>=Host name(Max 32byte)

m1=01h:<job name>=Product ID

m1=02h:<job name>=Document name

m1=03h:<job name>=User name

[Function]

Set the job name of the job specified by “JS” command.
This command is available only in Remote.

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6.1.7. Start job “JS” nn 00H 00H <job name> m1

6.1.8. End job “JE” 01H 00H 00H

[Format]

```
“JS” nL nH 00H <job name> m1
“JE” 01H 00H 00H
```

nL = (length of <job name>) + 2
nH = 00H

[Parameters]

The parameter “m1” is one byte binary data that fixed to zero.

[Function]

Construct a print job, and turn page and line position reply on/off, and set the position reply repeat rate if the position reply is enabled.

If the host uses the cancel job command or it needs the page and line position reply, it must send print data as a print job.

The print job is started with the “JS” command and terminated with the “JE” command. After starting a job with the “JS”, if the “JS” is sent again without the “JE”, the previous print job will be terminated with the second “JS”.

After power-on initialization, the print job is not defined, and position reply is disabled.

This command is available only in Remote.

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6.1.9. Select paper media “MI” 04H 00H 00H m1 m2 m3

[Format]

“MI” 04H 00H 00H m1 m2 m3

[Parameters]

The parameter “m1”, “m2” and “m3” are each one byte binary data.

The “m1” is always 01H.

The “m2” describes paper media as shown below.

m2	用紙種類	Paper Type
0	普通紙	Plain Paper
2	アイロン [®] リント [®] ー [®] ー	Iron-On Cool Peel Transfer Paper
5	フォトマット紙	Matte Paper-Heavyweight
8	ミニフォトシール	Photo Stickers 4/16
11	写真用紙<光沢>	Premium Glossy Photo Paper
12	写真用紙<絹目調>	Premium Semigloss Photo Paper
13	-----	Premium Luster Photo Paper
27	郵便ハガキ (再生紙)	-----
28	郵便ハガキ (インクジェット紙)	-----
29	スーパーファイン紙	Photo Quality Ink Jet Paper
37	封筒	Envelope
38	写真用紙クリスピー<高光沢>	Ultra Glossy Photo Paper (Euro) Ultra Premium Glossy Photo Paper (U.S.A.)
42	郵便光沢はがき	-----
43	写真用紙エントリー<光沢>	Photo Paper Glossy (U.S.A.) Glossy Photo Paper (Euro/Asia)
49	EPSON 両面マット紙 (名刺サイズ)	-----
91	CD/DVD レーベル	-----
92	高画質対応 CD/DVD レーベル	-----
99	クリーニングシート	-----

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The "m3" describes paper size as shown below.

m3	Paper Size	
0	A4	
1	Letter(8 1/2x11 in)	
2	Legal(8 1/2x14 in)	
3	A5	
4	A6	
5	B5	
7	Half-Letter(5 1/2x8 1/2 in)	
8	Panoramic Photo Paper	
9	Photo Paper(4 x 6 in) ミシ目入	
10	Photo Paper(4 x 6 in)	
11	5x8 in	
12	8x10 in	
13	Photo Paper (100x150 mm)	
14	Photo Paper (200x300 mm)	
15	L 判	
16	ハガキ	
17	往復ハガキ	
18	Envelope #10(4 1/8x9 1/2 in)	landscape
19	Envelope C6	landscape
20	Envelope DL	landscape
21	Envelope(220x132 mm)	landscape
22	長形 3 号	
23	長形 4 号	
24	洋形 1 号	
25	洋形 2 号	
26	洋形 3 号	
27	洋形 4 号	
28	5x7 in(2L 判)	
29	Envelope #10(4 1/8x9 1/2 in)	portrait
30	Envelope C6	portrait
31	Envelope DL	portrait
32	Envelope(220 x 132 mm)	portrait
33	名刺 89 x 55 mm	
34	Business card 89x50 mm	
35	カード 54x86 mm	
36	名刺 55x91 mm	
37	フォトアルバム背表紙 127x184mm	
38	フォトアルバム背表紙 210x303mm	
39	フォトアルバム L 判横 127x198mm	
40	フォトアルバム 2L 判 127x177.9mm	
41	フォトアルバム A5 横 210x148.3mm	
42	フォトアルバム A4 210x296.6mm	
43	Hi-vision 102x180 mm	
61	A3 ノビ (Super A3/B)	
62	A3	
63	B4	
64	US B(11x17 in)	
65	11 x14 in	
66	B3	
67	A2	
68	US C(17x22 in)	
69	四切 254x305mm (10x12")	
70	12" x 12" (308.4 x 308.4mm)	
99	User-defined	

[Function]

Set paper type to the temporary default.
The previous setting will be kept if the parameters are out of range.
This command is available only in Remote.

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6.1.10. User Setting “US” 03H 00H 00H m1 m2

[Format]

“US” 03H 00H 00H m1 m2

[Parameters]

The parameter “m1”, “m2” are each one byte binary data that indicates shown as below.

“m1”	Item	“m2”	Setting
00H	Bottom margin setting	00H	0 = Standard
		01H	1 = Max
		02H	2 = Borderless
01H	Platen gap setting	00H	Normal
		01H	Platen gap setting 1
		02H	Platen gap setting 2
		:	:
		FFH	Platen gap setting 255
02H	Data cut flag information	00H	No cut
		01H	Cut
03H - FFH	Reserved		

[Function]

Select a printer setting shown upper to the temporary default.
The previous setting will be kept if the parameters are out of range.
This command is available only in Remote.

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6.1.11. Set mechanism sequence "SN" 01H 00H 00H

[Format]

"SN" 01H 00H 00H

[Parameters]

None

[Function]

- * Changes the mechanical sequence from the default environment to the values specified by the below command. If the below command is not sent, the printer selects the plain paper mechanical sequence.

Item	Command
Paper path	PP command
Duplex Printing	DP command
Color / Monochrome setting	ESC (K command
Set Print method ID	ESC (m command
Paper types	MI command
Platen gap setting	US command
Bottom margin setting	US command
Check paper size	US command

- * This command is only valid in remote mode.

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6.1.12. Select paper path “PP” 03H 00H 00H m1 m2

[Format]

“PP” 03H 00H 00H m1 m2

[Parameters]

The parameter “m1” and “m2” are each one byte binary data.

The “m1” describes paper is continuous type or a single sheet in CSF or a manual inserted sheet as shown below.

Paper	m1	m2
ASF	01H	FFH
Reserved	02H	00H
CD-R	02H	01H

[Function]

Select paper path to be used for the temporary default.

The previous setting will be kept if the parameter “m1” and “m2” exceeds its limit.

This command is available only in Remote.

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6.1.13. Terminate Remote Mode (Remote Mode) ESC 00H 00H 00H

[Format]

ESC 00H 00H 00H

[Function]

- * Copy the default environment to the current setting.
- * Execute the ESC “@” command in ESC/P2. (Execute software initialisation.)
- * Exit from Remote mode and enter to the selected printer control language.

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6.1.14. Save Setting “SV” 00H 00H

[Format]

“SV” 00H 00H

[Function]

- * The default setting is saved to NVRAM as the default setting at power on. The all default settings are not necessarily saved.
- * This command is available only in Remote.

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CHAPTER 7 : STATUS REPLY CODE SPECIFICATION

The EP-4004/Artisan 1430/Stylus Photo 1430W/1500W printer can send its current state to the host computer via the parallel interface which is IEEE-1284 nibble mode (reverse channel) compatible, or USB interface. The printer can be set to update the host every few seconds, or when the printer status changes. The Printer Status Reply consists of the string below. Varying parameters of the string reflect the current printer status. By monitoring this information on the host computer, you can provide users with basic yet very practical information that can make it easier for customers to use your software and EP-4004/Artisan 1430/Stylus Photo 1430W/1500W ink jet printers.

EP-4004/Artisan 1430/Stylus Photo 1430W/1500W printer supports new binary state reply format.

Format of reply strings:

@BDC [SP] ST2 [CR] [LF]

Reply count (2byte)

each status information

...

The parameter of total bytes are two byte binary codes that indicate the byte counter from next data to the last data by the little endian.

The structure of each information field is as shown.

Item	Byte	explanation
Header	1	Header No.
Parameter count	1	Parameter byte counter
Parameter	n	Parameter value

The Header is one binary code that is shown the list of next page.

The parameter count is one binary code that indicates the parameter byte counter of each field.

The parameter are binary codes that indicate the information of each field.

The structure of Ink cartridge information field is as shown.

Item	Byte	explanation
Header	1	Header No.
Parameter count	1	Parameter byte counter
Parameter count of each color	1	Parameter byte counter of each color
Parameter	n	Parameter value

The parameter count of each color is one binary code that indicates the parameter byte counter of each color.

7.1. Status code

Structure

Item	Byte(Hex)	Value(Hex)
Header	1	01
Parameter counter	1	01
Parameter	1	<Status code>

The parameter <Status code> is one byte Binary code that indicates status code as follows.

Status	Status code
In the error state	00
In the self printing state	01
In the busy state	02
In the waiting state	03
In the idle state	04
In the cleaning state	07
In the factory shipment state	08
In the shutdown state	0A

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7.2. Error code

Structure

Item	Byte(Hex)	Value(Hex)
Header	1	02
Parameter counter	1	01
Parameter	1	<Error code>

The parameter < Error code > is one byte Binary code that indicates error code as follows.

Error	Error code
Fatal error	00
Other I/F is selected	01
Cover Open (CDR guide open error)	02
Paper jam	04
Ink out	05
Paper out	06
Ink overflow error	10
Double Feed Error	12
CDR tray out error	29
Card loading Error	2A
CD-R Guide Error	38
Cover Open Error	4A

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7.3. Warning code

Structure

Item	Byte(Hex)	Value(Hex)
Header	1	04
Parameter counter	1	Warning kinds
Parameter	n	Occurred all warning code

The parameter <warning code> is one-byte Binary and indicates the warning code as follows, <warning code> is consisted of the several fields as shown below.

When several warning appears at the same time, reply all the warning codes with the format below.

value [value value].

<warning code> field is recognized in the following warning state. (This field is not recognized in @BDC-ST character string when no warning is received)

For ink low warning, the order depends on the ink cartridge order.

Ink low warning (10H-18H) occurs when the ink quantity is less than defined amount. If the ink quantity is less than the one that can execute head cleaning, cleaning disable warning (51H-59H) occurs with the ink low warning (10H-18H) together.

Warning	Warning code
Ink low (Yellow)	10
Ink low (Black)	11
Ink low (Light Cyan)	12
Ink low (Light Magenta)	13
Ink low (Magenta)	14
Ink low (Cyan)	15
Cleaning disable (Yellow)	51
Cleaning disable (Black)	52
Cleaning disable (Light Cyan)	53
Cleaning disable (Light Magenta)	54
Cleaning disable (Magenta)	55
Cleaning disable (Cyan)	56

7.4. Paper path

Structure

Item	Byte(Hex)	Value(Hex)
Header	1	06
Parameter counter	1	02
Parameter	2	paper path information

The parameter <paper path> is two bytes Binary code that indicate current paper path.

Paper Path	code
Cut sheet	01FF
CD-R	0201

7.5. Cleaning time information

Structure

Item	Byte(Hex)	Value(Hex)
Header	1	0Ch
Parameter counter	1	02h
Parameter	2	Cleaning time information

The parameter < cleaning time information > is two bytes Binary codes that indicate cleaning time or ink filling time. The unit is second. (This time is total time not passage time or remain time.)

This parameter is added only when status code ST = 07H.

7.6. Replace cartridge information

Structure

Item	Byte(Hex)	Value(Hex)
Header	1	0Eh
Parameter counter	1	01
Parameter	1	Replace cartridge information

The parameter < change cartridge information > is one byte Binary code that indicates the information about ink cartridge. 00 means that any ink cartridge is changed.

- Bit0 : The 1st data of 0F field
- Bit1 : The 2nd data of 0F field
- Bit2 : The 3rd data of 0F field
- Bit3 : The 4th data of 0F field
- Bit4 : The 5th data of 0F field
- Bit5 : The 6th data of 0F field

If the plural ink cartridges are changed at the same time, the both bits set 1.

7.7. Ink information

Structure

Item	Byte(Hex)	Value(Hex)
Header	1	0Fh
Parameter total counter	1	13h
Parameter counter for 1 I/C	1	3h
Parameter	3 per 1 I/C	Ink information

The ink information order is Yellow, Magenta, Cyan, Matte Black, Photo Black, Red, Orange, Gloss Optimizer, Blue. Each ink cartridge information is consisted of m1, m2, m3.

Ink information	code
m1	Ink cartridge name 01h: "Black Ink Cartridge" 03h: "Cyan Ink Cartridge" 04h: "Magenta Ink Cartridge" 05h: "Yellow Ink Cartridge" 06h: "Light Cyan Ink Cartridge" 07h: "Light Magenta Ink Cartridge"
m2	Ink color 00H: Black 01H:Cyan 02H:Magenta 03H:Yellow 04H:Light Cyan 05H:Light Magenta
m3	no cartridge : "n" cartridge in : "i"

7.8. Loading path information

Structure

Item	Byte(Hex)	Value(Hex)
Header	1	10h
Parameter counter	1	6h
Parameter	9	01, 0C, 4E, 08, 4E, 4E

7.9. Cancel code

Structure

Item	Byte(Hex)	Value(Hex)
Header	1	13h
Parameter counter	1	01h
Parameter	1	Cancel request

The parameter < cancel code > is one byte Binary code that indicates the cancel request.

Cancel request	Code
No request	01
The status during received cancel command and initialize the printer	A1
Request	81

7.10. Job name Information

Structure

Item	Byte(Hex)	Value(Hex)
Header	1	19h
Parameter counter	1	n (Max 37)
Parameter	Max 37	Job name information

The parameter < Job name information > is n bytes Binary codes.
It indicates the m1 to m5 parameter and Job name specified by JH command.

If the JH command is not send of printing job, it replies "unknown".

Item	Byte(Hex)	Value(Hex)
Header	1	19h
Parameter counter	1	0Ch
Parameter	0Ch	000000000 "unknown"

CHAPTER 8 : Device ID

The EPSON EP-4004/Artisan 1430/Stylus Photo 1430W/1500W printer can send its device ID when it is requested.

When IEEE1284.4 is enabled,
@EJL<SP>ID<CR><LF>
MFG:EPSON;
CMD:ESCPL2,BDC,D4,D4PX,ESCPR1;
MDL:*Model Name*;
CLS:PRINTER;
DES:EPSON<SP>*Model Name*;
CID:EpsonRGB;
FID:FXN, DPN, WFA, ETN, AFN, DAN;

When IEEE1284.4 is disabled,
@EJL<SP>ID<CR><LF>
MFG:EPSON;
CMD:ESCPL2,BDC,ESCPR1;
MDL: *Model Name*;
CLS:PRINTER;
DES:EPSON<SP> *Model Name*;
CID:EpsonRGB;
FID:FXN, DPN, WFA, ETN, AFN, DAN;

<i>Model Name</i>	
Artisan 1430	for U.S.A, Canada
Epson Stylus Photo 1500W	for Euro
Epson Stylus Photo 1430W	for Latin, Brazil, Mexico
EP-4004	for Japan