

1.5 station printer

# TM-U375/U375P

**Specification** 

STANDARD								
E								

# **SEIKO EPSON CORPORATION**

MATSUMOTO MINAMI PLANT 2070 KOTOBUKI KOAKA, MATSUMOTO-SHI, NAGANO, 399 JAPAN PHONE(0263)86-5353 FAX(0263)86-9923

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Rev.	Document	Date	WRT	СНК	APL	Sheet	Sheet Rev. Sheet Rev. Sheet Re				Rev.
А	ENACTMENT		Y.Fukuda	T.Akiyama	T.Endo	I	С	15-2	С	33-2	С
В	CHANGE		K.Aruga	T.Akiyama	T.Endo	11	С	15-3	С	33-3	D
С	CHANGE		I.Koshimizu	K.Ebina	Y.Inoda	111	С	15-4	С	34	С
D	CHANGE		Kawakami	Asai	ltoh	IV	С	15-5	С	35	С
Е	CHANGE					V	С	15-6	С	36	Е
						VI	С	16	С	37	С
								17-1	С	38	С
						1	С	17-2	С	39	С
						2	С	18	С	40	С
						3	С	19	С	41	С
						4	С	20	С	42	С
						5	С	21	С	43	С
						6	С	22	С	44	С
						7	С	23	С	45	С
						8	С	24	С	46	С
						9-1	С	25	С	48	С
						9-2	D	26	С	49	D
						10	Е	27	С	50	С
						11	С	28	С	51	С
						12	С	29	С	52	С
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						15-1	С	33-1	С	56	С
TITLE						Front Pa	rt				
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						64-2	D	87	С	App.7	С
						65	С	88	С	App.8	С
						66	С	89	С	App.9	С
						67	С	90	С	App.10	С
						68	С	91	С	App.11	С
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В	48	<b>LF</b> command Note: When printing includes more than 200 mm of pa $\rightarrow$ When printing on the paper roll includes paper feeding 8.5 mm (48/144 incluse)	per feeding g of more than	
	70	FSC L command	[Change]	-
	70	Note: When printing includes more than 200 mm of pa	per feeding	
		→ When printing on the paper roll includes paper fe than 8.5 mm (48/144 inches),	eding of more [Change]	
	83	ESC d command		
		Note: When printing includes more than 200 mm of pa	per feeding	
		$\rightarrow$ When printing on the paper roll includes paper feeding	g of more than	
6	A II	Sheet title	[Change]	
C	sheets	TM-11375 $\rightarrow$ TM-11375/11375P	[Change]	
	1		[Onange]	-
	I	Features	[Change]	
		<ul> <li>Both the RS-232 serial interface or the parallel interface selectable when the unit is shipped from the factory.</li> <li>(*1) For the RS-232 serial interface model only.</li> </ul>	ce should be [Addition] [Addition]	
	II to VI	Table of Contents	[Change]	
	10	1.10 Standards 1) EMI Standards	[Change]	
	14-2	2.1.3 Notes on resetting the printer using the interface $\rightarrow$ 6) Notes on resetting the printer using the interface	[Change]	
	15-1 to 15-6	2.1.2 IEEE 1284 bidirectional parallel interface	Addition1	-
	16	2.1.2 Notes on setting DIP switch 2-3 to on	,	-
		$\rightarrow$ 2.1.3 Notes on setting DIP switch 2-3 to on	[Change]	
	17-1	<ul><li>2.2.1 Interface connector</li><li>2) Parallel interface model</li><li>Figure 2.2.2</li></ul>	[Addition]	
	19	2.2.4 Customer display (DM-D) connector		-
	10	$\rightarrow$ 2.2.4 Customer display (DM-D) connector (RS-232 ir only )	nterface model [Change]	
	21	3.1 Commands ESC c 3 command	[Addition]	
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	33-2	$\rightarrow$ 3.3.4.1 RS-232 interface model	[Change]	4
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		This command is available only with a parallel interface n	nodel and is	
		ignored with a RS-232 serial interface model.	[Addition]	
	App. 21	APPENDIX L: Bidirectional Parallel Interface	[Addition]	
	to			
	App.38			
D	9-2	1.7 Printable Area () Slip paper (check paper) (70mm (2.76") SW		
			[Addition]	
	21	Commands (continued)	[Addition]	-
	21	ESC c 3		
		$\rightarrow$ Select paper sensor(s) to output paper-end signals	[Change]	
	33-3	3.3.4.2 Parallel interface model	[	
		Table 3.3.4 DIP Switch 1		
		1 Undefined		
		$\rightarrow$ 1 Automatic return Enabled Disabled	[Change]	
	37	3.7 Printing on Cut Sheets		
		Note: 1, never transmit the return home into cut sl	neet mode.	
		$\rightarrow$ 1, never turn the power off and open the cover	, cause a	
		paper jam.	[Change]	
	40	CR	[Change]	-
	43	[Description] Prints on line of not feed the paper.		
		$\rightarrow$ Serial interface printer		
		Parallel interface printer		
			[Change]	_
	64	ESC <		
	40	[Notes]		
E	10		[Change]	-
	36	3.6 Hexadecimal Dumping	[Dolotod]	
			[Deleted]	-
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# **General Description**

## Application

These specifications apply to TM-U375(RS-232 Serial Interface) printer and TM-U375P (Parallel interface) printer.

#### Features

The TM-U375/U375P is a high-performance POS printer which handles slip, validation, and journal printing in a single unit.

The printer has the following features:

- World's smallest multi-function 1.5 station printer.
- High-speed printing using logic seeking.
- Easy problem handling (e.g., paper jams or objects dropped into the printer) via a clamshell mechanism.
- Two cut sheet entrances: from above for validation paper and from the front for slip paper.
- Both journal and receipt printing with pressure-sensitive paper.
- Free-format printing in page mode.
- Various check printing pattern.
- Movable platen for easy paper insertion.
- Paper load switch for easy paper roll loading.
- Control capability for two drawers.
- $\hfill\square$  Selectable character size (7  $\times$  9 font or 5  $\times$  9 font).
- □ Command protocol based on the ESC/POS<sup>™</sup> standard.
- Automatic Status Back (ASB) function to automatically send printer status changes.
- Epson customer display connection function (\*1).
- Epson intelligent module connection function (\*1).
- Both the RS-232 serial interface or the parallel interface should be selectable when the unit is shipped from the factory.
  - (\*1) For the RS-232 serial interface model only.

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	ESC * m nL nн [d] nL + 256 × nH	62
	ESC – <i>n</i>	63
	ESC 2	63
	ESC 3 n	64
	ESC <	64
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	ESC D [n]k NUL	68
	ESC E n	69

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ESC J n	70
ESC L	71
ESC R n	72
ESC T n	73
ESC U n	74
ESC V n	75
ESC W xL xH dyH	76
ESC \ nL nH	77
ESC a n	
ESC c 0 <i>n</i>	79
ESC c 1 <i>n</i>	80-1
ESC c 3 <i>n</i>	80-2
ESC c 4 <i>n</i>	81
ESC c 5 <i>n</i>	82
ESC d n	83
ESC f <i>t1 t2</i>	83
ESC p <i>m t1 t2</i>	
ESC q	85
ESC t n	
ESC u n	
ESC v	
ESC { <i>n</i>	
GS * <i>x y</i> [ <i>d</i> ] <i>x</i> × <i>y</i> × 8	
GS / <i>m</i>	
GS E <i>n</i>	91
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# **1. GENERAL SPECIFICATIONS**

# 1.1 Printing Specifications

1) Printing method:	Impact dot matrix
1) Printing method:	Serial impact dot matrix
2) Head wire layout:	Serial type 9-pin (wire pitch: 1/72 inch)
<ol><li>Printing direction:</li></ol>	Bidirectional, minimum distance printing (logic seeking)
4) Printing speed:	Approximately 3.5 LPS (40 columns,16 CPI, continuous printing)
	Approximately 5.4 LPS (20 columns,16 CPI, continuous printing)
	(LPS: Lines Per Second; CPI: Characters Per Inch)
NOTE: During excessive use r	printing stops to protect the print head. In this case, the actual

NOTE: During excessive use, printing stops to protect the print head. In this case, the actual printing speed may be slower than that listed above.

5) Characters per line:	See Table 1.2.1.
6) Characters per inch:	See Table 1.2.1.
7) Print duty:	See Appendix A.

# **1.2 Character Specifications**

1) Number of characters:	Alphanumeric : Extended graphics: International:	95 128 × 8 (tables) 32	(space pages included)
2) Character structure:	$7 \times 9$ (total horizontal $5 \times 9$ (total horizontal	l dot positions: l dot positions:	400 half dots) 200 dots)
3) Character size:	See Table 1.2.1		

Table 1.2.1	Character Size,	, Characters Per	Line, Characters	s per Inch
-------------	-----------------	------------------	------------------	------------

Character Structure		Character Size	Character	Charactere	Charactere	
Horizontal × Vertical Character Type		W × H Dot Spacing		Per Line (CPL)	Per Inch (CPI)	
70(1)	Alphanumeric/ international	1.24 × 3.1 mm (.049" × .122")	3 half dots	40	16	
7 × 9 (*)	Graphics	1.72 × 3.1 mm (.068 × .122")	0	40	16	
	Alphanumeric/ international	1.56 × 3.1 mm (.063" × .122")	1	33	13.3	
5×9	Graphics	1.88 × 3.1 mm (.074 × .122")	0	33	13.3	

(\*) Default font is  $7 \times 9$ .

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*1:	Character	pitch
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Figure 1.2.2 5 × 9 Font Sample

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# 1.3 Ribbon Cassettes

1) Exclusive ribbon cassettes

Part Number	Color	Ribbon Life (*)
ERC-38 (P)	Purple	4 million characters (25°C (77°F), continuous printing)
ERC-38 (B)	Black	3 million characters (25°C (77°F), continuous printing)

 $(\ast)$  Ribbon life is based on the following conditions:

Character font:	$7 \times 9$ (with descenders)
Print pattern:	ASCII 96-character rolling pattern
	See Figure A-1 in Appendix A for an example.
	(25°C (77°F), at 24 V, energizing pulse width for standard mode)

2) Ribbon cassette overall dimensions: See Figure 1.3.1

(All the numeric values are typical.)



Figure 1.3.1 ERC-38 (P)/(B) Overall Dimensions

NOTE: Use of any ribbon cassettes other than those approved by Epson may damage the printer and will void the warranty.

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# 1.4 Paper Roll Supply Device

1) Feeding method:	Paper roll drop-in loading
2) Near-end sensor:	Installed on the paper supply device and adjusted by the user.
a) Detection mechanism:	Microswitch
b)Paper roll inside diameter:	10 mm (.39") or more (Recommended inside diameter: 12 mm (.47") or more)
c) Near-end adjustment:	Adjustable slider (See Appendix B for details.)

## 1.5 Journal Take-up Device

Journal paper is taken up automatically by driving the paper feed motor.

1.6 Paper Specifications			
1) Paper feed method:	Friction	n feed	
2) Paper feed pitch:	1/6 inc Progra	h (default) mmable in t	units of 1/144 inch by using commands.
3) Paper feed speed:	Approx (IPS: Ir	imately 2.6 Inches Per S	7 IPS (16 LPS) (continuous paper feeding) Second; LPS: Lines Per Second)
4) Paper size			
a)Paper roll			
Paper width:	$76\pm0.$	5 mm (2.99	)" ± .02")
Outside diameter:			
Single-ply paper:	Journal paper only:	$\varnothing$ 60 + 0 (with take-	mm (2.36") or less ·up flange diameter of $\oslash$ 75 mm (2.95"))
	Receipt paper only:	Ø 83 + 0 r	mm (3.27") or less
2-ply paper:	Ø 83 + 0 mm (3.27	") or less (lo	ower paper must be taken up)
Inside diameter:	10 mm (.39") or mo	ore	
<ol> <li>Normal paper</li> </ol>			
Paper thickness:	Single-	ply paper:	0.06 to 0.085 mm (.0024 to .0033")
② Multi-ply paper			
Paper thickness:	0.05 to Total th	0.08 mm (. hickness: 0.	0020 to .0031") per sheet 16 mm (.0063") or less
Maximum number	of sheets: 2 (1 ori	ginal + 1 cc	рру)
Recommended pap	per: Mitsubi	shi Paper N	/ills Co., no-carbon paper (blue)
Uj Lo	oper sheet: N40Hi ower sheet: N60 (th	(thickness: hickness: 0.	0.06 mm (.0023"), weight: 47.2 g/m <sup>2</sup> ) 08 mm (.0031"), weight: 68.0 g/m <sup>2</sup> )

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b)Cut sheets:	Slip/validation p (Use cut sheet v	aper with a paper roll loaded.)
Paper types:	Normal, pressu	re sensitive, and carbon copy paper
Paper size (W $\times$	L):	
① Slip paper:	(*) 70 to 182 mm $ imes$ (maximum 58 lines	160 to 257 mm (2.76 to 7.17" × 6.30 to 10.12") a at 4.23 mm (.17") pitch)
② Validation pape	er: 135 to 182 mm × 7 (maximum 16 lines	0 to 257 mm (5.31 to 7.17" × 2.76 to 10.12") at 4.23 mm (.17") pitch)
(*) When using s shown in Sec	lip paper that is 70 to 85 m tion 1.7-4).	nm (2.76 to 3.35") wide, observe the printable area
Single-ply pape	er (without copy paper)	
Thickness:	0.09 to 0.12 mm	n (.0035 to .0047")
Copy paper		
Thickness:	Backing paper:	0.07 to 0.12 mm (.0028 to .0047")
	Copy and original paper:	0.04 to 0.07 mm (.0016 to .0028")
	Carbon copy paper:	Approximately 0.035 mm (.00138")
	Total thickness:	0.09 to 0.31 mm (.0035 to .012") (roll paper thickness included)
Example)	Original + 2-ply copy	
	Original paper:	0.04 mm (.0016")
	Carbon copy paper:	0.07 mm (.0028") (0.035 mm (.0014") $\times$ 2 sheets)
	Copy paper:	0.04 mm (.0016")
	Backing paper:	0.07 mm (.0028")
	Roll paper:	0.08 mm (.0031")
	Total thickness:	0.30 mm (.0118")

Copying capability:

As copying capability is influenced by the ambient temperature, printing must be performed under the conditions described in Table 1.6.1.

 Table 1.6.1
 Relationship between Ambient Temperature and Number of Copies

Number of Copies	Ambient Temperature
Original + 2-ply copy	10° to 40°C (50° to 104°F)
Original + 1-ply copy	5° to 40°C (41° to 104°F)

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- 5) Notes on using cut sheets
  - Use cut sheets with a paper roll loaded.
  - Use cut sheets that are flat, without curls, folds, warps, or wrinkles, especially at the paper end. Otherwise, the paper may become ink stained or the ribbon may get caught in the printer mechanism. Particularly, slip paper with curls at the paper end may cause character misalignment within an area of about 17 mm (.67") from the paper edge.
  - There must be no glue on the bottom edge of slip paper. It is desirable for the glue to be on the top edge. Choose slip paper carefully when the glue is on the right or left edge, since paper feeding and insertion are affected by gluing conditions (e.g., glue quality, method, and length) and glue location (refer to Figure 1.6.1). Be especially careful when slip paper is wide and has the glue on the right or left edge, since meandering may occur.
  - Cut sheets with holes (e.g., sprocket holes) within the areas shown in Figures 1.6.2 and 1.6.3 must not be used. Otherwise, the paper cannot be detected by the paper sensor. Translucent paper must not be used.
  - Use of multi-ply copy paper with a thick middle sheet may decrease copying capability.
  - Printing noise may change depending on paper thickness. Noise may increase when thick singleply paper is used.



Figure 1.6.1 Glue Location of Slip Paper

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	Specification (STANDARD)	С	NEXT 7	SHEET 6

Validation paper



: Holes are prohibitec in this area.





Figure 1.6.3 Inserting Slip Paper

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	Specification (STANDARD)	С	NEXT 8	SHEET 7

#### 1.7 Printable Area

#### 1) Paper roll





- (\*1): Printable area when DIP switch 2-2 is ON, to select the setting in which the maximum number of characters per line, 42 and 35, available for the  $7 \times 9$  and  $5 \times 7$  fonts, respectively.
- (\*2): Paper feed amount after manual cutting is not included.

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	Specification (STANDARD)	С	NEXT 9	SHEET 8

3) Slip paper



Figure 1.7.3 Slip Paper

- NOTE: All the numeric values are typical. Take the margin into consideration when setting the printing position in the paper feed direction.
- 4) Slip paper (check paper) (70 mm (2.76")  $\leq$  W (paper width)  $\leq$  85 mm (3.35")) Printable area X = W - 22 (mm)



Figure 1.7.4 Slip Paper (Check Paper)

(\*3) If slip paper with curls at the paper end is used, character misalignment may occur within an area of about 17 mm (.67") from the paper edge.

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	Specification (STANDARD)	С	NEXT 9-2	SHEET 9-1

NOTE: 1. When using a cut sheet that is narrower than the carriage movement range, never turn the power off and open the cover, transmit the return home command (**ESC**<) or reset the machine with the interface after putting the printer into cut sheet mode and inserting a cut sheet.

Allowing the carriage to move from the home position across the edge of the paper may cause a paper jam.

- 2. The cut sheet waiting state can be canceled by **DLE ENQ 3** command.
- 3. Use the ASB function to correctly determine the paper state. (See Appendix I. Example Print Control for Cut Sheet.)

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	Specification (STANDARD)	D	NEXT 9-3	SHEET 9-2

#### 1.8 Receive Buffer

Selectable as 40 bytes or 4K bytes by a DIP switch (See Section 3.3.4, DIP switches.)

#### 1.9 Electrical Specifications

- 1) Power supply: + 24 VDC  $\pm$  10%
- 2) Power consumption (at 24 V, excluding drawer kick-out) Operating: Approximately 1.4 A (mean
  - Approximately 1.4 A (mean) Approximately 5.5 A (peak)
  - Standby: Approximately 0.2 A (mean)

# 1.10 Standards

- 1) EMI standards (measured using the EPSON power supply unit PS-150)
  - Japan VCCI: Class 1
  - U.S.A. FCC: Class A

Europe – CE marking: EN55022

EN50082-1 EN45501

# 2) Safety standards

UL1950-2TH-D3 (Recognized component) CSA950-D3 (Recognized component) EN60950 (IEC950 2TH)

# 1.11 Electrostatic Voltage (measured based on the IEC801-2 test conditions)

Air discharge:	8 kV clear level
Contact discharge:	4 kV clear level

# 1.12 Reliability

#### 1) Life

Mechanism:

7,500,000 lines (only when printing on paper roll)

3,000,000 lines (only when printing on cut sheet)

When printing both on paper roll and on cut sheet, total printing lines are 7.5 million lines.

# Print head: 150 million characters

End of life id defined as the point at which the printer reaches the beginning of the Wearout Period.



# 2) MTBF

180,000 hours

Failure is defined as Random Failure occuring at the time of the Random Failure Period.

- 3) MCBF
  - 18,000,000 lines (only when printing on paper roll)

This is an average failure interval based on failures relating to wearout and random failures up to the life of 7.5 million lines.

7,000,000 lines (only when printing on cut sheet)

This is an average failure interval based on failures relating to wearout and random failures up to the life of 3 million lines.

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#### 1.13 Environmental Specifications

1) Temperature:

Operating: 5° to 40°C (41° to 104°F)

Storage: -10° to 50°C (14° to 122°F) (excluding paper and ribbon)

- 2) Humidity:
  - Operating:

20 to 80%RH

(see the range in Figure 1.13.1 below, for 30°C (86°F) and above, without condensation)

Storage:

20 to 90 %RH (excluding paper and ribbon, without condensation)





3) Vibration resistance: When packed:

Frequency:	5 to 55 Hz
Acceleration:	2 G
Sweep:	10 minutes (half circle)
Time:	1 hour
Directions:	X, Y, and Z

No external or internal damage should be found after the vibration test, and the printer should operate normally.

4) Impact resistance:

When packed:	Package: Height:	Epson standard package 60 cm (23.62")
	Directions:	1 corner, 3 edges, and 6 surfaces

No external or internal damage should be found after the drop test, and the printer should operate normally.

When unpacked:	Height:	5 cm (1.97")
	Directions:	Lift one edge and release it (for all 4 edges)

A non-operating printer should not be damaged after it is dropped (for all 4 edges).

#### 5) Acoustic noise

Operating:

Approximately 65 dB (Bystander position, receipt/journal printing)

#### 1.14 Installation

Install the printer horizontally.

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# 2. CONFIGURATION

#### 2.1 Interface

#### 2.1.1 RS-232 serial interface

1) Specifications

Data transmission:	Serial
Synchronization:	Asynchronous
Handshaking:	DTR/DSR or XON/XOFF control
Signal levels:	MARK = -3 to -15 V = logic '1' / OFF SPACE = +3 to +15 V = logic '0' / ON
Baud rate:	1200, 2400, 4800, 9600 bps
Data word length:	7 or 8 bits
Parity:	None, even, odd
Stop bits:	1 or more (See Note 2)
Connector:	D-SUB 25 (female)

NOTES: 1. The data word length, baud rate, and parity are set by DIP switches. (See Section 3.3.4.) 2. Data transmitted from the printer has 1 stop bit (fixed).

#### 2) On-line/off-line switching

The printer does not have an on-line/off-line switch. The printer automatically goes off-line at the following times:

1) The period from power-on (or initialization of the mechanism due to resetting through the interface) until when the printer is ready to receive data.

2) During the self-test.

3) When the cover is open.

- 4) During paper feeding using the paper feed switch.
- 5) When the printer stops due to a paper-end (if enabled by **ESC c 4**).
- 6) While the power is abnormal.

7) When an error has occurred.

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	Specification (STANDARD)	С	NEXT 13	SHEET 12

3) RS-232 Interface connector pin assignments and signal functions

Pin No.	Signal name	Signal Direction	Function				
1	FG		Frame ground				
2	TXD	Output	Transmit data				
3	RXD	Input	Receive data				
4	RTS	Output	When DIP switch 2-1 is off Same as DTR signal (same as	nin 20)			
	i ti o	Output	When DIP switch 2-1 is on:	pii 20)			
			Logical multiplication of the DTR signals of the customer printer. (The RTS signal becomes SPACE when both the SPACE.)	r display a e DTR sig	and the nals are		
6	DSR	Input	Indicates whether the host can receive data.				
			SPACE indicates that the host can receive data, and MARK	indicates	that the		
			host cannot receive data. When DTR/DSR control is selecte	d, the prir	nter		
			transmits data after checking this signal (except when data i	s sent by	DLE EOI,		
			signal.	s not cheo	CK THIS		
			Changing the DIP switch setting enables this signal to be us	ed as a re	eset signal		
			for the printer (see Section 3.3.4). The printer is reset when	n the sign	al remains		
			MARK for 1 ms or more.				
7	SG		Signal ground				
20	DTR	Output	1) When DTR/DSR control is selected, this signal indicates	whether t	he printer		
			IS BUSY.				
			indicates that the printer is RUSY				
			DIP switch 2-3 switches conditions for BUSY. (See 3.3.4)				
			The BUSY (MARK) condition is changed using DIP switch 2-3 as follows:				
					2.2 status		
			Printer Status	ON ON	OFF		
		Off 1) Th	e period from power-on (or initialization of the mechanism due to	BUSY	BUSY		
		- re	setting through the interface) until the printer is ready to receive				
		line da	ta.	DUCY	DUCV		
		2) D(	hen the cover is open		BUSY		
		4) Du	uring paper feeding using the paper feed switch.		BUSY		
		5) W	hen the printer stops due to a paper-end (ESC c 4).		BUSY		
		6) W	hile the power is abnormal		BUSY		
		7) Du	uring an error condition.		BUSY		
		8) W	Vhen the receive buffer is full.(*1) BUSY BUSY				
			is properly connected and is ready to receive data.				
			SPACE indicates that the printer is properly connected a	nd is read	y to		
			periods:		/ing		
			<ul> <li>From power-on until the printer is ready to receive data.</li> </ul>				
			During the self-test.				
25	INIT	Output	Changing the DIP switch setting enables this signal to be us	ed as a re	eset signal		
			for the printer. The printer is reset when the signal remains	SPACE f	for 1 ms or		
			more.				

 Table 2.1.1
 TM-U375 Printer States and Signals

\*1 • The period from when the remaining space in the receive buffer drops to 10 bytes until it increases to 20 bytes is called the "buffer full state".

Data received when the remaining space in the receive buffer is zero bytes is ignored.

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LFSUN	Specification (STANDARD)	С	NEXT 14-1	SHEET 13

#### 4) XON/OFF transmit timing

When XON/OFF control is selected, the printer transmits XON or XOFF signals as follows. Transmit timing depends on the setting of DIP switch 2-3. (See Section 3.3.4.)

	Printor Statuc	DIP Switch 2-3 Status		
		ON	OFF	
[XON Transmission]	1) When the printer first becomes on-line after power-on or after resetting through the interface.	Transmission	Transmission	
	<ol> <li>When the receive buffer is released from the buffer- full state.</li> </ol>	Transmission	Transmission	
	<ol> <li>When the printer status changes from off-line to on- line.</li> </ol>		Transmission	
	<ol> <li>When the printer recovers from an error through a command.</li> </ol>		Transmission	
[XOFF	5) When the receive buffer becomes full.	Transmission	Transmission	
Transmission]	<ol> <li>When the printer status changes from on-line to off- line.</li> </ol>		Transmission	

Table 2.1.2	XON/XOFF Transmit Timing	
-------------	--------------------------	--

NOTES: • The XON code is <11> H and the XOFF code is <13> H.

- In case 3), XON is not transmitted when the receive buffer is full.

- In case 6), XOFF is not transmitted when the receive buffer is full.

5) Example serial interface connection

(DTE: Data Terminal Equipment; DCE: Data Circuit Terminating Equipment)

Host (DTE ex. 8251)	Printer
TXD	RXD
DSR	DTR
CTS	RTS
RXD	TXD
DTR	DSR
FG	FG
SG	SG

When connecting the printer to a DCE, set the handshaking so that the transmit data can be received.

- Transmit data to the printer after turning on the power and initializing the printer.

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EFSUN	Specification (STANDARD)	С	NEXT 14-2	SHEET 14-1

6) Notes on resetting the printer using the interface

The printer can be reset through the interface (pins 6 or 25) by changing the DIP switch settings accordingly (see Table 3.3.3).

Pin Number	DIP switch	Reset Condition		
Pin 6 (DSR)	DSW 2-7: on	MARK level voltage input		
Pin 25 (INIT)	DSW 2-8: on	SPACE or TTL-HIGH level input		

Table 2.1.3 Switching of the Reset Condition

To reset the printer, the conditions given below must be satisfied:

DC characteristics

Item	Symbol	Pin 6 (DSR)	Pin 25 (INIT)
Input HIGH level voltage	Vih	+3 to +15 V	+2 V to +15 V
Input LOW level voltage	VIL	-15 to -3V	-15 V to +0.8 V
Input HIGH level current	Ін	5 mA (maximum)	1 mA (maximum)
Input LOW level current	lı∟	-5.3 mA (maximum)	-2 mA (maximum)
Input Impedance	RIN	3 K $\Omega$ (minimum)	

**Table 2.1.4 Reset DC Characteristics** 

AC characteristics

Reset minimum pulse width: TRS 1 msec (minimum)

When Pin 6 (DSR) is used (DIP switch 2-7 is on):



INIT \_\_\_\_\_ 1

Figure 2.1.2 Interface Reset Signal (INIT)

- NOTES: 1. Correct printer operation is not guaranteed unless the signals meet the above stated conditions. The above conditions must also be met when TTL signals are used to drive the DSR and INIT reset pins. Although a signal is input to pin 6 (DSR) at the TTL level, according to the DC characteristics described above, the operation is not guaranteed and pin 6 cannot be controlled.
  - 2. When pin 6 (DSR) and pin 25 (INIT) are open, the printer is operating.

EDSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
LFSUN	Specification (STANDARD)	С	NEXT 15-1	SHEET 14-2

## 2.1.2 IEEE 1284 bidirectional parallel interface

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## 2.1.2.1 Compatibility Mode (Data transmission from Host to Printer: based on Centronics)

1) Description

The Compatibility Mode features compatibility with the Centronics interface popular among the existing PCs.

2) Specifications

Data transmission:	8-bit Parallel
Synchronization:	Externally supplied nStrobe signals
Handshaking:	nAck and Busy signals
Signal levels:	TTL compatible
Connector:	57RE-40360 (DDK) or equivalent (1284 Type B)

3) Switching between on-line and off-line

The printer is not equipped with any on-line/off-line switch. The printer is placed into off-line status in either of the followings:

- When the power is turned on or until the printer becomes ready for data transmission after it is initialized by the reset signal (nInit) from the interface.
- □ In the process of self-test.
- While the cover is set open.
- In the process of paper feeding using the paper feed switch
- When the printer runs out of paper, thereby suspending the printing operation in progress (in case when empty paper supply is detected by the paper roll near end detector with a printing halt feature set enabled due to paper shortage by ESC C 4).
- While the power is abnormal.
- □ When an error has occurred.

#### 2.1.2.2 Reverse Mode (data transmission from Printer to Host)

The STATUS data transmission from the printer to the host is proceeded in the Nibble or Byte mode.

Description

This mode allows data transmission from the asynchronous printer under the control of the host. Data transmissions in the Nibble Mode are made via the existing control lines in units of four bits (Nibble). In the Byte Mode, data transmissions are proceeded by making the eight-bits data lines bidirectional.

The both modes fail to be proceeded concurrently with the Compatibility Mode, thereby causing half duplex transmission.

For detail description, refer to APPENDIX L.

EDGON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
EFSUN	Specification (STANDARD)	С	NEXT 15-2	SHEET 15-1

Pin	Source	Compatibility Mode	Nibble Mode	Byte Mode
1	Host	nStrobe	HostClk	HostClk
2	Host/Ptr	Data0(LSB)	Data0(LSB)	Data0(LSB)
3	Host/Ptr	Data1	Data1	Data1
4	Host/Ptr	Data2	Data2	Data2
5	Host/Ptr	Data3	Data3	Data3
6	Host/Ptr	Data4	Data4	Data4
7	Host/Ptr	Data5	Data5	Data5
8	Host/Ptr	Data6	Data6	Data6
9	Host/Ptr	Data7(MSB)	Data7(MSB)	Data7(MSB)
10	Printer	nAck	PtrClk	PtrClk
11	Printer	Busy	PtrBusy/Data3, 7	PtrBusy
12	Printer	PError	AckDataReq/Data2, 6	AckDataReq
13	Printer	Select	Xflag/Data1, 5	Xflag
14	Host	nAutoFd	HostBusy	HostBusy
15		NC	ND	ND
16		GND	GND	GND
17		FG	FG	FG
18	Printer	Logic-H	Logic-H	Logic-H
19		GND	GND	GND
20		GND	GND	GND
21		GND	GND	GND
22		GND	GND	GND
23		GND	GND	GND
24		GND	GND	GND
25		GND	GND	GND
26		GND	GND	GND
27		GND	GND	GND
28		GND	GND	GND
29		GND	GND	GND
30		GND	GND	GND
31	Host	nInit	nInit	nInit
32	Printer	nFault	nDataAvail/Data0, 4	nDataAvail
33		GND	ND	ND
34	Printer	DK_STATUS	ND	ND
35	Printer	+5V	ND	ND
36	Host	nSelectIn	1284-Active	1284-Active

2.1.2.3 Interface pin assignments for each mode

\*NC: No Connect, ND: Not Defined

EDGON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
EFSUN	Specification (STANDARD)	С	NEXT 15-3	SHEET 15-2

- NOTES: 1. A prefix "n" to signal names refers to "L" active signals. To the host provided with none of the signal lines listed above, both-way communication fails.
  - 2. For interfacing, signal lines shall use twisted pair cables with the return sides connected to signal ground level.
  - 3. Interfacing conditions shall be all based on the TTL level to meet the characteristics described below. In addition, both rise time and fall time of each signal shall be  $0.5\mu s$  or less.
  - 4. Data transmission shall not ignore the signal nAck or Busy. An attempt to transmit data with either signal, nAck or Busy, ignored can cause lost data.
  - 5. Interface cables shall be as minimum required short in length as possible.

# 2.1.2.4 Electrical characteristics

## DC Characteristics (Except Logic-H, + 5 V signals)

Characteristics	Symbol	Specifications		Conditions	
Characteristics	Symbol	Min	Max	Conditions	
Output HIGH voltage	Vон	*2.4 V	5.5 V	*IOH=0.32mA	
Output LOW voltage	Vol	-0.5 V	*0.4 V	*IOL=-12mA	
Output HIGH current	Іон	0.32 mA	-	VOH=0.32V	
Output LOW current	IOL	-12 mA	-	VOL=0.4V	
Input HIGH voltage	Viн	2.0 V	-		
Input LOW voltage	VIL	-	0.8 V		
Input HIGH current	Viн	-	-0.32 mA	VIH=2.0V	
Input LOW current	VIL	-	12 mA	VIL=0.8V	

#### Logic-H Signal Sender Characteristics

Characteristics	Symbol	Specifications		Conditiona	
Characteristics	Symbol	Min	Max	Conditions	
Output HIGH voltage	Vон	3.0 V	5.5 V		
Output LOW voltage	Vol	-	2.0 V	While the power is OFF	

EDSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
EFSUN	Specification (STANDARD)	С	NEXT 15-4	SHEET 15-3

	-				
Characteristics	Symbol	Specifications		Conditions	
Characteristics	Symbol	Min	Max	Conditions	
Output HIGH voltage	Vон	*2.4 V	5.5 V	*IOH=0.32mA	
Output LOW voltage	Vol	-	- **	While the power is OFF	
Output HIGH current	Іон	-	0.32 mA	VOH=2.4V	
Output LOW current	IOL	- **	-	While the power is OFF	

+5 V Signal Sender Characteristics

\*\* No guarantee is offered to VoL and IOL while the power is OFF.

# 2.1.2.5 Data receiving timing (Compatibility Mode)

Data Data r	1	$\times$	$\square$	Data n+1
nStrobe	Hold-1	→ 2→	[	
Busy	y →	Peripheral Bus	y	
nAck —	€tReply	+tACK +	_tnBUSYtNext	*
Characteristics	Symbol	Specifi Min [ns]	cations Max [ns]	
Data Hold Time (host)	tHold-1		500	
Data Hold Time (printer)	tHold-2			
Data Setup Time	tSetup		500	
STROBE Pulse Width	tSTB		500	
READY Cycle Idle Time	tReady			
BUSY Output Delay Time	tBUSY	0	500	
Data Processing Time	tReply	0	œ	
ACKNLG Pulse Width	tACK	500	10µs	
BUSY Release Time	tBUSY	0	œ	
ACK Cycle Idle Time	tNEXT		0	

\* The printer latches data at a falling edge of nStrobe.

EDSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
LFSUN	Specification (STANDARD)	С	NEXT 15-5	SHEET 15-4

#### 2.1.2.6 Notes on resetting the printer through the interface

The printer reset is available through the interface nInit signal (#31 pin) by changing the DIP switch setting. (Refer to Table 3.3.5 DIP Switch 2.)

Signal Line	DIP Switch	Reset Condition
#31 Pin (nInit)	DSW 2-8: ON	TTL-LOW level input

Table 2.1.5	DIP Switch Setting for Printer Reset
-------------	--------------------------------------

The printer reset through the nInit signal is only available with the SelectIn(1284-Active) signal at LOW. To enable the printer reset, the following characteristics shall be satisfied.

DC characterisitic : TTL level

AC characteristics : See the timing chart below.



Minimum reset pulse width TR: 50µs (min)

EDSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
LFSUN	Specification (STANDARD)	С	NEXT 15-6	SHEET 15-5

#### 2.1.2.7 Reception of status from the printer through the bidirectional parallel interface

In the bidirectional parallel interface specifications, the printer status transmission is available by using the both-way communication facility in the Nibble/Byte Modes in accordance with the IEEE 1284. In this case, different from in the RS-232 serial interface specifications, the real-time interruptions from the printer to the host are disabled and thus precautions must be taken to the followings.

- 1) Allowable capacity of the printer internal buffer is 100 bytes (except ASB status). The status signals exceeding this capacity will be discarded. To prevent possible loss of status, the host shall be ready for data acception (Reverse Mode).
- 2) When ASB is used, the host is preferably in the wait state for data acception (Reverse Idle Mode). When this state is not available, the host shall enter the Reverse Mode to always monitor the presence of data.
- 3) When ASB is used, preference shall be given to the ASB status for transmission over the other status signals. Any accumulated ASB status signals left for transmission from the last to the newest ASB status transmission shall be transmitted together at a time as one ASB status showing the presence of change, followed by the latest ASB status.

Example: In the normal (wait) state, the ASB status is configured as follows.

First Status	First Status Status Status		Fourth Status
0000 0000	0000 0000	0000 0000	0000 0000

When a sequence of operations are proceeded, near end detection cover open cover closed, the following pieces of data are accumulated.

	First Status	Second Status	Third Status	Fourth Status	
1	0000 0000	0000 0000	0000 0011	0000 0000	Near end detection
2	0010 1000	0000 0000	0000 0011	0000 0000	Cover open
3	0000 0000	0000 0000	0000 0011	0000 0000	Cover closed

When the ASB status is received following this, a total of eight (8) bytes of ASB will be transmitted as follows.

	First Status	Second Status	Third Status	Fourth Status
Accumulated ASB (1+2+3)	0100 1000	0000 0000	0010 0000	0000 0000
+	First Status	Second Status	Third Status	Fourth Status
The latest ASB (3)	0000 0000	0000 0000	0010 0000	0000 0000

EPSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	С	NEXT 16	SHEET 15-6

## 2.1.3 Notes on setting DIP switch 2-3 to on

- 1) The printer mechanism stops but does not become BUSY in the following cases:
  - <sup>D</sup> When an error occurs.
  - When the cover is open.
  - <sup>□</sup> When the printer stops printing due to a paper-end.
  - <sup>D</sup> When paper is fed using the feed button.
- 2) When handshaking with the printer while using this switch setting, make sure to monitor the printer with the **GS a** command and the ASB function.

With this switch setting, the default value of the **GS a** command n = 2. This automatically transmits the printer status, depending on on-line/off-line changes.

- 3) When using the **DLE EOT** or **DLE ENQ** command, make sure that the receive buffer does not become full.
  - Notes on using a host that cannot transmit data when the printer is BUSY:

If an error occurs when the receive buffer is full and the printer is BUSY, the **DLE EOT** and **DLE ENQ** commands cannot be used.

• Notes on using a host that can transmit data when the printer is BUSY:

If a **DLE EOT** or **DLE ENQ** command is used while sending bit-image data, and the receive buffer-full state is encountered during transmission of the data, the **DLE EOT** or **DLE ENQ** is processed as bit-image data.

In addition, the data transmitted during the receive buffer-full state may be lost.

Example of use:

Set the receive buffer to 4K bytes, and check the status with **ESC v** or **ESC u** for each line of printing transmitted. Make sure that the data for printing each line does not cause the printer to enter the receive buffer-full state.

EPSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	С	NEXT 17-1	SHEET 16

# 2.2 Connectors

## 2.2.1 Interface connector

See Section 2.1, Interface.

1) RS-232 interface model



Figure 2.2.1 Connector Panel

2) Parallel interface model



# 2.2.2 Power supply connector

This connector is used to connect the printer to an external power source.

1) Pin assignments:	See Table 2.2.1
2) Model (printer side):	Hosiden TCS7960-532010 (or equivalent)
3) Model (host side):	Hosiden TCP8927-631100 (or equivalent)
	Hosiden TCP8927-531100 (or equivalent)

# Table 2.2.1 Power Supply Connector Pin Assignments

Pin No.	Function
1	+ 24 V
2	GND
3	NC
SHELL	FG

NOTE: Be sure to ground the frame ground (FG) screw on the board at the bottom of the unit

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# 2.2.3 Drawer kick-out connector (modular connector)

The signal specified by the **ESC p** command is output to this connector. The host can confirm the input signal state by using the **DLE EOT**, **ESC u**, **GS a**, and **GS r** commands.

See Appendix C for information on using the drawer kick-out connector. 1) Pin assignments

		•
Pin Number	Signal name	Direction
1	Frame GND	
2	Drawer Kick-out driver signal 1	Output
3	Drawer open/close signal	Input
4	+24V	
5	Drawer kick-out drive signal 2	Output
6	Signal GND	



|--|

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2) Drawer kick-out drive signal

Output signal: Voltage: Approximately 24 V Current: 1 A or less

CAUTION: To avoid an overcurrent, the resistance of the drawer kick-out solenoid must be 24  $\Omega$  or more.

Output waveform: Outputs the waveforms in Figure 2.2.3 to points A and B in Figure 2.2.4. (The **ESC p** command specifies ON time *t1* and OFF time *t2*.)



Figure 2.2.3 Drawer Kick-out Drive Signal Output Waveform

3) Drawer open/close signal

Input signal level (connector pin 3): "L" = 0 - 0.8 V, "H" = 2 - 5 V



### Figure 2.2.4 Circuitry

- NOTES: 1. Use a shielded drawer connection cable.
  - 2. Two driver transistors cannot be driven simultaneously.
  - 3. The drawer drive duty must be as shown below:

ON time

(ON time + OFF time)  $\leq 0.2$ 

- 4. Be sure to use the printer power supply (connector pin 4) for the drawer power source.
- 5. The resistance of the drawer kick-out solenoid must not be less than that specified ( $24\Omega$ ). Otherwise, an overcurrent could damage the solenoid.

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# 2.2.4 Customer display (DM-D) connector (RS-232 interface model only)

This connector is used for the Epson customer display (DM-D series). Never connect any other customer displays.

See the DM specifications for usage information.

Pin Number	Signal name	Direction
1	NC	
2	NC	
3	TXD	Output
4	DTR	Output
5	DSR	Input
6	SG	
7	+24V	
8	PG	





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# 3. FUNCTIONS

#### 3.1 Commands

	Command Classification		Standard	Page	GS P	
Command	Name	Execution	Setting	Mode	Mode	Effect
НТ	Horizontal tab	*	Command	*	*	
LF	Line feed	*		*	*	
FF	Eject cut sheet and return to standard mode	*		*	*	
CR	Carriage return	*		*	*	
DLE EOT	Real-time transmission of status	*		*	*	
DLE ENQ	Real-time request to printer	*		*	*	
CAN	Cancel print data in page mode	*		Disabled	*	
ESC SP	Set right-side character spacing		*	*	*	*
ESC !	Select print mode(s)		*	*	*	
ESC \$	Set absolute print position	*		*	*	*
ESC %	Select/cancel user-defined character set		*	*	*	
ESC &	Define user-defined characters		*	*	*	
ESC *	Select bit-image mode	*		*	*	
ESC –	Turn underline mode on/off		*	*	*	
ESC 2	Select 1/6-inch line spacing		*	*	*	
ESC 3	Set line spacing		*	*	*	*
ESC <	Return home	*		*	*	
ESC =	Select peripheral device		*	*	*	
ESC ?	Cancel user-defined character		*		*	
ESC @	Initialize printer	*	*		*	
ESC C	Set slip paper eject length		*		*	
ESC D	Set horizontal tab positions		*		*	
ESC E	Turn emphasized mode on/off		*		*	
ESC G	Turn double-strike mode on/off		*		*	
ESC J	Feed paper	*			*	*
ESC L	Select page mode	*		(Line)	Disabled	
ESC R	Select an international character set		*	*	*	
ESC T	Select print direction in page mode		*	(Setting)	*	
ESC U	Turn unidirectional printing mode on/off		*	*	(AII)	
ESC V	Turn 90° clockwise rotation mode on/off	[	*	*	(Setting)	
ESC W	Set printing area in page mode	[	*	(Setting)	*	*
ESC \	Set relative print position	*	ľ	*	*	*

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	Specification (STANDARD)	С	NEXT 21	SHEET 20

#### Commands (continued)

		Command Classification		Standard	Page	GSP
Command	Name	Execution	Setting	Mode	Mode	Effect
		Command	Command			
ESC a	Select justification	*		(Line)	(Setting)	
ESC c 0	Select print paper(s)	*	*	(Line)	Disabled	
ESC c 1	Select paper(s) for setting		*	*	*	
ESC c 3	Select paper sensor(s) to output paper-end signals		*	*	*	
ESC c 4	Select paper sensor(s) to stop printing		*	*	*	
ESC c 5	Enable/disable panel buttons		*	*	*	
ESC d	Feed <i>n</i> lines	*		*	*	
ESC f	Set slip paper waiting time		*	*	*	
ESC p	Generate pulse	*		*	*	
ESC q	Release	*		*	*	
ESC t	Select character code table		*	*	*	
ESC u	Transmit peripheral device status	*		*	*	
ESC v	Transmit paper sensor status	*		*	*	
ESC {	Turn upside-down printing mode on/off		*	(Line)	(Setting)	
GS *	Define down-loaded bit image		*	*	*	
GS /	Print down-loaded bit image	*		(Data)	*	
GS E	Select head energizing time		*	(Line)	(All)	
GS I	Transmit printer ID	*		*	*	
GS L	Set left margin		*	(Line)	(Setting)	*
GS P	Set fundamental calculation pitch		*	*	*	
GS W	Set printable area width		*	(Line)		*
GS a	Enable/disable Automatic Status Back	*	*	*	*	
GS r	Transmit status		*	*	*	

*Execution command:* Executes printer functions. Not affect following data.

Setting command:Sets the printer's operational conditions. The printer status is retained by flag,<br/>and the command affects following data.Standard mode\*:Available

	(Line): (Data):	Available only at the beginning of the line. Available only when there is no data in the print buffer.
Page mode	*:	Available
	(Setting):	Only setting is possible.
	(All):	Available for all data when printing in page mode.
Disabled:	The para	meters are processed as the following data.

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# 3.2 Character Code Tables

#### Ш SP +1 Λł VI ... F ы ರ പ Ľ З р Ч θ Φ Ø ユ C ω Ψ С Р в., L L 19, 19: υ L -1 р T r -ģ ò ñ ĩŻ ഷ OI ა Г ≶ ☆ თ 囟 Æ :0 í٥ Ó Ġ ù :> :0 :⊃ ÷ ഷ ₩ 乱 ω С :Ħ Ś പ :๗ à ഷ Ch. ø :0 è ∢ ∢ L д σ S ى Þ ⋧ × Ν S ർ e م υ ъ Ю പ ч Ч Ч -1 E S ୟ **Р** Q S ы D ゝ ≥ N 7.3 ф C ធា G Ω ſщ Ξ К Σ z L 00 N ശ ω c ŝ ~ ດ $\mathbf{V}$ П -1 Λ <u>~</u>. S # θ % જ 1= CAN E XON ESC ŝ NUL ENO EOI ස -H c BIN Ĥ HEX ----ŝ ŝ ∞ ი ш ပ Р P F=-,

# 3.2.1 Page 0 (PC437: U.S.A. Standard Europe) (International character set:U.S.A.)

NOTE: The actual character patterns are different from those in the tables.

EPSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	С	NEXT 23	SHEET 22

# 3.2.2 Page 1 (Katakana)

	HEX	8	9	Α	В	С	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
Δ	0000	_	1	SP	-	タ	11	Ξ	×
U	0000	128	144	160	176	192	208	224	240
1	0001	-	т	0	ア	チ	4	F	円
1	0001	129	145	161	177	193	209	225	241
9	0010		-	Г	イ	ツ	X	+	年
2	0010	130	146	162	178	194	210	226	242
3	0011	<b>.</b>	F	J	ウ	テ	モ	1	月
5	0011	131	147	163	179	195	211	227	243
4	0100			、	<u>т</u>	<u>۲</u>	ヤ		日
r	0100	132	148	164	180	196	212	228	244
5	0101	■	-	·	オ	ナ	ユ		時
U	0101	133	149	165	181	197	213	229	245
ß	0110			ヲ	カ	<u> </u>	Э		分
v	0110	134	150	166	182	198	214	230	246
7	0111			ア	+	ヌ	ラ		秒
•	0111	135	151	167	183	199	215	231	247
8	1000		Г	1	ク	ネ	リ	<b>•</b>	<b>〒</b>
Ŭ	1000	136	152	168	184	200	216	232	248
0	1001	I	ר	ゥ	ケ	ノ	ル	♥	市
		137	153	169	185	201	217	233	249
A	1010		L	т	]	ハ	ν	<b> </b> ♦	K
		138	154	170	186	202	218	234	250
В	1011			オ	サ	12	п	<b>♣</b>	町
		139	155	171	187	203	219	235	251
С	1100		۲	7	シ	7		-	村
Ľ		140	156	172	188	204	220	236	252
D	1101		ר	ユ	ス	\^	ン	0	ㅅ
		141	157	173	189	205	221	237	253
E	1110			3	セ	本	``		│ <b>■</b>
Ē		142	158	174	190	206	222	238	254
F	1111	+ 		ッ	ソ	7	°	N	SP
		143	159	175	191	207	223	239	255

EDGON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
EFSUN	Specification (STANDARD)	С	NEXT 24	SHEET 23

# 3.2.3 Page 2 (PC850: Multilingual)

	HEX		8		9		A		B		С		D		E		F
HEX	BIN	1(	000	1(	001	1	010	1	011	1	100	1	101	1	110	1	111
٥	0000	Ç		É		á		***		L		ð		6		—	
V	0000		128		144		160		176		192		208		224		240
1	0001	ü		æ		í		*		⊥		Ð		ß		±	
1	0001		129		145		161		177		193		209		225		241
2	0010	é		Æ		ó		<b>*</b>		т		Ê		Ô			
	0010		130		146		162		178		194		210		226		242
3	0011	â	<b></b>	ô		ú	<b></b>		<b></b>	⊦⊦	<b></b>	Ë	<b></b>	Ò		34	
			131		147		163		179		195		211		227	_	243
4	0100	ä		ö		ñ		H	<u></u>	—		È		õ	<b></b>	9	
		-	132		148	~	164	Ļ	180	-	196		212	~	228	-	244
5	0101	a	100	Ó		Ν	105	Α	1.01	+		1		0		¦Β	
			133	~	149	_	105	-	181	~	197	2	213		229		245
6	0110	a	124	u	150	₫	100	A	100	a	100	T	014	μ		•	0.0
		_	134	~	190	-	100	2	182	r	189	Ŷ	214	-	230		240
7	0111	ç	125	u	151	⊻	167	A	100	A	100	T	015	P	0.01	د	0.47
		â	130	iż.	101	;	101	C	103	IL.	188	¥	210	ъ	231	0	241
8	1000	e	136	3	152	0	168	Ŭ	184	_	200	T	216	P	020		218
		Ä	100	ö	102	®	1100	1	1104	_	200	L	210	TT	202	••	640
8	1001		137	Ŭ	153		169	•	185		201		217	ľ	233		240
		è	1.01	Ü	1100	-	1100		1100	⊥	201	-	1011	n	1200		1230
A	1010		138	-	154		170	•	186		202	'	218	ľ	234		250
-		ï		ø	L	ł	1	7		T			1	Ù	1-0-	1	
R	1011		139	-	155	-	171	-	187	-	203	_	219		235		251
0	1100	î		£	<b>1</b>	ŧ		Ч	1	F	<b>I</b>		4	ý	-	3	
°C	1100		140		156	-	172		188	-	204	_	220	ľ	236		252
n	1101	ì	<b>k</b>	ø	L	i		¢	1	-	1	-	1	Ý	<b>I</b>	2	<u> </u>
ע	1101		141		157		173		189		205		221	ĺ	237		253
p	1110	Ä	•	X	•	<b>«</b>	•	¥	·	╋	L	Ì	1	-	<u> </u>		L
Ľ	1110		142		158		174		190	-	206		222		238		254
P	1111	Å	•	f		<b>»</b>		٦		¤	•		•	1	•	SP	<u> </u>
1			143		159		175		191		207		223		239		255

EDGON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
EFSUN	Specification (STANDARD)	С	NEXT 25	SHEET 24

# 3.2.4 Page 3 (PC860: Portuguese)

	HEX		8		9		A		B		С		D		E		F
HEX	BIN	1	000	10	001	1	010	1	011	1	100	1	101	1	110	1	111
Δ	0000	Ç		É		á				L		1		α			
v	0000		128		144		160		176		192		208		224		240
1	0001	ü		À		í		***		1		T		ß		±	
1	0001		129		145		161		177		193		209		225		241
2	0010	é		È		ó		<b>\$</b>		т		Т		Г		≥	
2	0010		130		146		162		178		194		210		226		242
3	0011	â		ô		ú	<b>_</b>			-	·	L		π		≤	
Ľ			131		147		163		179		195		211		227		243
4	0100	ã		õ		ñ	<u></u>	-	<u></u>	-		<b>L</b>	<b>.</b>	Σ		ר	
_			132		148	~	164		180		196		212		228	<b>.</b>	244
5	0101	à		Ò		Ň	1.0.5	-		+		Г		σ		iJ	
			133	-	149		165		181		197		213		229	<u>'</u>	245
6	0110	Α	104	U	150	₫	100	-1		╞		Г		μ		÷	
			134		150		166		182	_	198		214		230		246
7	0111	ç	105	u		Q	100	Г	100	F		Ŧ	015	τ		≈	
		-	135		151	<u> </u>	167		183		199		215	-	231	-	247
8	1000	е	100	I	150	ሪ	100	٦	101		000	+	010	Φ		ľ	
		-	130	~	192	~	108		184		200		216	-	232		248
9	1001	E	107	0	150	0	100	1	105	r	001	-	017	θ	000	•	0.0
		à	131	<del></del>	103		108		199		201		217		233		249
A	1010	е	120		154		170		100	-	000		010	2	0.24	•	050
		f	130	-	104	1	1170	<u> </u>	1100	_	202		210	8	234		290
В	1011	+	120	Ψ	155	2	171		197	r	202		210	0	0.25	~	051
		Ô	158	e	100	1	1111		101	L	203		218	-	230	n	201
C	1100		140	a	156	4	179	-	199	Г	204		220	Ű	0.26		250
		ì	140	ÌÌ	100	:	112		100	_	204		220	a	230	2	202
D	1101	1	141		157	•	172	-	100	-	205		001	ø	0.07	-	050
		x	141	Dł	101	//	1113	-	108	L	200		221	e	231		203
E	1110	<b>^</b>	142		150	"	174		100	l T	206		000		120		954
		Â	146	6	1100	>>	1114	-	1180		200		666		230	en.	204
F	11111	<b>"</b>	143		150	//	175		101		207		222		230	or	255
	1		1120	l I	1100		1110		1101		14VI		660		608	1	1400

EDGON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
EFSUN	Specification (STANDARD)	С	NEXT 26	SHEET 25

	HEX	8	9	Α	В	С	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
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U	0000	128	144	160	176	192	208	224	240
1	0001	ü	È	·	<b>***</b>	<u>ــــــــــــــــــــــــــــــــــــ</u>	<b>T</b>	ß	±
	0001	129	145	161	177	193	209	225	241
2	0010	é	Ê	ó	<b>*</b>	Τ	т	Γ	≥
		130	146	162	178	194	210	226	242
3	0011	â	Ô	ú				π	≤
		131	147	163	179	195	211	227	243
4	0100	A	E	100				$\Sigma$	
		132	148	104	180	196	212	228	244
5	0101	a (199		3	1		F	σ	
		133	149	3	101	181	213	229	240
6	0110	1 124	u [150	166	1			$\mu$	- 040
		134	100			1180		230	240
7	0111	5	u 151	167	1 192	<b>F</b>	T [015	L [021	~ 047
		Â	וו <u>ו</u> מ	<u>1101</u> <del>^</del>	103	188		- <u>231</u>	0
8	1000	[136	152	168	184	200	1 216	1 222	248
		ë	Ô	1100	1104	200		A 1232	•
8	1001	137	153	169	185	201	217	233	240
		è	Ü		1.00	L 1001		Ω	
A	1010	138	154	170	186	202	218	234	250
n	1011	ï	¢	$\frac{1}{2}$	7	<b>T</b>		δ	
ŭ	1011	139	155	171	187	203	219	235	251
C	1100	î	£	1	1	<b>F</b> -		<b>00</b> -	n
U	1100	140	156	172	188	204	220	236	252
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U.	1101	141	157	173	189	205	221	237	253
R	1110	Α	Û	«		<b>↓</b>		E	
<u> </u>		142	158	174	190	206	222	238	254
F	1111	8	f	»	ר	<b>⊥</b>		∩	SP
	1	143	159	175	191	207	223	239	255

# 3.2.5 Page 4 (PC863: Canadian-French)

	TITLE	SHEET	NO.	
FDSUN	TM-U375/U375P			
	Specification	с	NEXT	SHEET
	(STANDARD)	_	27	26

# 3.2.6 Page 5 (PC865: Nordic)

HEX       BIN       1000       1001       1010       1011       1100       1101       1110       1111         0       0000 $\bigcirc$ $\stackrel{\text{E}}{128}$ $\stackrel{\text{A}}{144}$ $\stackrel{\text{B}}{160}$ $\stackrel{\text{L}}{176}$ $\stackrel{\text{L}}{192}$ $\stackrel{\text{L}}{208}$ $\stackrel{\text{C}}{224}$ $\stackrel{\text{C}}{240}$ 1       0001 $\stackrel{\text{W}}{129}$ $\stackrel{\text{A}}{145}$ $\stackrel{\text{C}}{161}$ $\stackrel{\text{T}}{177}$ $\stackrel{\text{L}}{193}$ $\stackrel{\text{L}}{209}$ $\stackrel{\text{C}}{225}$ $\stackrel{\text{C}}{241}$ 2       0010 $\stackrel{\text{C}}{130}$ $\stackrel{\text{M}}{146}$ $\stackrel{\text{I}}{162}$ $\stackrel{\text{T}}{178}$ $\stackrel{\text{T}}{194}$ $\stackrel{\text{C}}{210}$ $\stackrel{\text{C}}{226}$ $\stackrel{\text{C}}{242$ 3       0011 $\stackrel{\text{R}}{130}$ $\stackrel{\text{G}}{147}$ $\stackrel{\text{I}}{163}$ $\stackrel{\text{T}}{197}$ $\stackrel{\text{L}}{196}$ $\stackrel{\text{T}}{211}$ $\stackrel{\text{C}}{227}$ $\stackrel{\text{C}}{243}$ 4       0100 $\stackrel{\text{R}}{133}$ $\stackrel{\text{I}}{148}$ $\stackrel{\text{I}}{180}$ $\stackrel{\text{I}}{197}$ $\stackrel{\text{L}}{213}$ $\stackrel{\text{C}}{229}$ $\stackrel{\text{C}}{243}$ 6       0101 $\stackrel{\text{A}}{133}$ $\stackrel{\text{I}}{148}$ $\stackrel{\text{I}}{181}$ $\stackrel{\text{I}}{197}$ $\stackrel{\text{C}}{213}$ $\stackrel{\text{C}}{224}$ $\stackrel{\text{C}}{244}$ $\stackrel{\text{C}}{233}$ $\stackrel{\text{C}}{2447}$ $\stackrel{\text{C}}{233}$		HEX		8		9		A		B		С		D		E		F
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0       0011       131       147       163       179       195       211       227       243         4       0100       ä       ö       ñ       +       -       E $\Sigma$ $f$ 5       0101       à       ò       Ñ       +       -       E $\Sigma$ $f$ 6       0101       à       ò       N       +       + $f$ $\sigma$ $J$ 6       0110       å       ù       a       · $h$ + $f$ $\sigma$ $J$ 6       0110       Å $134$ 150       166       182       198       214       230       245         6       0111 $\frac{1}{134}$ 150       166       182       198       214       230       246         7       0111 $\frac{9}{135}$ $\frac{1}{151}$ $167$ 183       199       215       231       247         8       1000 $\frac{9}{136}$ $\frac{1}{152}$ $168$ 184       200       216       232       244         9       1001 $\frac{1}{138}$ $\frac{1}{150}$ $168$	3	0011	â		ô		ú			<b></b>	-		L		π		$\leq$	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $				131		147		163		179		195		211		227		243
132       148       164       180       196       212       228       244         5       0101 $a$ $\circ$ $N$ $+$ $ 0$ 229       245         6       0110 $a$ $\alpha$ $a$ $+$ $ 0$ $229$ 245         6       0110 $a$ $\alpha$ $a$ $+$ $ 0$ $213$ $229$ $246$ 7       0111 $9$ $150$ 166 $182$ $198$ $214$ $230$ $246$ 7       0111 $9$ $151$ $167$ $183$ $199$ $215$ $231$ $247$ 8       1000 $e$ $y$ $c$ $ +$ $                                -$	4	0100	ä	<b>r</b>	ö		ñ		1		—				Σ		ן ן	
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$\begin{array}{c c c c c c c c c c c c c c c c c c c $				133		149		165		181		197		213		229	ŝ	245
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7       0111 $\bigcirc$ $\square$				134		150	_	166		182		198		214		230		246
$135$ $151$ $167$ $183$ $199$ $215$ $231$ $247$ 8 $1000$ $\hat{e}$ $\hat{y}$ $\hat{c}$ $7$ $\bullet$ $\bullet$ $\bullet$ $\circ$ 9 $1001$ $\hat{e}$ $\hat{o}$ $f$ $f$ $f$ $\phi$ $\circ$ 9 $1001$ $\hat{e}$ $\hat{O}$ $f$ $f$ $f$ $\phi$ $\circ$ A $1010$ $\hat{e}$ $\hat{U}$ $\neg$ $f$ $f$ $f$ $\phi$ $\circ$ B $1011$ $138$ $154$ $170$ $186$ $202$ $218$ $234$ $250$ B $1011$ $138$ $154$ $170$ $186$ $202$ $218$ $234$ $250$ C $1100$ $156$ $172$ $188$ $204$ $220$ $236$ $252$ D $1101$ $140$ $156$ $172$ $188$ $204$ $220$ $236$ $252$ D $1101$ $141$ $157$ $173$ $189$	7	0111	ç	405	u	1.74	₽		ר		┠		+		τ		≈	
8       1000       e       y       j       j       i       i       j <thj< th=""></thj<>			_	135		151	<u> </u>	167		183		199		215	<u> </u>	231		247
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	8	1000	е	100	У	100	5	100	٦	104			+		Φ		ľ	0.10
$\begin{array}{c c c c c c c c c c c c c c c c c c c $				136		152		108	-	184		200	<u> </u>	216		232		248
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	9	1001	e	107	0	150		100	1	105	F		-	017	θ	000	•	
A       1010       e       0       1       170       186       202       218       234       250         B       1011       i       ø $\frac{1}{2}$ $7$ $7$ $8$ $7$ $8$ $7$ $8$ $7$ $7$ $8$ $7$ $7$ $8$ $8$ $7$ $8$ $8$ $7$ $8$ $8$ $7$ $8$ $8$ $8$ $8$ $8$ $8$ $8$ $8$ $$			2	137		103		108		192	<b></b> _	201		217		233		249
B       1011       1 $\emptyset$ $\frac{1}{2}$ $\neg$ $\neg$ $\neg$ $\delta$ $$ B       1011       1 $\emptyset$ $\frac{1}{2}$ $\neg$ $\neg$ $\blacksquare$ $\delta$ $$ C       1100       1 $\pounds$ $\frac{1}{40}$ $155$ 171       187       203       219       235       251         C       1100       1 $\pounds$ $\frac{1}{40}$ $\frac{1}{156}$ $172$ 188       204       220       236       252         D       1101       1 $\emptyset$ $i$ $  \emptyset$ $2$ 237       253         E       1110       141       157       173       189       205       221       237       253         E       1110 $\ddot{A}$ Pt $\ll$ $\rightarrow$ $\rightarrow$ $\blacksquare$ $\in$ $\bullet$ F       1111 $\ddot{A}$ $f$ $\blacksquare$ $\neg$ $=$ $\bigcirc$ $\bigcirc$ $SP$ F       1111 $A$ $f$ $\blacksquare$ $\neg$ $=$ $\bigcirc$ $\bigcirc$ $SP$ F	A	1010	e	110	U	154	7	170		100	_	000	Г	010	Ω	0.04	•	050
B       1011       1       9       2       171       187       203       219       235       251         C       1100 $\hat{1}$ $\pounds$ $\frac{1}{4}$ $\blacksquare$ $F$ $\blacksquare$ $\infty$ $n$ D       1101 $\hat{1}$ $\emptyset$ $i$ $\blacksquare$ $\blacksquare$ $\emptyset$ $235$ $252$ D       1101 $\hat{1}$ $\emptyset$ $i$ $\blacksquare$ $\blacksquare$ $\emptyset$ $204$ $220$ $236$ $252$ D       1101 $\hat{1}$ $\emptyset$ $i$ $\blacksquare$ $\blacksquare$ $\emptyset$ $204$ $220$ $236$ $252$ D       1101 $\hat{1}$ $\emptyset$ $i$ $\blacksquare$ $\blacksquare$ $\emptyset$ $205$ $221$ $237$ $253$ E       1110 $\hat{A}$ Pt $\blacksquare$			;;	130	đ	104	1	170	_	100		202		218	6	234		250
C       1100 $\hat{1}$ $\hat{x}$ <	В	1011	1	120	Ø	155	2	171	ר	197	r	202		210	0	025	~	051
$\begin{array}{c c c c c c c c c c c c c c c c c c c $			î	108	ç	100	1	1111	1	101	L	203		218		-	n	201
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	C	1100	-	140	æ	156	4	172		188		204		220	<b>~</b>	226		252
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			ì	140	ø	100	:	112		100	_	204		220	a	230	2	202
E       1110       A       Pt $\ll$ $\Rightarrow$ $\Rightarrow$ $\Rightarrow$ $\Rightarrow$ $\blacksquare$ $\in$ $\blacksquare$ F       1111       A       f $\blacksquare$ $\Rightarrow$ $\Rightarrow$ $\Rightarrow$ $\Rightarrow$ $\Rightarrow$ $\blacksquare$ $\in$ $\blacksquare$ F       1111       A       f $\blacksquare$ $\bigcirc$	D	1101	-	141	Ø	157	•	173		180		205	-	221	Ø	937		252
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			X	141	Pł	1101	"	1110		108	L	200		661	E	201		200
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	E	1110	<b>n</b>	142	10	158	Ĩ	174		100	T	206		222		238		254
			8	146	f	1100	h	1114	-	1100	L	200		666		630	SD	204
	F	1111	n	143	J	159	1	175	1	101		207		223	''	230		255

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# 3.2.7 Page 254 (space page)

	HEX	8	9	A	В	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
Û	0000	SP	SP	SP	SP	SP	SP	SP	SP
	0000	128	144	160	176	192	208	224	240
1	0001	SP	SP	SP	SP	SP	SP	SP	SP
	0001	129	145	161	177	193	- 209	225	241
2	0010	SP	SP	SP	SP	SP	SP	SP	SP
	0010	130	146	162	178	194	210	226	242
3	0011	SP	SP	SP	SP	SP	SP	SP	SP
		131	147	163	179	195	211	227	243
4	0100	SP	SP	SP	SP	SP	SP	SP	SP
	5100	132	148	164	180	196	212	228	244
5	0101	SP	S P	SP	SP	SP	SP	SP	SP
U	0101	133	149	165	181	197	213	229	245
6	0110	SP	SP	SP	SP	SP	SP	SP	SP
	0110	134	150	166	182	198	214	230	246
7 0111	SP	S P	SP	SP	SP	SP	SP	SP	
1		135	151	167	183	199	215	231	247
8	1000	SP	SP	SP	SP	SP	SP	S'P	SP
U	1000	136	152	168	184	200	216	232	248
0	1001	SP	SP	SP	SP	SP	SP	SP	SP
9 	1001	137	153	169	185	201	217	233	249
4	1010	SP	SP	SP	SP	SP	SP	SP	SP
M	1010	138	154	170	186	202	218	234	250
R	1011	SP	SP	SP	SP	SP	SP	SP	SP
U 	1011	139	155	171	187	203	219	235	251
C	1100	SP	SP	SP	SP	SP	SP	SP	SP
	1100	140	156	172	188	204	220	236	252
n	1101	SP	SP	SP	SP	SP	SP	SP	SP
IJ	1101	141	157	173	189	205	221	237	253
	1110	SP	SP	SP	SP	SP	SP	SP	SP
Ċ	1110	142	158	174	190	206	222	238	254
7	1111	SP	S P	SP	SP	SP	SP	SP	SP
F F		143	159	175	191	207	223	239	255

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# 3.2.8 Page 255 (space page)

	HEX		8		9		A		B	(	C		D		E		F
HEX	BIN	1	000	1	100	10	010	E	)	1	00	ł	101	1	10	1	111
۵	0000	SP		SP		SP		SP		SP		SP		SP		SP	
0	0000		128		144		160		176		192		208		224		240
1	0001	SP		SP		SP	_	SP		SP		SP		SP	·	SP	
	0001		129		145		161		177		193	-	209		225		241
9	0010	SP	·	SP		SP		SP		SP		SP		SP		SP	
<u>د</u>			130		146		162		178		194		210		226		242
3		SP		SP		SP		SP		SP		SP		SP		SP	
			131		147		163		179		195		211		227		243
4		SP	r	SP		SP		SP		SP		SP		SP		SP	
			132		148		164		180		196		212		228		244
5		SP		SP	, <u>`</u>	SP		SP		SP		SP	·····	SP		SP	
			133		149		165		181		197		213		229		245
6	0110	SP		SP		SP	,	SP		SP		SP		SP		SP	
			134		150		166		182		198		214		230		246
7	0111	SP		SP		SP		SP		SP		SP		SP	<i></i>	SP	
			135		151		167		183		199		215		231		247
8	1000	SP	·····	SP		SP		SP		SP		SP		SP		SP	,
	1000		136		152		168		184		200		216		232		248
0	1001	SP		SP		SP		SP		SP		SP		SP		SP	
J	1001		137		153		169		185		201		217		233		249
Å	1010	SP		SP		SP		SP		SP		SP		SP		SP	
	1010		138		154		170		186		202		218		234		250
R	1011	SP		SP		SP		SP		SP		SP		SP		SP	
			139		155		171		187		203		219		235		251
ſ	1100	SP		SP		SP		SP		SP		SP		SP	,	SP	
	1100		140		156		172		188		204		220		236		252
n		SP	,	SP		SP		SP		SP		SP		SP	,	SP	
			141		157		173		189		205		221		237		253
ŗ	1110	SP	,	SP		SP		SP		SP		SP		SP		SP	
£ 			142		158		174		190		206		222		238		254
r	1111	SP		SP		SP		SP	·	SP		SP		SP		SP	
r			143		159		175		191		207		223	}	239		255

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# 3.2.9 International character set

							A	SCIL	code					
Cour name	ntry e	HEX DEC	23 35	24 36	40 64	5B 91	5C 92	5D 93	5E 94	60 96	7B 123	7C 124	7D 125	7E 126
0 U.S	S.A.		#	\$	@	[	\	]	^	`	{		}	~
1 Fra	nce		#	\$	à	0	ç	§	^	``	é	ù	è	••
2 Gei	rmany		#	\$	§	Ä	Ö	Ü	^	``	ä	ö	ü	β
3 Eng	gland		£	\$	@	E	$\setminus$	]	^	``	{	1	}	~
4 Der	nmark I		#	\$	@	Æ	ø	Å	^	``	e e	ø	å	~
5 Sw	eden		#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
6 Ital	у		#	\$	@	0	$\setminus$	é	^	ù	à	ò	è	ì
7 Spa	ain		Pt	\$	@	i	Ñ	Ś	^	``	••	ñ	}	~
8 Jap	an		#	\$	@	]	¥	]	^	``	<b>{</b> .	   	}	~
9 Nor	way		#	¤	É	Æ	ø	Å	Ü	é	æ	ø	å	ü
10 Der	nmark II		#	\$	É	Æ	ø	Å	Ü	é	æ	ø	å	ü

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# 3.3 Switches and Buttons

#### 3.3.1 Power switch

The power switch (rocker switch) is on the lower right front of the printer and turns the power on or off. Operator control of the power switch can be prohibited by using the included power switch cover. NOTE: Be sure to connect the power supply connector before turning on the power.

#### 3.3.2 Panel buttons

The **ESC c 5** command enables or disables the panel buttons. When disabled, none of the buttons will function.

#### 1) RELEASE button

[Type] Non-locking push button

[Function] Releases the paper clamp.

- NOTES: When the printer cover is open, this button is disabled regardless of the **ESC c 5** setting.
  - When changing the ribbon cassette is required during printing, open the printer cover and press this button to release the paper clamp.
  - If the paper clamp is released by this button while printing on a cut sheet, the print position may shift, and the status information transmitted by the **GS r 3** command may be incorrect. In this case, bit 1 of the fourth byte of ASB (for slip paper) or bit 4 (for validation paper) is set to 1 to inhibit printing.
  - If cut sheet mode is not selected, the printer automatically releases the paper clamp if it does not receive data for approximately 10 seconds.

#### 2) PAPER FEED button

- [Type] Non-locking push button
- [Function] Feeds paper based upon the line feed amount set by the ESC 2 and ESC 3 commands.
- NOTE: When the printer cover is open, this switch is disabled regardless of the **ESC c 5** setting.

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### 3.3.3 Paper load switch

[Type] Non-locking lever switch

- [Function] Loads paper from a paper roll. Performs fast paper feeding regardless of the paper feed amount set by the **ESC 2** and **ESC 3** commands.
- NOTES: This switch is on the upper part of the printer.
  - When the printer cover is open, only this switch can perform paper feeding.
  - This switch is not affected by the **ESC c 5** setting.
  - If only cut sheet is selected by **ESC c 0**, a paper roll cannot be loaded by using this switch.

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	(STANDARD)	С	33	32

### 3.3.4 DIP switches

#### 3.3.4.1 RS-232 interface model

1) DIP switch 1

#### Table 3.3.1 DIP Switch 1

Switch No.	Function	ON	OFF
1	Data reception error	Ignored	Prints '?'
2	Receive buffer capacity	40 bytes	4K bytes
3	Handshaking	XON/XOFF	DTR/DSR
4	Word length	7 bit	8 bit
5	Parity check	Yes	Νο
6	Parity selection	Even	Odd
7	Baud rate selection		
8	See Table 3.3.2		

#### 2) Baud rate selection

### Table 3.3.2 Transmission Speed

Transmission Speed	Switch No.			
(BPS)	7	8		
1200	ON	ON		
2400	OFF	ON		
4800	ON	OFF		
9600	OFF	OFF		

BPS: Bits Per Second

#### 3) DIP switch 2

#### Table 3.3.3 DIP Switch 2

Switch No.	Function	ON	OFF
1	Connection of customer display (see Note 1)	Connected	Not connected
2	Selects number of characters per line (CPL) 7×9 font / 5×9 font (see Note3)	42CPL/35CPL	40CPL/33CPL
3	Handshaking operation (busy condition)	Receive buffer full	Off-line or receive buffer full
4			
5	For internal use only (see Note 2)		
6			
7	Pin 6 reset signal (see Note 4)	Used	Not used
8	Pin 25 reset signal (see Note 4)	Used	Not used

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- NOTES 1. This function can be used only when a customer display is attached to the DM connector.
  - 2. Never change the settings of DIP switches 4, 5, and 6.
  - 3. See Appendix J, Notes on Number of Printable Columns.
  - DIP switch settings cannot be changed after the power is turned on or after the printer is reset through the interface. When turning the power on, do not change the settings of DIP switches 7 and 8.

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### 3.3.4.2 Parallel interface model

1) DIP switch 1

Table	3.3.4	DIP	Switch	1
Iabio			0111011	

Switch No.	Function	ON	OFF
1	Automatic return	Enabled	Disabled
2	Receive buffer full	40 bytes	4K bytes
3	Undefined		
4	Undefined		
5	Undefined		
6	Undefined		
7	Undefined		
8	Undefined		

#### 2) DIP switch 2

### Table 3.3.5DIP Switch 2

Switch No.	Function	ON	OFF
1	Undefined		
2	Selects number of characters per line (CPL) 7×9 font/5×9 font (see Note 1)	42CPL/35CPL	40CPL/33CPL
3	Handshaking operation (busy condition)	Receive buffer full	Off line or receive buffer full
4	For internal use only		
5	For Internal use only		
6	(see Note 2)		
7	Undefined		
8	nlnit reset signal (see Note 3)	Fixed to ON	

\*1: See Appendix J Notes on Number of Printable Columns.

- \*2: Never change the settings for these DIP switches 4, 5 and 6.
- \*3: Fixed to ON. Never change this setting.
- NOTE: The DIP switch settings are read and become effective only when the power is turned on or printer is reset using interface. Therefore, changing the settings while the power is on do not have any effect.

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#### 3.4 Panel LED Indicators

- 1) Power supply (POWER) LED: Green
  - ON: Power supply is stable.
  - OFF: Power supply is not stable.

2) Paper roll near-end (JOURNAL OUT) LED: Red

- ON: Near-end of paper roll is detected.
- OFF: Adequate paper remains on the paper roll (normal condition).
- Blinking: Waiting for restarting test printing on paper roll. (See Section 3.5.)

#### 3) Cut sheet (VALIDATION/SLIP) LED: Green

- ON: Cut sheet mode.
- OFF: Paper roll mode.
- Blinking: Waiting for cut sheet insertion/removal. (See Figure 3.4.1.)





- NOTE: If a cut sheet is removed when the printer is waiting for cut sheet removal, VALIDATION/SLIP light stays on. (The light was blinking in the waiting state.) Then approximately two seconds later, the printer automatically enters paper roll mode.
- 4) Error (ERROR) LED: Red
  - ON: Off-line (except during paper feeding using the PAPER FEED button and during the selftest).
  - OFF: Normal operation.
  - Blinking: Error state. (See Section 3.8, Error Processing)



Figure 3.4.2 Panel Buttons and Indicators

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### 3.5 Self-test

1) The printer has a self-test function that checks the following:

- Control circuit functions
- Printer mechanisms
- Print quality
- Control ROM version
- DIP switch settings

#### 2) Self-test on paper roll

[Starting the self-test]

To start the self-test on a paper roll, hold down the feed button and turn on the printer with the cover closed. The printer then prints the current printer status, which provides the following information:

- Control ROM version
- DIP switch settings

[Self-test standby state]

After printing the current printer status, the printer prints the message Self-test printing. Press PAPER FEED button". The JOURNAL OUT LED blinks, and the printer enters the test printing standby state.

Press the feed button in this state to start test printing.

3) Self-test on slip paper

Hold down the RELEASE button and turn on the printer.

The VALIDATION/SLIP LED blinks and the printer waits for slip paper. Insert the slip paper to start printing.

4) Self-test on validation paper

Hold down the PAPER FEED and RELEASE buttons and turn on the printer.

The VALIDATION/SLIP LED blinks and the printer waits for validation paper. Insert the validation paper to start printing.

5) Ending the self-test

After a number of lines are printed, the printer indicates the end of the self-test by printing "\*\*\* completed \*\*\*", performs initialization, and then goes to normal mode.

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#### 3.6 Hexadecimal Dumping

1) Hexadecimal dump function

This function prints the data transmitted from the host in hexadecimal numbers and their corresponding characters.

2) Starting hexadecimal dumping

Open the cover and turn on the power while pressing the FEED button, then close the cover. The printer first prints "Hexadecimal Dump" on the paper roll, and prints the data received thereafter in hexadecimal numbers and their corresponding characters.

NOTES: 1. "." is printed if no character corresponds to the data received.

- 2. During hexadecimal dumping, all commands except **DLE EOT** and **DLE ENQ** are disabled.
- 3. If there is insufficient print data to fill one line (such as at the end of a hexadecimal dump), the data will not print. (This means that 8-byte data is required to print one line.) The remaining data in this case can be printed by placing the printer in off-line mode by opening the cover or pressing the PAPER FEED button.
- 3) Ending hexadecimal dumping

End hexadecimal dumping by turning off the power or by resetting the printer after printing completes.

< Example printing >

Hexadecimal Dump

1B       21       00       1B       26       02       40       40       1         1B       25       01       1B       63       34       00       1B       1         41       42       43       44       45       46       47       48       1	! & @ @ % c4 \BCDEFGH
---	-----------------------------

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# 3.7 Printing on Cut Sheets

Use the following procedure to print on slip or validation paper.

	User Operation	Printer Operation
1	Transmit the <b>ESC c 0</b> command.	Switches to cut sheet mode and waits for a cut sheet to be loaded, according to the time set by the <b>ESC f</b> <i>t1 t2</i> command.
		The VALIDATION/SLIP LED blinks.
2	Insert the paper.	Detects the cut sheet and lights the VALIDATION/SLIP LED.
		When using slip paper, detects the slip after the set time ( <i>t2</i> ) has passed. If the slip is not detected, re-enters the slip waiting state. When the slip paper is detected, feeds the slip as far as the print start position, the redetects the slip and waits for the print data. If the slip is not detected after feeding the paper, re-enters the slip waiting state.
		When using validation paper, detects the paper after the set time ( <i>t2</i> ) has passed. If the paper is not detected, re-enters the validation paper waiting state. When the validation paper is detected, waits for the print data.
		If no cut sheet is inserted within the set time ( <i>t1</i> ), switches from cut sheet mode to paper roll mode automatically.
3	Transmit data and commands.	Prints the data and feeds the paper.
4	Transmit the <b>FF</b> command.	After printing, ejects the paper and selects paper roll mode.
		Turns off the VALIDATION/SLIP LED.

Table 3.7.1	Printing on	Slin/Validation	Dana
	Printing on	Silp/validation	Pape

NOTES: 1. When using a cut sheet that is narrower than the carriage movement range, never turn the power off and open the cover, transmit the return home command (**ESC**<) or reset the machine with the interface after putting the printer into cut sheet mode and inserting a cut sheet.

Allowing the carriage to move from the home position across the edge of the paper may cause a paper jam.

- 2. The cut sheet waiting state can be canceled by the **DLE ENQ 3** command.
- 3. Use the ASB function to correctly determine the paper state. (See Appendix I, *Example Print Control for Cut Sheets.*)

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# 3.8 Error Processing

### 3.8.1 Error types

1) Errors that automatically recover

#### Table 3.8.1 Automatically Recoverable Errors

Error	Description	ERROR LED blinking pattern	Recovery
Print head temperature error (*)	The head temperature is extremely high.		Automatically recovers when the print head temperature falls.

(\*) Print head temperature error is not abnormality.

2) Errors that may be recovered via commands

Error	Description	ERROR LED blinking pattern	Recovery
Home position detection error	Home position cannot be detected due to a paper jam or other problem.		Recovers by DLE ENQ 1 or DLE ENQ 2.
Carriage detection error (See Note 1)	Carriage motor is malfunctioning due to a paper jam or other problem.		Recovers by DLE ENQ 1 or DLE ENQ 2.
Slip/validation paper ejection error (See Note 2)	Slip or validation paper is not ejected even when the required amount is fed.		Recovers by DLE ENQ 1 or DLE ENQ 2.

#### Table 3.8.2 Command-recoverable Errors

NOTES: 1. Paper jams occurring outside the carriage movement range cannot be detected.

- 2. Paper jams occurring after the paper passes the cut sheet sensor cannot be detected.
- 3. Command-recoverable errors are recovered using **DLE ENQ 1** and **DLE ENQ 2** after the cause is removed. They are also recovered when the printer power is turned off and on again after the cause is removed. However, in this case any data in the buffer is lost.
- 4. When the printer recovers from an error using DLE ENQ 1 with cut sheet mode selected, the printer ejects the cut sheet and then executes loading. When the printer recovers from a cut sheet ejection error, the printer checks for paper ejection but does not execute loading.
- 5. When the printer recovers from an error using **DLE ENQ 2** with cut sheet mode selected, the printer checks to make sure that the remaining paper is removed and then enters paper roll mode.

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3) Errors that cannot be recovered

Error	Description	ERROR LED blinking pattern → ← Approx. 160msec	Recovery
Memory or gate array R/W error	After R/W checking, the printer does not work correctly.		Impossible to recover.
High voltage error	Power supply voltage is extremely high.		Impossible to recover.
Low voltage error	Power supply voltage is extremely low.		Impossible to recover.
CPU execution error	CPU executes incorrect address.		Impossible to recover.
Drive circuit error	An error occurs in the mechanism drive circuit.		Impossible to recover.

 Table 3.8.3
 Unrecoverable Errors

NOTE: If an error that cannot be recovered occurs, turn off the power as soon as possible.

### 3.8.2 Operation when an error is detected

The printer executes the following operations when detecting an error:

- Stops all printer operations.
- Goes off-line. (When the DIP switch 2-3 is OFF.)

#### 3.8.3 Data reception error

If any of the following data reception errors occur during serial interface communication, the printer prints "?" or ignores the data, according to the setting of DIP switch 1-1.

- Parity error
- Framing error
- Overrun error

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#### 3.9 Paper Sensors

The printer has the following paper sensors:

- Paper roll near-end sensor
- Cut sheet sensor

#### 3.9.1 Sensors and LED indicators

1) Paper roll near-end sensor

This sensor is installed on the paper roll supply device. It detects a paper near-end by monitoring the paper roll diameter. The JOURNAL OUT LED lights when the paper roll diameter becomes sufficiently small.

2) Cut sheet sensor

This sensor is installed in the cut sheet path. It detects insertion and ejection for cut sheet. This sensor also detects the presence of cut sheet in the paper path.

The VALIDATION/SLIP LED lights, blinks, or goes off, depending on the printer status. (See Section 3.4, Panel LED Indicators.)

#### 3.9.2 Sensors and printing

When the printer detects a paper-end, it stops or continues printing, depending on the **ESC c 4** command setting. The paper roll near-end and cut sheet sensors are enabled. The printer operation then differs depending on the paper type, as follows:

1) Paper roll mode

When printing stop is selected, the printer automatically goes off-line when a paper-end is detected. To restart printing, load the paper and set the printer back on-line by closing the cover.

#### 2) Cut sheet mode

When printing stop is selected, the printer detects a paper-end and prints data to the end of the printable area, ejects the cut sheet, and then waits for another cut sheet to be inserted.

#### 3.10 Cover-open Sensor

This sensor monitors the printer cover. When the sensor detects an open cover, the printer automatically goes off-line, stops printing, and moves the print head to the center, after printing the current line. The printer goes back on-line when the printer cover is closed.

#### 3.11 Buffer-full Printing

When subsequent data is received after the printer processes one line of data in the print buffer, the printer automatically prints the processed line and feeds the paper by one line.

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#### 3.12 Loading and Removing the Paper Roll

#### 1) Loading the paper

When the printer cover is open and the power is on, paper from the paper roll is automatically fed by pressing the paper load switch (located on the top of the head cover) and inserting the paper into the paper path. Hold down the paper load switch until the paper appears from the paper exit. When inserting paper from the paper roll into the paper entrance, make sure that the edge of the paper roll is folded straight, as shown in Figure 3.12.1.



Figure 3.12.1 Paper Edge

2) Removing the paper

The paper can be removed by pulling it out in the paper feed direction while pulling the release lever (located on the left side of the paper roll) toward you. Be sure to pull out the paper in the paper feed direction to prevent damage to the printer mechanism.

#### 3.13 Clamshell Mechanism

This mechanism should be used to remove paper jams and objects accidentally dropped into the printer. Raise the mechanism while pulling the lever on its right side in the direction of the arrow. This will open the head cover.

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#### 3.14 Page Mode

#### 3.14.1 General description

The printer operates in two print modes: standard mode and page mode. In standard mode, the printer prints and feeds paper each time it receives print and paper feed commands. In page mode, all the received print and paper feed commands are processed in the specified memory, and the printer executes no operations. All the data in the memory is then printed when an **FF** command is received.

For example, when the printer prints the data "ABCDEF" and feeds the line, "ABCDEF" is printed and the paper is fed one line in standard mode. In page mode, "ABCDEF" is written to the specified printing area in memory, and the position in memory for the next print data is shifted by one line.

The **ESC L** command puts the printer into page mode and all commands received thereafter are processed in page mode. Executing an **FF** command collectively prints the received data and then restores the printer to standard mode.



Figure 3.14.1 Print Modes

- NOTES: 1. Unidirectional printing using **ESC U 1** is recommended in page mode. Bidirectional printing may cause incorrect printing pitch.
  - 2. By setting of a default value (using **ESC U 1**) at power-on, page mode will specify unidirectional printing.

#### 3.14.2 Page mode limitations

Page mode has the following limitations:

1) Half-dots are not usable

Page mode can handle only normal dots. Therefore, the  $7 \times 9$  dot font, user-defined characters including half-dots, and bit images cannot be specified. Since setting values with the **ESC SP**, **ESC \$**, **ESC 1**, **ESC 3**, **ESC D**, **ESC J**, and **ESC W** commands uses half-dot references, these values must be converted into values referenced to normal dots. Under these conditions, displacement by one half-dot may occur. Therefore, concerning the following command functions, only setting is possible.

- $7 \times 9$  font specification using **ESC** !.
- Double-density bit image specification using ESC +.
- Double-density down-loaded bit image specification using GS I.
- 2) Double-strike printing is not permitted.

In page mode, data written twice to the same area is logically OR'ed before printing. Therefore, double-strike mode cannot be used to emphasize characters.

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#### 3.14.3 Setting values in standard and page modes

- 1) The values set by commands are common to both standard and page modes. However, values are set independently in each mode for the ESC SP, ESC 2, ESC 3, and ESC U commands.
- 2) Although the maximum number of printable dots for a bit image is 400 in standard mode, 704 bitimage dots can be printed in the y direction (paper feeding direction) in page mode. (This is possible only when 704 printable-area dots in the y direction have been specified using **ESC W**, and the printing direction value *n* in the **ESC T** command is 1 or 3).

#### 3.14.4 Development of print data in the printable area

Development of print data in the printable area is performed as follows:

- ① The printable area is set using ESC W. When all printing and feeding are complete before the printer receives the ESC W command, the left side as you face the printer is taken as the origin (x0, y0) of the printable area. The printable rectangular area is defined by the length (dx dots) extending from and including the origin (x0, y0) in the x direction (perpendicular to the paper feed direction), and by the length (dy dots) in the y direction (paper feed direction).
- <sup>(2)</sup> When the printer receives print data after **ESC W** sets the printable area and **ESC T** sets the printing direction, the print data is developed within the printable area so that point A in Figure 3.14.2 is at the beginning of the printable area as a default value.

Print data containing double-height characters, quadruple-size characters, bit image, a dn downloaded bit images is developed from the lower left (point B in Figure 3.14.2) of the character patterns or image data).

- ③ If the print data exceeds the printable area (including the space to the right of a character) before a command (e.g., LF, ESC J) that includes line feeding is received, line feeding is executed automatically within the printable area. The development position therefore moves to the beginning of the next line. The line feed amount depends on the values set by command (ESC 2, ESC 3, etc.).
- ④ The default value of the line spacing is set to 1/6 inch and corresponds to 12 dots in the vertical direction. If the print data for the next line contains double-height or quadruple-size characters or bit-images developed to two or more lines, the amount of line feeding may be insufficient, resulting in overlapping of the characters' higher-order dots with the previous line. To avoid this, increase the amount of line feeding. The line spacing in Figure 3.14.2 on the next page requires 15 dots (30 pitch) or more.

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#### <u>Example</u>

When printing a downloaded bit image of three-byte data for the vertical direction, use the following formula:

{number of vertical dots (8  $\times$  3) - number of dots for feeding at the beginning of the printable area (9)}  $\times$  number of half-dot conversions (2) = 30

Therefore, 15 dots (30 pitch) are required for feeding.

Use the following commands:

ESC W xL, xH, yL, yH, dxL, dxH, dyL, dyH

ESC T n

ESC 3 30 < Set line spacing to be added.

LF

**GS** \ 1



Figure 3.14.2 Print Data Developing Position

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# 4. CASE SPECIFICATIONS

# 4.1 External Dimensions and Weight

Height:	145 mm (5.7")
Width:	186 mm (7.3")
Depth:	327 mm (12.9")
Weigh:	Approximately 4.0 kg (8.8 lbs)

### 4.2 Color

Epson standard gray

### 4.3 External Appearance



Figure 4.3.1 External Appearance

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# 5. ACCESSORIES AND OPTIONS

### 5.1 Standard Accessories

- Exclusive ribbon cassette (ERC-38 (P))
- Paper roll (Ø60 mm (2.36") 5 1 roll)
- Operator's manual
- Power switch cover
- Hexagonal lock screw (metric) (For only the RS-232 serial interface model.)

# 5.2 Options

### 5.2.1 Power supply

- 1) When using only the TM-U375 or TM-U375P External power supply PS-150
- 2) When using the printer with the intelligent module (IM) (For only the RS-232 serial interface model.) The printer power is supplied through the intelligent module. Concerning the power supply of the intelligent module, refer to the specifications of the intelligent module.

# 5.2.2 Display devices (For only the RS-232 serial interface model)

- 1) Pass-through: Customer displays DM-D101II and DM-D202II
- 2) Direct connection between the printer and customer display (DM-D) connectors Customer displays DM-D102 and DM-D203

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# **6. COMMAND DESCRIPTIONS**

# 6.1 Command Notation

# XXXX

[Name]	The name of the command.
[Format]	The code sequence. The numbers denoted by $< >H$ are hexadecimal, by $< >B$ are binary, and by $< >$ are decimal.
	[] A indicates the contents of the [] should be repeated A times.
[Range]	Gives the allowable ranges for the arguments.
[Description]	Describes the function.
[Notes]	Provides important information on setting and using the printer command, if necessary.
[Default]	Gives the default values if any for the command arguments.
[Reference]	Lists related commands.
[Example]	Gives examples of how to use the command.

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# 6.2 Command Descriptions

# ΗT

[Name]	Horizontal tab	
[Format]	<09>H	
[Description]	Moves the print position to the next horizontal tab position.	
[Notes] • Horizontal tab positions are set with <b>ESC D</b> .		
	<ul> <li>This command is ignored unless the next horizontal tab position has been set.</li> </ul>	
	- The default tab positions are at intervals of 8 characters (columns 9, 17, 25) for the 7 $\times$ 9 font.	
[Reference]	ESC D	

# LF

•	
[Name]	Line feed
[Format]	<0A>H
[Description]	Prints the data in the print buffer and feeds one line based on the current line spacing.
[Note]	<ul> <li>Sets the print starting position to the beginning of the line.</li> </ul>
	<ul> <li>When printing on the paper roll includes paper feeding of more than 8.5 mm (48/144 inches), printing speed may be slower because of carriage movement prior to paper feeding.</li> </ul>
[Reference]	ESC 2, ESC 3

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	Specification (STANDARD)	С	NEXT 49	SHEET 48

# FF

[Name] [Format]	Eject cut sheet and return to standard mode <0C>H		
The command	a functions differently depending on the current mode (standard or page).		
< Standard m	ode >		
[Description]	Prints the data in the print buffer and ejects the sheet.		
[Notes]	<ul> <li>This command is enabled only when cut sheet is selected for printing.</li> </ul>		
	<ul> <li>When the eject length has been set by ESC C, the printer ejects the cut sheet based on the current eject length regardless of the cut sheet sensor state. Otherwise, the printer ejects the cut sheet completely.</li> </ul>		
	<ul> <li>Paper from the paper roll is not ejected, even if it is also selected.</li> </ul>		
	<ul> <li>After cut sheet ejection, the paper roll is selected for printing.</li> </ul>		
	<ul> <li>The cut sheet is ejected in the forward direction only.</li> </ul>		
[Reference]	ESC C, ESC c 0		
< Page mode	>		
[Description]	Prints the data developed collectively and switches to standard mode. All the developed data is deleted after being printed, but the paper is not ejected.		
[Reference]	ESC L		

# CR

[Name]	Carriage return
[Format]	<0D>H
[Description]	Serial interface printer
	<ul> <li>Prints one-line of data from the print buffer and feeds no paper.</li> </ul>
	<ul> <li>Sets the print starting position to the beginning of the line.</li> </ul>
	Parallel interface printer
	When auto-line feed is enabled, this command has the same functions as <b>LF</b> . When auto-line feed is disabled, the printer only prints data and does not feed paper.
[Notes]	Sets the print starting position to the beginning of the line.
[Reference]	LF

EPSON	TITLE TM-U375/U375P	SHEET NO. REVISION		
	Specification (STANDARD)	D	NEXT 50	SHEET 49

# DLE EOT n

[Format] <10>H<04>H<n>

[Range]  $1 \le n \le 6$ 

[Description] Transmits the selected printer status specified by *n*, in real time, according to the following parameters:

n	Function
1	Transmit printer status
2	Transmit off-line factor status
3	Transmit error factor status
4	Transmit paper roll sensor status
5	Transmit slip paper status
6	Transmit validation paper status

[Notes]

• The printer transmits the status upon receiving this command.

- When transmitting status, the printer transmits only one byte without checking the DSR state.
- The cut sheet status may not be correct for paper with holes, such as sprocket-feed paper.
- With the serial interface model, this command is executed even in off-line or receive buffer-full state.
- With the parallel interface model, this command is executed even in off-line if the DIP switch 2-3 is set ON.
- This command is transmitted anytime the data sequence <10>H<04>H<n> ( $1 \le n \le 6$ ) is received, even if it appears as part of another command.

<Example>

In ESC \* *m* n1 n2 [d] n1 + 256 × n2, d1 = 16 <10>H, d2 = 4 <04>H, d3 = <1>

• This command should not be used within the data sequence of another command that consists of two or more bytes.

<Example>

- If you attempt to transmit **ESC 3** *n* to the printer, but **DLE EOT 3** interrupts before *n* is received, the code <10>H for **DLE EOT 3** is processed as the code for **ESC 3** <10>H. Be aware of this.
- When Auto Status Back (ASB) is enabled using **GS a**, the status transmitted by **DLE EOT** and the ASB status must be differentiated, by using the table in Appendix F.
- If *n* is out of the specified range, this command is ignored.
- The status information to be transmitted is shown in the following tables.

EPSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	С	NEXT 51	SHEET 50
#### n = 1: Printer status

Dit	Function	Printer Status		
ы	Fulletion	0	1	
0	Not used	Fixed	d to 0	
1	Not used	Fixed to 1		
2	Drawer kick-out connector pin 3	Low	High	
3	3 On-line/Off-line state On-line Off		Off-line	
4	Not used	Fixed to 1		
5	Not defined			
6	Not defined			
7	Not used	Fixed	d to 0	

#### n = 2: Off-line factor status

Dit	Function	Off-line Factor Status	
ы	Function	0	1
0	Not used	Fixed	d to 0
1	Not used	Fixed to 1	
2	Cover status	Closed	Open
3	Paper feeding by PAPER FEED button	Not feeding Feeding	
4	Not used	Fixed to 1	
5	Printing stop due to a paper-end	No paper-	Printing
		end stop	stops
6	Error	No error Error occur	
7	Not used	Fixed to 0	

# Bit 5: Becomes 1 (printing is stopped) when printing stops due to the states of the paper and paper sensor selected by **ESC c 0** and **ESC c 4**.

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LFSUN	Specification (STANDARD)	С	NEXT 52	SHEET 51

#### n = 3: Error factor status

Dit	Function	Error Factor Status		
ы	Function	0	1	
0	Not used	Fixed to 0		
1	Not used	Fixed to 1		
2	2 Mechanical error Erro		Error occurs	
3	Not defined			
4	Not used	Fixed to 1		
5	Unrecoverable error	No error	Error occurs	
6	B Head temperature No error Error o		Error occurs	
7	Not used	Fixed to 0		

Bit 2: Mechanical errors include home position detection, carriage detection, and cut sheet ejection errors.

If this error occurs due to a paper jam, or the like, the printer can be recovered with **DLE ENQ** n ( $1 \le n \le 2$ ) after the cause is removed. If an error occurs due to a circuit failure (e.g., wire break), the printer cannot be recovered.

Bit 6: If the head temperature rises past the limit, the printer stops printing and bit 6 remains 1 (error occurs) until the print head temperature drops sufficiently. The printer automatically recovers from this error.

#### *n*=4: Continuous paper sensor status

Dit	Function	Value		
ы	Function	0	1	
0	Not used	Fixed to 0		
1	Not used	Fixed to 1		
2	Paper roll near-end	Paper	Near-end	
3		adequate	detected	
4	Not used	Fixed to 1		
5	Not defined			
6	Not used			
7	Not used	Fixed to 0		

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EFSUN	Specification (STANDARD)	С	NEXT 53	SHEET 52

#### n = 5: Slip paper status

Dit	Function	Value		
ы	Function	0	1	
0	Not used	Fixed	d to 0	
1	Not used	Fixed to 1		
2	Slip paper selection	Selected	Not selected	
3	Slip insertion waiting	Not waiting Waiting		
4	Not used	Fixed to 1		
5	Cut-sheet sensor	Paper exists	No paper	
6				
7	Not used	Fixed to 0		

Bit 2: There may be a time lag before actual slip selection takes place after reception of **ESC c 0**. During this period, bit 2 is 1 (slip paper is not selected).

Bit 3 : Becomes 0 (slip insertion is not waiting) immediately before starting loading, after slip paper is detected.

Bits 5 and 6 :

Transmit the current state of the cut sheet sensor.

n = 6: Validation paper status

Dit	Function	Value		
ы	Function	0	1	
0	Not used	Fixed	d to 0	
1	Not used	Fixed to 1		
2	Validation paper selection	Selected Not select		
3	Validation insertion waiting	Not waiting Waiting		
4	Not used	Fixed to 1		
5	Cut-sheet sensor	Paper exists	No paper	
6				
7	Not used	Fixed to 0		

Bit 2: There may be a time lag before actual slip selection takes place after reception of **ESC c 0**. During this period, bit 2 is 1 (slip paper is not selected).

Bit 3 : Becomes 0 (validation insertion is not waiting) immediately before starting loading, after validation paper is detected.

Bits 5 and 6 :

Transmit the current state of the cut sheet sensor.

[Reference] DLE ENQ, ESC u, ESC v, GS ENQ, GS a, GS r APPENDIX F, *Transmit Status Identification*; Appendix I, *Example Print Control for Cut Sheets* 

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EFJUN	Specification (STANDARD)	С	NEXT 54	SHEET 53

### DLE ENQ n

[Name]	Real-	time request to printer		
[Format]	<10>H<05>H< <i>n</i> >			
[Range]	$1 \le n \le 3$			
[Description]	Resp on the	onds to a request from the host specified by $n$ . The operations performed depends e value of $n$ , as follows:		
	n	Function		
	1	Recover from an error and restart printing from the line where the error occurred		
	2	Clear the receive and print buffers and recover from an error		
	3	Cancel waiting for cut sheet		
[Notes]	• The • Thi	e printer executes this command upon receiving this command. s command is executed even in the off-line, receive buffer-full, or error states.		
	<ul> <li>This command is transmitted anytime the data sequence &lt;10&gt;H&lt;05&gt;H<n> (1 ≤ n ≤ 3) is received, even if it appears as part of another command.</n></li> <li><example></example></li> </ul>			
		n <b>ESC</b> * <i>m n1 n2 [d] n1</i> + 256 × <i>n2</i> . <i>d1</i> = 16 <10>H. <i>d2</i> = 4 <04>H. <i>d3</i> = <1>		
	• This command should not be used within the data sequence of another command that consists of two or more bytes.			
	<e:< td=""><td>xample&gt;</td></e:<>	xample>		
	1  : 	you attempt to transmit <b>ESC 3</b> <i>n</i> to the printer, but <b>DLE ENQ 3</b> interrupts before <i>n</i> is received, the code <10>H for <b>DLE ENQ 3</b> is processed as the code for <b>ESC 3</b> :10>H.		
	• DL Thi tem	<b>E ENQ 1</b> restarts printing from the line where the error occurred. s command is available only for recoverable errors other than a print head operature error.		
	• DL rec wer be tha • The	<b>E ENQ 2</b> enables the printer to recover from an error after clearing the data in the eive and print buffers. The printer retains the settings (from ESC!, ESC 3, etc.) that re in effect when the error occurred. Using DLE ENQ 2 and ESC @, the printer can completely initialized. DLE ENQ 2 is available only for recoverable errors other n a print head temperature error.		

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	Specification (STANDARD)	С	NEXT 55	SHEET 54

• DLE ENQ 3 is available only when the printer is waiting for the insertion of cut sheet, and is ignored in other states. Therefore, before executing **DLE ENQ 3**, be sure to use **DLE EOT 5** or **DLE EOT 6** to check whether cut sheet is selected and the printer is in the cut sheet waiting state. After the printer is released from the cut sheet waiting state, the paper roll is selected.

- When the cut sheet waiting state is canceled by **DLE ENQ 3**, the data in the receive and print buffers is cleared.
- DLE ENQ 1 and DLE ENQ 2 are enabled, even if the printer is canceled by ESC =.
- If *n* is out of the specified range, this command is ignored.

[Reference] DLE EOT

Appendix I, Example Print Control for Cut Sheets

#### CAN

[Name]	Cancel print data in page mode
[Format]	<18>H
[Description]	In page mode, deletes all the print data in the current printable area.
[Notes]	<ul> <li>This command is enabled only in page mode.</li> </ul>
	<ul> <li>If data that existed in the previously specified printable area also exists in the currently specified printable area, it is deleted.</li> </ul>
Deferencel	ESC W

[Reference] ESC W

EPSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	С	NEXT 56	SHEET 55

# ESC SP n

[Name] [Format]	Set right-side character spacing
[Range]	0 < n < 255
[Description]	Sets the right-side character spacing using the fundamental calculation nitch
[Becenbrion]	The right side character spacing is set to $[n \times (fundamental calculation pitch)].$
[Notes]	• When $[n \times (fundamental calcualtion pitch)]$ is 0.2 inches or less, the setting is effective.
	• The right-side character spacing for double-width mode is twice the normal value.
	• For standard and page modes, this command sets values independently in each mode.
	<ul> <li>In standard mode, this command uses the horizontal direction fundamental calculation pitch.</li> </ul>
	<ul> <li>In page mode, the fundamental calculation pitch depends on the printing direction specified by ESC T, as follows:</li> </ul>
	If <b>ESC T</b> <i>n</i> = 0 or 2, this command uses the horizontal direction fundamental calculation pitch.
	If <b>ESC T</b> <i>n</i> = 1 or 3, this command uses the vertical direction fundamental calculation pitch.
	• This command is ignored when $[n \times (fundamental calculation pitch)]$ is more than 32/160 inches.
[Default]	<i>n</i> = 0
[Reference]	GS P

EPSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	С	NEXT 57	SHEET 56

#### ESC ! *n*

[Name]	Select print mode(s)
[Format]	<1B>H<21>H< <i>n</i> >
[Range]	0 ≤ <i>n</i> ≤ 255
[Description]	Selects print mode(s)

[Description] Selects print measure.
 The bits of *n* select various modes as follows:

Dit	Function	Value		
	Function	0	1	
1	Character font	$5 \times 9$ font	$7 \times 9$ font	
2	Undefined			
3	Undefined			
4	Emphasized	Canceled	Selected	
5	Double-height	Canceled	Selected	
6	Double-width	Canceled	Selected	
7	Undefined			
8	Underlined	Canceled	Selected	

# [Notes] • Underlines can be printed for all characters, but not for the space set by **HT**, 90° clockwise rotated characters, and space set by **ESC \$** or **ESC** \.

- When both double-height mode and double-width mode are set, quadruple-size characters are printed.
- Bidirectional printing may cause printing position misalignment between the upper and lower halves of the characters during double-height printing. Therefore, unidirectional printing is recommended (use **ESC U**) in this case.
- When using this command in page mode, the 7 × 9 font and emphasized mode settings are possible but are not executed actually.

[Default] n = 1

[Reference] ESC -, ESC E

EPSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	С	NEXT 58	SHEET 57

# ESC \$ nL nH

[Name]	Set absolute print position
[Format]	<1B>H<24>H< <i>nL</i> >< <i>nH</i> >
[Range]	$0 \le nL \le 255$ $0 \le nH \le 255$
[Description]	Sets the distance for starting printing from the beginning of the line, in the fundamental calculation pitch.
	• The distance (in inches) from the beginning of the line is calculated by the formula $[(nL + nH \times 256) \times (fundamental calculation pitch)].$
[Notes]	<ul> <li>Any value that falls outside the printable area is ignored.</li> </ul>
	• When the left margin is set, the printable area width begins at [(left margin) + 1] dots.
	<ul> <li>In standard mode, this command uses the horizontal direction fundamental calculation pitch.</li> </ul>
	<ul> <li>In page mode, the calculation pitch differs depending on the printing direction specified by ESC T, as follows:</li> </ul>
	If <b>ESC T</b> <i>n</i> = 0 or 2, this command uses the horizontal direction fundamental calculation pitch.
	If <b>ESC T</b> <i>n</i> = 1 or 3, this command uses the vertical direction fundamental calculation pitch.
	• When DIP SW 2-2 is off, the entire printable area is set to 400/160 inches. When DIP SW 2-2 is on, the entire printable area is set to 385/160 inches. This area can be set to the maximum of 400/160 inches by using <b>GS L</b> and <b>GS W</b> .
[Reference]	ESC  GS P
	Appendix J, Notes on Number of Printable Columns

EPSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	С	NEXT 59	SHEET 58

# ESC % *n*

[Name] [Format]	Select/cancel user-defined character set <1B>H<25>H< <i>n</i> >
[Range]	$0 \le n \le 255$
[Description]	Selects or cancels the user-defined character set.
	<ul> <li>Only the lowest bit of n is effective.</li> </ul>
	When $n = <******0>B$ , the user-defined character set is canceled (internal character set is selected).
	When $n = < ** * * * 1 > B$ , the user-defined character set is selected.
[Note]	A user-defined character set and a down-loaded bit image cannot be defined simultaneously.
[Default]	<i>n</i> = 0
[Reference]	ESC &, ESC ?

EPSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	С	NEXT 60	SHEET 59

# ESC & y c1 c2 [x [p] y × x]c2 - c1 + 1

[Name]	Define user-defined characters
[Format]	<1B>H<26>H <y><c1><c2>[<x><p1><p2><py x="" ×="">] c2 - c1 + 1</py></p2></p1></x></c2></c1></y>
[Range]	y = 2 $32 \le c1 \le c2 \le 126$ $0 \le x \le 6 (5 \times 9 \text{ font})$ $0 \le x \le 10 (7 \times 9 \text{ font})$ $0 \le p1py \times x \le 255$
[Description]	Defines user-defined alphanumeric and katakana characters for the specified character codes.
	<ul> <li>y specifies the number of bytes in the vertical direction.</li> </ul>
	<ul> <li>c1 specifies the beginning character code and c2 specifies the final code.</li> <li>To define only one character, use c1 = c2</li> </ul>
	<ul> <li>The allowable character code range is from ASCII code &lt;20&gt;H to &lt;7E&gt;H, 95 characters in all.</li> </ul>
	• x specifies the number of dots in the horizontal direction.
	• <i>p</i> is the dot data for the characters. The dot pattern is in the horizontal direction from the left side for <i>x</i> dots. Any remaining dots on the right side are blank.
[Notes]	<ul> <li>After user-defined characters are defined, they remain effective until: another definition is made, ESC @ or GS * is executed, the printer is reset, or the power is turned off.</li> </ul>
	- In 7 $ imes$ 9 font, horizontally adjacent dots cannot be printed.
	<ul> <li>In the second data byte in the vertical direction, only the top bit is valid.</li> </ul>
	<ul> <li>A user-defined character set and a down-loaded bit image cannot be defined simultaneously. If this command is executed, the down-loaded bit image is cleared.</li> </ul>
	• When the value of y, c1, c2, or x is out of the range, this command is ignored, and the following data is processed as normal data.
[Default]	The same pattern as the internal character set.
[Reference]	ESC %, ESC ?

EPSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	С	NEXT 61	SHEET 60

#### [Example]



•  $7 \times 9$  font when the dot pattern for code 20H is define as shown below:

ESC & y c1 c2 x p1 p2 p3 p4 p5 p6 p7 p8 p9 p10 p11 p12 p13 p14 Code (Hexadecimal) 1B 26 02 20 20 07 1F 80 20 00 44 00 80 00 44 00 20 00 1F 80 The corresponding bit is 1 to print a dot and 0 to not print a dot.

EPSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	С	NEXT 62	SHEET 61

#### ESC \* m nL nH [d] nL + 256 × nH

[Name]	Select bit-image mode
[Format]	<1B>H<2A>H< <i>m</i> >< <i>nL</i> >< <i>nH</i> >[< <i>d</i> >] <i>nL</i> + 256 × <i>nH</i>
[Range]	<i>m</i> = 0, 1
	$0 \leq nL \leq 255$
	$0 \le nH \le 3$
	$0 \le d \le 255$

- [Description] Selects a bit-image mode m for the number of dots specified by *nL* and *nH* 
  - The number of horizontal dots is nL + 256  $\times$  nH.
  - If the bit-image data input exceeds the number of dots to be printed on a line, the excess data is ignored.
  - *d* indicates the bit-image data. Set a corresponding bit to 1 to print a dot or to 0 to not print a dot.
  - The bit-image modes selectable by *m* are as follows:

		Horizontal Direction		
т	Vertical Dots	Dat Danaity	Adjacent Dot	Total Number of Dots in
		Dot Density	Specification	Standard Mode
0	8	Single-density	Permitted	200 (*)
1	8	Double-density	Prohibited	400

<sup>(\*)</sup> The total number of horizontal dots in page mode depends on the printable area specified by ESC W and the printing direction specified by ESC T.

[Notes] • In page mode, double-density bit image is disabled.

> • When m or nH is out of the specified range, this command is ignored and the following data is processed as normal data.

> > Bit-image data

- After printing a bit image, the printer returns to normal data processing mode.
- The relationship between the image data and the dots to be printed is as follows:





EPSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	С	NEXT 63	SHEET 62

# ESC – *n*

[Name]	Turn underline mode on/off
[Format]	<1B>H<2D>H< <i>n</i> >
[Range]	<i>n</i> = 0, 1, 48, 49
[Description]	Turns underline mode on or off.
	• When $n = 0$ or 48, underline mode is turned off.
	• When $n = 1$ or 49, underline mode is turned on.
[Notes]	<ul> <li>Underlines can be printed for all characters, but not for the space set by HT, 90° clockwise-rotated characters, and the space set by ESC \$ or ESC \.</li> </ul>
	<ul> <li>This command and ESC ! turn underline mode on or off in the same way.</li> </ul>
	• When <i>n</i> is out of the specified range, this command is ignored.
[Default]	<i>n</i> = 0
[Reference]	ESC !

### ESC 2

[Name]	Set 1/6-inch line spacing
[Format]	<1B>H<32>H
[Description]	Sets the line spacing to 1/6 inch.
[Notes]	<ul> <li>This command is enabled only for paper selected by ESC c 1.</li> </ul>
	• For standard and page modes, this command sets values independently in each mode.
[Reference]	ESC 3, ESC c 1

EPSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	С	NEXT 64	SHEET 63

# ESC 3 n

[Name]	Set line spacing
[Format]	<1B>H<33>H <n></n>
[Range]	$0 \le n \le 255$
[Description]	Sets the line spacing to the [ $n \times$ (fundamental calculation pitch)].
[Note]	<ul> <li>This command is enabled only for paper selected by ESC c 1.</li> </ul>
	• For standard and page modes, this command sets values independently in each mode.
	<ul> <li>In standard mode, this command uses the vertical direction fundamental calculation pitch.</li> </ul>
	<ul> <li>In page mode, the calculation pitch differs depending on the printing direction specified by ESC T, as follows:</li> </ul>
	If <b>ESC T <i>n</i> =</b> 0 or 2, this command uses the vertical direction fundamental calculation pitch.
	If <b>ESC T</b> <i>n</i> = 1 or 3, this command uses the horizontal direction fundamental calculation pitch.
[Default]	<i>n</i> = 24 (1/6 inch)
[Reference]	ESC 2, ESC c 1, GS P

### ESC <

[Name] [Format]	Return home <1B>H<3C>H
[Description]	Moves the print head to the standby position
[Notes]	<ul> <li>The print head first moves to the left-most position, then to the right-most position, and then to approximately the center of the line.</li> </ul>
	<ul> <li>The left-most position is detected by the home position sensor.</li> </ul>
	<ul> <li>Since the home position is detected when this command is executed, the printing position may shift afterwards.</li> </ul>
	<ul> <li>When using a cut sheet that is narrower than the carriage movement range, never turn the power off and open the cover, transmit the return home command (ESC&lt;) or reset the machine with the interface after putting the printer into cut sheet mode and inserting a cut sheet.</li> <li>Allowing the carriage to move from the home position across the edge of the paper may cause a paper jam.</li> </ul>

EDSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
EFSUN	Specification (STANDARD)	D	NEXT 64-2	SHEET 64-1

- The cut sheet waiting state can be canceled by the **DLE ENQ 3** command.
- Use the ASB function to correctly determine the paper state. (See Appendix I, *Example Print Control for Cut Sheets.*)

EDSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
EFSUN	Specification (STANDARD)	D	NEXT 65	SHEET 64-2

#### ESC = *n*

<1B>H<3D>H< <i>n</i> >						
$0 \le n \le 3$						
llowing table	, based	on the v	alue of			
Va	lue					
0	1					
Canceled	Selec	ted				
Canceled	Selec	cted				
out executes his comman to manual p	nothing d. rinter op	(except eration.	t for <b>DLE</b> (See			
nection)	n					
	2					
	-					
When executing ESC @:						
ues specified , as follows:	by <b>ESC</b>	= (just	before			
		п				
	1	2	3			
display direct	1	2(*)	2			
display dired	t 1	2(*)	1			
	Ilowing table Va 0 Canceled Canceled Canceled out executes his comman to manual p nection)	Ilowing table, based         Value         0       1         Canceled       Select         Canceled       Select         Canceled       Select         Canceled       Select         Canceled       Select         Dut executes nothing         his command.         to manual printer option         nection)       n         1         nes specified by ESC         as follows:         1         lisplay direct       1         display direct       1	Ilowing table, based on the value         0       1         Canceled       Selected         Canceled       Selected         Canceled       Selected         Canceled       Selected         Description       Image: Selected         Description       Image: Selected         Description       Image: Selected         Description       Image: Selected         Image: Selected       Image: Selected         Image: Selected			

(\*) The printer does not process **ESC** @, as it is canceled. Therefore, the setting of **ESC** = does not change.

[Reference] Section 3.3.4, DIP switches

EPSON	TM-U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	С	NEXT 66	SHEET 65

connection)

# ESC ? n

[Name]	Cancel user-defined characters
[Format]	<1B>H<3F>H< <i>n</i> >
[Range]	$32 \le n \le 126$
[Description]	Cancels the specified user-defined characters
[Notes]	<ul> <li>This command cancels the pattern defined for character code n of the selected font size. After a user-defined character is canceled, the corresponding built-in pattern is printed.</li> </ul>
	<ul> <li>If a user-defined character has not been defined for the specified character code, the printer ignores this command.</li> </ul>
	<ul> <li>If n is out of the specified range, this command is ignored.</li> </ul>
[Reference]	ESC &, ESC %

### ESC @

[Name]	Initialize printer
[Format]	<1B>H<40>H
[Description]	Clears the data in the print buffer and resets the printer mode to the mode that was in effect when the power was turned on.
[Notes]	<ul> <li>The DIP switches are not read again.</li> </ul>
	<ul> <li>The data in the receive buffer is not cleared.</li> </ul>
	• If cut sheet has been selected, the printer ejects the cut sheet and switches from cut sheet mode to paper roll mode.

EPSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	с	NEXT 67	SHEET 66

### ESC C n

[Name]	Set cut sheet eject length
[Format]	<1B>H<43>H< <i>n</i> >
[Range]	$0 \le n \le 255$
[Description]	Sets the eject length for cut sheet to <i>n</i> lines.
	<ul> <li>When n = 0, no eject length setting is performed</li> </ul>
[Notes]	<ul> <li>This command sets the eject length for the cut sheet selected by ESC c 1.</li> </ul>
	<ul> <li>The specified eject length does not change even if the line spacing changes.</li> </ul>
	<ul> <li>The maximum eject length that can be set is 40 inches. When [n × line spacing] exceeds 40 inches, the eject length is automatically set to 40 inches.</li> </ul>
	<ul> <li>The eject length set by this command is effective only when FF is executed in standard mode.</li> </ul>
[Default]	<i>n</i> = 0
[Reference]	FF, ESC 2, ESC 3, ESC c 1

EPSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	С	NEXT 68	SHEET 67

# ESC D [n]k NUL

[Name]	Set horizontal tab positions
[Format]	<1B>H<44>H[< <i>n</i> >] <i>k</i> <00>H
[Range]	$1 \le n \le 255$ $0 \le k \le 32$
[Description]	Sets horizontal tab positions.
	<ul> <li><i>n</i> specifies the column number (counted from the beginning of the line) for setting a horizontal tab position (<i>n</i> = tab position - 1). For example, if a tab is to be set at the 9th column, <i>n</i> should be 8.</li> </ul>
	• k indicates the total number of horizontal tab positions to be set.
	<ul> <li>The tab position is set at [character width × n] from the beginning of the line. The character width includes the right-side space of the character, and is twice the normal value when double-width is specified.</li> </ul>
	<ul> <li>Input <n>k in ascending order and place a NUL code &lt;00&gt;H at the end.</n></li> </ul>
	<ul> <li>ESC D NUL clears all the tab positions. An HT sent after the positions have been cleared will be ignored.</li> </ul>
[Notes]	<ul> <li>When <n>k is less than or equal to the preceding value <n>k-1, tab setting is finished and the following data is processed as normal data.</n></n></li> </ul>
	<ul> <li>Up to 32 tab positions can be set. Data exceeding 32 tab positions is processed as normal data.</li> </ul>
	• When < <i>n</i> > <i>k</i> exceeds the number of characters printable on one line, the tab position set is equal to the maximum printable column plus 1.
	<ul> <li>The specified horizontal tab positions do not change even if the character widths change.</li> </ul>
	<ul> <li>There are two types of right-side character spacing. One is for standard mode, and the other is for page mode. When the printer is in standard mode, use the right-side character spacing for standard mode to set horizontal tab positions. In the same manner, when the printer is in page mode, use the right-side character spacing for page mode.</li> </ul>
[Default]	The default tab positions are at intervals of 8 characters (columns 9, 17, 25,) for the $7\times$ 9 character font.
[Reference]	HT

EPSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	С	NEXT 69	SHEET 68

# ESC E n

[Name]	Turn emphasized mode on/off
[Format]	<1B>H<45>H< <i>n</i> >
[Range]	$0 \le n \le 255$
[Description]	Turns emphasized mode on or off
	<ul> <li>Only the lowest bit of n is effective.</li> </ul>
	When <i>n</i> = <******0>B, emphasized mode is turned off. When <i>n</i> = <******1>B, emphasized mode is turned on.
[Notes]	<ul> <li>Printing speed decreases in emphasized mode because two-pass printing is performed.</li> </ul>
	<ul> <li>The printer does not emphasize bit-images and down-loaded bit images.</li> </ul>
	<ul> <li>In page mode, only the command setting is enabled.</li> </ul>
	• This command functions in the same way as <b>ESC</b> !. Therefore, when both commands are used, their settings should be identical.
[Default]	<i>n</i> = 0
[Reference]	ESC !

### ESC G n

[Name]	Turn double-strike mode on/off
[Format]	<1B>H<47>H< <i>n</i> >
[Range]	$0 \le n \le 255$
[Description]	Turns double-strike mode on or off
	<ul> <li>Only the lowest bit of n is enabled.</li> </ul>
	When <i>n</i> = <******0>B, turns off double-strike mode. When <i>n</i> = <******1>B, turns on double-strike mode.
[Notes]	<ul> <li>Printer output is the same in double-strike mode and in emphasized mode.</li> </ul>
	<ul> <li>The printer does not double-strike for bit-images and down-loaded bit images.</li> </ul>
	<ul> <li>In page mode, only the command setting is enabled.</li> </ul>
[Default]	<i>n</i> = 0
[Reference]	ESC E

EPSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	С	NEXT 70	SHEET 69

# ESC J n

[Name] [Format]	Print and feed paper <1B>H<4A>H< <i>n</i> >
[Range]	$0 \le n \le 255$
[Description]	Prints the data in the print buffer and feeds the paper by $n/60$ inches [ $n \times$ (fundamental calculation pitch)].
	<ul> <li>Sets the print starting position to the beginning of the line.</li> </ul>
[Notes]	• The maximum paper feed amount that can be specified is 40 inches. If a larger value is specified, only 40 inches are fed.
	<ul> <li>In standard mode, this command uses the vertical direction fundamental calculation pitch.</li> </ul>
	<ul> <li>In page mode, the calculation pitch depends on the printing direction specified by ESC T, as follows:</li> </ul>
	If <b>ESC T</b> <i>n</i> = 0 or 2, this command uses the vertical direction fundamental calculation pitch.
	If <b>ESC T</b> <i>n</i> = 1 or 3, this command uses the horizontal direction fundamental calculation pitch.
	<ul> <li>When printing on the paper roll includes paper feeding of more than 8.5 mm (48/144 inches), printing speed may be slower because of carriage movement prior to paper feeding.</li> </ul>
[Reference]	GS P

EPSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	С	NEXT 71	SHEET 70

# ESC L

[Name]	Select page mode		
[Format]	<1B>H<4C>H		
[Description]	Switches from standard mode to page mode.		
	<ul> <li>Page mode develops the data received in the specified printable area and collectively prints the data in the area when the FF command is given. Therefore, print commands (such as LF) are developed in printer memory but are not actually executed.</li> </ul>		
	<ul> <li>When an FF command is given, the data in the specified printable area is printed and the printer then returns to standard mode.</li> </ul>		
[Notes]	<ul> <li>This command is enabled only when input at the beginning of a line.</li> </ul>		
-	<ul> <li>In page mode, half-dots cannot be used. Therefore, be careful with any command setting that uses half-dots. (See Section 3.14.2, Page mode limitations)</li> </ul>		
	< Setting ESC SP >		
	<b>ESC SP</b> sets values independently in standard mode and in page mode.		
	< Character generation >		
	Only fonts containing normal dots are usable.		
	<when is="" mode="" page="" selected=""></when>		
	Only setting is possible for the following command functions:		
	<b>ESC</b> ! Select 7 × 9 font and emphasize		
	ESC   Specify double-density bit image		
	ESC E Specify emphasizing		
	ESC G Specify double printing		
	<b>ESC V</b> Turn 90° clockwise character rotation on/off		
	ESC a Align text position		
	ESC { Specify upside-down characters		
	GS / Printing double-density downloaded bit image		
	GSL Set left margin		
	The following command functions are dischlad:		
	$\mathbf{FSC} = 0$		
	<b>ESC t</b> Double density bit image specification		
	<b>GS</b> Double-density downloaded bit image printing		
	This command is enabled only in standard mode		
[Defaulte]	Standard mode		
Referencel	FF		
	Appendix H, Example Printing in Page Mode		

EPSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	С	NEXT 72	SHEET 71

### ESC R n

[Name]	Select an international character set
[Format]	<1B>H<52>H< <i>n</i> >
[Range]	$0 \le n \le 10$

[Description] Selects an international character set *n* from the following table:

n	Country
0	U.S.A.
1	France
2	Germany
3	U.K.
4	Denmark I
5	Sweden
6	Italy
7	Spain
8	Japan
9	Norway
10	Denmark II

[Note] If *n* is outside of the specified range, this command is ignored.

[Default] n = 0

[Reference] Section 3.2.9, International Character Set

EPSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	С	NEXT 73	SHEET 72

### ESC T n

[Name] [Format]	Select print direction in page mode <1B>H<54>< <i>n</i> >
[Range]	$0 \le n \le 3, 48 \le n \le 51$
[Description]	Selects the printing direction and print starting position in page mode.
	<i>n</i> specifies the print direction and starting position as follows:
	$n = 0$ 48: $\rightarrow$ (print starting position is A)
	$n = 1$ 49: $\uparrow$ (print starting position is B)
	n = 1, 49 (print starting position is D)
	$n = 2, 50$ : $\leftarrow$ (print starting position is C)
	$n = 3, 51$ : $\downarrow$ (print starting position is D)
	$\land \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \qquad \qquad \forall$
	· · · · · · · · · · · · · · · · · · ·
	↓ Printable area ↓   ਦੁੱਚ
[Notes]	• When the printing position is specified or changed in specifies the printing

- When the printing position is specified or changed, n specifies the printing direction for subsequent characters and starting position A, B, C, or D.
  - In standard mode, only the command setting is available.
  - If *n* is out of the specified range, this command is ignored.
- [Default]

*n* = 0

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# ESC U n

[Name] [Format]	Turn unidirectional printing mode on/off <1B>H<55>H< <i>n</i> >
[Range]	0 ≤ <i>n</i> ≤ 255
[Description]	Turns unidirectional printing mode on or off
	• Only the lowest bit of <i>n</i> is enabled.
	When <i>n</i> = <******0>B, unidirectional printing is turned off (and bidirectional printing is selected). When <i>n</i> = <******1>B, tunidirectional printing is turned on.
[Notes]	<ul> <li>When unidirectional printing is specified, the printer prints from left to right.</li> </ul>
	<ul> <li>To avoid horizontal misalignment for certain types of printing (double-height, ruled lines, down-loaded bit image, page mode, etc.), unidirectional printing should be used.</li> </ul>
[Default]	In standard mode, $n = 0$
	In page mode, <i>n</i> = 1

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### ESC V n

[Name]	Turn 90 clockwise rotation mode on/off
[Format]	<1B>H<56>H< <i>n</i> >
[Range]	$0 \le n \le 2, \ 48 \le n \le 50$
[Description]	Turns 90° clockwise rotation mode on or off.
	<i>n</i> is used as follows:
	n Function
	0, 48 Turn off 90° clockwise rotation mode
	1, 49 Turn off 90° clockwise rotation mode (1-dot character spacing)
	2, 50 Turn off 90° clockwise rotation mode (1.5-dot character spacing)
[Notes]	- Characters are rotated only when the 5 $ imes$ 9 font is selected.
	• When the $7 \times 9$ font is selected, characters cannot be rotated. 90° clockwise rotation mode can be set, however.
	• When 90° clockwise rotatation mode is selected, and then the $7 \times 9$ font is selected, the following characters are printed in the $7 \times 9$ font but are not rotated.
	<ul> <li>Characters with 90° clockwise rotation specified cannot be underlined. Underlining can be set, however.</li> </ul>
	<ul> <li>If this function is on, a character in double-width mode is printed as a double- height character. In the same manner, a character in double-height mode is printed as a double-width character.</li> </ul>
	• When <i>n</i> is out of the specified range, this command is ignored.
	<ul> <li>In page mode, only the command setting is enabled.</li> </ul>
[Default]	<i>n</i> = 0
[Reference]	ESC SP, ESC !, GS P
[Examples]	
	• $n = 1$ , right-side character spacing is 2/160 inches.
	n = 2



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#### ESC W xL xH .... dyH

[Name] [Format]	Set printing area in page mode <1B>H<57>H <i><xl><xh></xh></xl></i> < <i>yL&gt;</i> < <i>yH</i> >< <i>dxL&gt;</i> < <i>dyH</i> >
[Range]	$\begin{array}{ll} 0 \leq xL \leq 255, & 0 \leq xH \leq 255, & 0 \leq yL \leq 255, & 0 \leq yH \leq 255 \\ 0 \leq dxL \leq 255, & 0 \leq dxH \leq 255, & 0 \leq dyL \leq 255, & 0 \leq dyH \leq 255 \end{array}$
[Description]	Sets the print starting position to the upper left (x0, y0), the length in the y direction (paper feeding direction) to dy inches, and the length in the x direction to dx inches, as follows:
	$x0 = [(xL + xH * 256) \times (horizontal direction fundamental calculation pitch)]$
	$y_0 = [(y_L + y_H * 256) \times (vertical direction fundamental calculation pitch)]$
	$dx = [(dxL + dxH * 256) \times (horizontal direction fundamental calculation pitch)]$
	$dv = [(dv_l + dv_H * 256) \times (vertical direction fundamental calculation pitch)]$
	(0, 0)
	(0X, 0Y) Printable area of paper
	↓ dx
	dy Printing area
	(400/160 inches, 1408/144 inches)

- [Notes] If a printing area that extends beyond the maximum is specified, the maximum area is automatically used based upon the effective values from *xL* to *dyH*.
  - Be aware that the fundamental calculation pitch depends on the vertical or horizontal direction.
  - The maximum printable area in the x direction is 400/160 inches.
  - The maximum printable area in the y direction is 1408/144 inches.
  - If dx exceeds 400/160 inches, the printable area in the x direction is automatically set to 400/160 inches. If dy exceeds 1408/144 inches, the printable area in the y direction is set to 1408/144.
  - Both dx and dy require 9 dots or more to develop data in the specified printing area.
  - Set the printable area so that it accommodates the selected paper .
  - In standard mode, only the command setting is enabled.

[Default] xL = xH = yL = yH = 0

dxL = 144, dxH = 1, dyL = 128, dyH = 5

[Reference] CAN, ESC L, ESC T, GS P

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# **ESC ∖** *п***∟** *п***н**

[Name]	Set relative print position
[Format]	<1B>H<5C>H< <i>nL</i> >< <i>nH</i> >
[Range]	$0 \le nL \le 255$ $0 \le nH \le 255$
[Description]	Sets the print starting position based on the current position, in fundamental calculation pitch.
	<ul> <li>A positive number specifies movement to the right, and a negative number specifies movement to the left.</li> </ul>
	• Pitch <i>N</i> in the positive direction (right) is calculated as $[nL + nH \times 256]$ . To specify pitch <i>N</i> in the negative direction (left), use the complement of <i>N</i> as follows:
	$nL + nH \times 256 = 65535 - N$
	• The print starting position becomes $[N \times (fundamental calculation pitch)]$ inches from the current position.
[Notes]	<ul> <li>Specification of the print starting position beyond the beginning or end of a line, the printing area width, or the left margin is ignored.</li> </ul>
	<ul> <li>When the left margin is set, the printable area width begins at [(right edge of the left margin) + 1].</li> </ul>
	<ul> <li>In standard mode, this command uses the horizontal direction fundamental calculation pitch.</li> </ul>
	<ul> <li>In page mode, the fundamental calculation pitch depends on the printing direction specified by ESC T, as follows:</li> </ul>
	If <b>ESC T <i>n</i> =</b> 0 or 2, this command uses the horizontal direction fundamental calculation pitch.
	If <b>ESC T <i>n</i> =</b> 1 or 3, this command uses the vertical direction fundamental calculation pitch.
	<ul> <li>When DIP SW 2-2 is OFF, the entire printable area is set to 400/160 inches. When DIP SW 2-2 is ON, the entire printable area is set to 385/160 inches. This area is set to maximum of 400/160 inches by using GS L and GS W.</li> </ul>
[Reference]	ESC \$, GS P
	Appendix J, Notes on Number of Printable Columns

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### ESC a n

ABCDE

[Name]	Select jus	tification						
[Format]	<1B>H<61>H< <i>n</i> >							
[Range]	$0 \le n \le 2$ ,	48 ≤ <i>n</i> ≤ 50						
[Description]	Aligns all f	the data in o	ne	line to the s	pecified po	siti	on	
	<i>n</i> selects t	the justificati	on	as follows:				
	n	Justi	fica	ation	]			
	0, 48	Left justific	atic	on				
	1, 49	Centering						
	2, 50	Right justif	ical	tion				
[Notes]	<ul> <li>This cor</li> </ul>	nmand is en	ab	led only whe	en input at l	the	beginning of a line.	
	• Any blar ( <b>HT</b> ) is a	nk part of a l also justified	ine	occurring a	ifter a positi	iona	al designation ( <b>ESC \$</b> o	r <b>ESC ∖</b> ) or tab
	• If <i>n</i> is ou	ut of the spe	cifie	ed range, th	is comman	d is	s ignored.	
[Default]	<i>n</i> = 0							
[Example]								
	Left justifi	cation		Centering			Right justification	
	ABC			AB	3C		ABC	
	ABCD			AB	CD		ABCD	

ABCDE

ABCDE

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#### ESC c 0 *n*

[Notes]

[Name]	Select print paper(s)
[Format]	<1B>H<63>H<30>H <i>&lt;</i> n>

[Range]  $1 \le n \le 11$ 

[Description] Selects the type(s) of paper for printing.

The bits of *n* are as follows:

Bit	Function	Value		
DIL	FullCuoli	0	1	
0	Paper roll	Disabled	Freeblad	
1		Disabled	Enabled	
2	Slip	Disabled	Enabled	
3	Validation	Disabled	Enabled	
4	Undefined			
5	Undefined			
6	Undefined			
7	Undefined			

#### This command is effective only at the beginning of a line.

• This command operates as follows:

- ① If the paper roll is selected, with slip or validation paper having been previously selected, the slip or validation paper is ejected.
- ② If validation is selected, with slip having been previously selected, the slip paper is ejected and the printer waits for validation paper.
- ③ If slip is selected, with validation having been previously selected, the validation paper is ejected and the printer waits for slip paper.
- ④ If slip or validation is selected, with the paper roll having been previously selected, the printer waits for the slip or validation paper to be inserted.
- ⑤ If the previously selected paper is selected again, no operation takes place.
- If either bit 0 or 1 is set to 1, the paper roll is selected.
- When both cut sheet and the paper roll are selected at the same time, printing on the paper roll is possible only if pressure-sensitive paper is used.
- When *n* is out of the specified range, this command is ignored.
- In page mode, this command is disabled.

[Default]

*n* = 1

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#### ESC c 1 *n*

[Name]	Select paper(s)	for settings
--------	-----------------	--------------

[Format] <1B>H<63>H<31>H<n>

[Range]  $1 \le n \le 15$ 

[Description] Selects paper type(s) for use with the following command settings:

- ESC 2 and ESC 3 set the line spacing for the selected paper.
- ESC C sets the eject length for cut sheet.
- **GS L** sets the left margin for the selected paper.
- **GS W** sets the printable area width for the selected paper.
- The bits of *n* are defined as follows:

Dit	Function	Value		
ы	Function	0	1	
0	Banar roll	Dischlod	Frablad	
1		Disabled	Enabled	
2	Slip	Disabled	Enabled	
3	Validation	Disabled	Enabled	
4	Undefined			
5	Undefined			
6	Undefined			
7	Undefined			

[Notes] If different line spacings are set for paper roll and cut sheet, and both the paper roll and cut sheet are selected for printing by ESC c 0, printing, paper feeding via the PAPER FEED button, settings for the left margin and printable area width are based on the line spacing set for cut sheet.

- If either bit 0 or 1 is 1, the paper roll is selected for setting values.
- If *n* is out of the specified range, this command is ignored.
- [Default] *n* = 15
- [Reference] ESC 2, ESC 3, ESC C, GS L, GS W

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#### ESC c 3 n

[Name]	Select paper sensor(s) to output paper end signals
[Format]	<1B>H<63>H<33>< <i>n</i> >
[Range]	$0 \le n \le 255$

[Description] Selects the paper sensor(s) to output paper end signals.

• Each bit of *n* is used as follows:

Dit	Eurotion	Value		
ы	Function	0	1	
0	Depart roll poor and concer	Dischlad	Enchlad	
1	Paper roll near end sensor		Enabled	
2	Undefined			
3	Undefined			
4				
5	Cut chect concer	Disabled	Enabled	
6	Cut sneet sensor			
7				

[Notes] • It is possible to select multiple sensors to stop printing. If any of the selected sensors detects a paper-end, the paper end signal is output.

- The sensor is switched when this command is executed. By this switching, the command reception and paper-out signal switching are delayed depending on the status of receive buffer.
- If either bit 0 or bit 1 is 1, the paper roll near end sensor is selected as a paper end sensor that is enabled to output paper end signal.
- If any of bits 4 ~ 7 are 1, the cut sheet sensor is selected as a paper end sensor that is enabled to output paper end signal.
- This command is only effective with the parallel interface model and is ignored by the serial interface model.

[Default]

*n* = 3

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#### ESC c 4 *n*

[Name]	Select paper sensor(s) to stop printing
[Format]	<1B>H<63>H<34>H< <i>n</i> >
[Range]	0 ≤ <i>n</i> ≤ 255

[Description] Selects the paper sensor(s) used to stop printing when paper-end is detected The bit of *n* is used are defined as follows:

Dit	Eurotion	Value		
	Function	0	1	
0	Paper roll near-end	Disabled	Enabled	
1				
2	Undefined			
3	Undefined			
4	Undefined			
5	Cut sheet (detects slip ejection)	Disabled	Enabled	
6	Undefined			
7	Cut sheet (detects validation ejection)	Disabled	Enabled	

# [Notes] • When a paper sensor is enabled with this command, printing is stopped only when the corresponding paper is selected for printing.

- It is possible to select multiple sensors to stop printing. If any of the selected sensors detects a paper-end, the printer stops printing.
- Printing stops after printing the current line and feeding the paper.
- When DIP switch 2-3 is off and the paper roll sensor detects a paper-end, the printer goes off-line after printing stops.
- When the cut sheet sensor is enabled and the printer finds that there is not enough paper for next print instruction (after printing as much as possible), it ejects the paper and enters the paper waiting state.
- If either bit 0 or 1 is 1, the paper roll near-end sensor is enabled to stop printing.
- [Default]

n = 0

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# ESC c 5 *n*

[Name] [Format]	Enable/disable panel buttons <1B>H<63>H<35>< <i>n</i> >
[Range]	$0 \le n \le 255$
[Description]	Enables or disables the panel buttons.
	• Only the lowest bit <i>n</i> is effective.
	When <i>n</i> = <******0>B, the panel switches are enabled. When <i>n</i> = <******1>B, the panel switches are disabled.
[Note]	<ul> <li>When the panel buttons are disabled, none of them are usable (when the cover is closed).</li> </ul>
	• When the cover is open the button state is as follows, regardless of this command:
	PAPER FEED button disabled.
	RELEASE button enabled.
[Default]	<i>n</i> = 0

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# ESC d n

[Name]	Print and feed <i>n</i> lines		
[Format]	<1B>H<64>H< <i>n</i> >		
[Range]	$0 \le n \le 255$		
[Description]	Prints the data in the print buffer and feeds <i>n</i> lines.		
[Notes]	<ul> <li>Sets the print starting position to the beginning of the line.</li> </ul>		
	<ul> <li>This command does not change the line spacing set by ESC 2 or ESC 3.</li> </ul>		
	<ul> <li>When printing on the paper roll includes paper feeding of more than 8.5 mm (48/144 inches), printing speed may be slower because of carriage movement prior to paper feeding.</li> </ul>		
	<ul> <li>The maximum paper feed amount is 40 inches. If [n × line spacing] exceeds 40 inches, the paper is fed only 40 inches.</li> </ul>		
[Reference]	ESC 2, ESC 3		

#### ESC f *t1 t2*

[Name] [Format]	Set cut sheet wait time <1B>H<66>H< <i>t</i> 1>< <i>t</i> 2>		
[Range]	$\begin{array}{l} 0 \leq t1 \leq 15 \\ 0 \leq t2 \leq 64 \end{array}$		
[Description]	Sets the time the printer waits for cut sheet to be inserted and the time from when the cut sheet is inserted to when the printer starts operation.		
	• This command sets the cut sheet waiting time to $t1 \times 1$ minutes. If cut sheet is not detected within this time, the printer cancels cut sheet mode and selects the paper roll.		
	<ul> <li>When t1 is set to 0, the printer waits until cut sheet is inserted.</li> </ul>		
	• The printer starts operation 0.1 $ imes$ t2 seconds after detecting paper.		
[Notes]	• When either <i>t1</i> or <i>t2</i> is out of the specified range, the settings that were in effect before sending this command remain unchanged.		
	<ul> <li>DLE ENQ 3 cancels the cut sheet waiting state. The data in the receive and print buffers is cleared.</li> </ul>		
[Default]	t1 = 0, t2 = 10		
[Reference]	ESC c 0		

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### ESC p m *t1 t2*

[Name]	Generate pulse				
[Format]	<1B>H<70>H< <i>m</i> >< <i>t</i> 1>< <i>t</i> 2>				
[Range]	m = 0, 1, 48, 49 $0 \le t1 \le 255$ $0 \le t2 \le 255$				
[Description]	$0 \le 12 \le 200$	$p_{\rm nulse}$ specified by t1 and t2 to connector pin m			
[Description]	Outputs the	pulse specified by (7 and 12 to connector pin m.			
	<ul> <li>The value</li> </ul>	es of <i>m</i> specify connector pins as follows:			
	m	Connector pin			
	0, 48	Drawer kick-out connector pin 2			
	1, 49	Drawer kick-out connector pin 5			
	• The pulse	e ON time is $t1 \times 2$ ms and the OFF time is $t2 \times 2$ ms.			
[Notes]	<ul> <li>Keep the</li> </ul>	drawer driving duty within the following ratio:			
	ON time < 0.2				
	(ON time + OFF time) <sup>30.2</sup>				
	It is recommended that t2 be four times t1 or more.				
	<ul> <li>Use a drawer kick-out solenoid with a resistance of 24 Ω or more to avoid exces current flow.</li> </ul>				
	<ul> <li>Make sure to use the printer power supply (drawer kick-out connector pin 4) to the drawer.</li> </ul>				
	• If $t1 > t2$ , the printer processes as $t2 = t1$ .				
	<ul> <li>If <i>m</i> is ou processe</li> </ul>	t of the specified range, this command is ignored. The following data is d as normal data.			
[Reference]	Section 2.2 Connector	.3 Drawer kick-out connector; Appendix C, Notes on the Drawer Kick-out			

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## ESC q

[Name]	Paper release
[Format]	<1B>H<71>H
[Description]	Releases the paper.
[Notes]	<ul> <li>If cut sheet was selected for printing, the printer enters the paper removal waiting state after releasing the paper and after 2 seconds enters paper roll mode.</li> </ul>
	<ul> <li>If the paper roll was selected, the peyt operation starts just after releasing the paper</li> </ul>

If the paper roll was selected, the next operation starts just after releasing the paper.

## ESC t n

[Name]	Select character code table		
[Format]	<1B>H<74>H< <i>n</i> >		
[Range]	0 ≤ <i>n</i> ≤ 5, 2	54 ≤ <i>n</i> ≤ 255	
[Description]	Selects cha	aracter code table <i>n</i> from the following table:	
	п	Character type	
	0	PC437 (U.S.A., Standard Europe)	
	1	Katakana	
	2	PC850 (Multilingual)	
	3	PC860 (Portuguese)	
	4	PC863 (Canadian-French)	

5	PC865 (Nordic)
254	Space page
255	Space page

[Note] If *n* is out of the specified range, this command is ignored.

[Default] *n* = 0

Section 3.2, Character Code Tables; Appendix G, Configuring the Space Page [Reference]

EPSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
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# ESC u n

[Name] [Format] [Range]	Transmit peripheral device status <1B>H<75>H< <i>n</i> > <i>n</i> = 0, 48					
[Description]	Trans The v	smits ti value o	he status of connector pin <i>n</i> if <i>n</i> is used as follows:			
	n		Connector pin			
	0, 4	48	Drawer kick-out connector pin 3			
[Notes]	• Wh • For	then the the R	e connector is not used, the value of bi S-232 serial interface model: DTR/DSR control is selected, the print	t 0 is always 1. er transmits on	lv 1 hyte after c	onfirming
	ti is r	hat the s not re eady.	e host is ready to receive data (DSR si eady to receive data (DSR signal is M	gnal is SPACE ARK), the printe	). If the host co er waits until the	omputer e host is
	۷ د	Nhen ) heckir	KON/XOFF control is selected, the pring the DSR signal.	nter transmits c	only 1 byte withc	out
	• Sin bet sta	Since status is transmitted when this command is buffered, there may be a time lag between command reception and status transmission, depending on the receive buffer				
	• Wh and	When Auto Status Back (ASB) is enabled using <b>GS a</b> , the status transmitted by <b>ESC u</b> and the ASB status must be differentiated, by using the table in Appendix F.			oy ESC u	
	• If <i>n</i>	If <i>n</i> is out of the specified range, this command is ignored.				
	• The	e statu	s data transmitted is shown in the follo	owing table:		
	Bit		Function	Va	lue	
	Dit		T uncaon	0	1	
	0	Pin 3	level	Low	High	
	1	Unde	fined			
	2	Unde	fined			
	3	Unde	fined			
	4	Not u	ised	Fixed	d to 0	
	5	Unde	fined			
	6	Unde	fined			
	7	Not u	ised	Fixed	d to 0	

[Reference] DLE EOT, GS a, GS r

Section 2.2.3, Drawer Kick-out Connector, Appendix F, Transmission status Identification

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### ESC v

[Name]	Transmit paper sensor status	
[Format]	<1B>H<76>H	

[Description] Transmits the status of a paper sensor at command execution.

[Notes] •

The status transmitted is shown below:

Dit	Function	Value		
ы		0	1	
0	Roll paper near-end	Paper	Near-end	
1		adequate	detected	
2	Undefined			
3	Undefined			
4	Not used	Fixed to 0		
5	Cut sheet	Paper	No paper	
6		present		
7	Not used	Fixed	d to 0	

• For the RS-232 serial interface model:

When DTR/DSR control is selected, the printer transmits only 1 byte after confirming that the host is ready to receive data (DSR signal is SPACE). If the host is not ready to receive data (DSR signal is MARK), the printer waits until the host is ready. When XON/XOFF control is selected, the printer transmits only 1 byte without confirming the DSR signal.

• When this command is executed during printing, the status is transmitted after the current line is printed and fed.

(Transmission timing differs from that of **ESC u**, **GS I**, and **GS r**.)

- Since a status is transmitted when this command is buffered, there may be a time lag between command reception and status transmission, depending on the receive buffer state.
- When Auto Status Back (ASB) is enabled using **GS a**, the status transmitted by **ESC v** and the ASB status must be differentiated, by using the table in Appendix F.
- The cut sheet status may not be accurate for paper with holes, such as sprocket-feed paper.

#### [Reference] DLE EOT, GS a, GS r

Section 1.6, Paper Specifications; Appendix F, Transmission Status Identification

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# ESC { n

[Name]	Turn upside-down printing mode on/off	
[Format]	<1B>HH	
[Range]	$0 \le n \le 255$	
[Description]	Turns upside-down printing mode on/off.	
	<ul> <li>Only the lowest bit of n is effective.</li> </ul>	
	When <i>n</i> = <******0>B, upside-down printir When <i>n</i> = <******1>B, upside-down printir	ig is turned off. ig is turned on.
[Notes]	<ul> <li>In upside-down printing mode, the printer rot prints it.</li> </ul>	ates the line to be printed by 180° and then
	<ul> <li>This command is enabled only when it is spe</li> </ul>	cified at the beginning of a line.
	This command is settable but does not have	any effect in page mode.
[Default]	<i>n</i> = 0	
[Example]		
	Upside-down printing mode Ups is turned off: mode	side-down printing de is turned on:
	ABCDEFG	АВСDЕFG
	0 1 2 3 4 5 6	0153429

Paper feed direction

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# GS \* *x y* [*d*]x×y×8

[Name]	Define downloaded bit image
[Format]	<1D>H<2A>H< <i>x</i> >< <i>y</i> >[< <i>d</i> >]x×y×8
[Range]	$1 \le x \le 255$ $1 \le y \le 255$ $x \times y \le 512$
[Description]	Defines a down-loaded bit-image using the number of dots specified by $x$ and $y$
	• The number of dots is $x \times 8$ , in the horizontal direction and $y \times 8$ in the vertical direction.
	<ul> <li>d represents the bit image data.</li> </ul>
	<ul> <li>The down-loaded bit image remains effective until: another definition is made, ESC @ is executed, ESC &amp; is executed, the printer is reset, or the power is turned off.</li> </ul>
[Notes]	<ul> <li>The relationship between the bit-image data and the defined dots is shown in Figure 6.2.1.</li> </ul>
	<ul> <li>A user-defined character set and a downloaded bit image cannot be defined simultaneously. When this command is executed, the user-defined character set is cleared.</li> </ul>
	• If x, y, or $x \times y$ is out of the specified range, this command is ignored.
[Reference]	GS /



Figure 6.2.1 Bit-image Data and Defined Dots

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EFSUN	Specification (STANDARD)	С	NEXT 90	SHEET 89

### GS / m

[Name]Print downloaded bit image[Format]<1D>H<2F>H <m></m>						
[Range]	$0 \le m \le 2$	l, 48 ≤ <i>m</i> ≤ 49				
[Description]	Prints a d	down-loaded bit i	image using the mo	ode <i>m</i> .		
	• The m	odes selectable l	by <i>m</i> are as follows	:		
			Horizontal Direction	on	Maximum Numbar	
	т	Print Mode	Dot Density	Adjoining Dots Specification	of Normal Dots	
	0, 48	Standard	Double-density	Prohibited	400	
	1, 49	Double-width	Single-density	Permitted	200 (*)	
	(*) The total number of dots in the horizontal direction in page mode depends on the printable area set by <b>ESC W</b> and on the printing direction set by <b>ESC T</b> .					
[Notes]	<ul> <li>This command is available only when there is no data in the print buffer.</li> </ul>					
	• If a down-loaded bit image has not been defined, the printer ignores this command.					
	<ul> <li>If a down-loaded bit image exceeds one line, the excess data is not printed.</li> </ul>					
	• User-defined characters and a down-loaded bit image cannot be defined at the same time.					
	<ul> <li>In page mode, double-density mode is disabled.</li> </ul>					
	<ul> <li>Sets the print starting position to the beginning of the line.</li> </ul>					
	<ul> <li>If m is out of the specified range, this command is ignored.</li> </ul>					

[Reference] GS \*

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	Specification (STANDARD)	с	NEXT 91	SHEET 90

### GS E *n*

[Name]	Select head energizing time
[Format]	<1D>H<45>H< <i>n</i> >
[Range]	$0 \le n \le 255$
[Description]	Selects the head energizing time.
	The bit of <i>n</i> are defined as follows:

Bit	Function	Function Status	
Dit	Function	0 1	1
0	Head energizing time	Сору	Normal
1	Undefined		
2	Undefined		
3	Undefined		
4	Undefined		
5	Undefined		
6	Undefined		
7	Undefined		

#### [Notes] • This command is effective only at the beginning of a line.

- The setting is effective for the paper type selected by ESC c 0.
- When both the paper roll and cut sheet are selected for printing by **ESC c 0**, the head energizing time for cut sheet (copy mode) is enabled.
- [Default] Paper roll *n* = 1
  - Cut sheet *n* = 0

[Reference] ESC c 0

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	Specification (STANDARD)	С	NEXT 92	SHEET 91

### GS I n

[Name]	Transmit printer ID							
[Format]	<1D>H<49	<1D>H<49>H< <i>n</i> >						
[Range]	1 ≤ <i>n</i> ≤ 3, 4	9 ≤ <i>n</i> ≤ 51						
[Description]	Transmits the printer ID.							
	n specified	the printer ID as foll	ows:					
	n	Printer ID	Specification	ID (hexadecimal)				
	1, 49	ModelID	TM-U375/TM-U375P	0AH				
	2, 50	Type ID	See the table below					
	3.51	ROM version	Depends on ROM version	**				

[Notes]

For the RS-232 serial interface model:

When DTR/DSR control is selected, the printer transmits only 1 byte after confirming that the host is ready to receive data (DSR signal is SPACE). If the host computer is not ready to receive data (DSR signal is MARK), the printer waits until the host is ready.

When XON/XOFF control is selected, the printer transmits only 1 byte without confirming the DSR signal.

- Since a status is transmitted when this command is buffered, there may be a time lag between command reception and status transmission, depending on the receive buffer state.
- When Auto Status Back (ASB) is enabled using **GS a**, the status transmitted by **GS I** and the ASB status must be differentiated, by using the table in Appendix F.
- The ROM version may change as different versions are released.
- If *n* is out of the specified range, this command is ignored.

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### (**GS I** *n* continued)

D:4	Evention	Type ID :	Status	
DIL	Function	0	1	
0	Two-byte code correspondence	No correspondence	Correspondence	
		Fixed to 0		
1	Auto-cutter	Not installed	Installed	
		Fixed to 0		
2	DIP SW 2-1 setting (DM connection)	OFF	ON	
3	Undefined			
4	Not used	Fixed to 0		
5	Undefined			
6	Undefined			
7	Not used	Fixed	to 0	

[Reference] Section 3.3.3, DIP switches: Appendix F, Transmission Status Identification

EPSON	TITLE TM-U375/U375P	SHEET REVISION	SHEET NO. REVISION	
	Specification (STANDARD)	С	NEXT 94	SHEET 93

### GS L nL nH

[Name]	Set left margin				
[Format]	<1D>H<4C>H< <i>nL</i> >< <i>nH</i> >				
[Range]	0 ≤ <i>nL</i> ≤ 255				
	0 <i>≤ пн ≤</i> 255				
[Description]	Sets the left margin specified by <i>nL</i> and <i>nH</i> .				
	<ul> <li>The left margin is [(nL + 256 × nH) × (horizontal direction fundamental calculation pitch)].</li> </ul>				
	Entire printable area				
	✓ A state of the state of t				
[Notes]	<ul> <li>This command is effective only at the beginning of a line.</li> </ul>				
	<ul> <li>This command sets the left margin for the paper selected by ESC c 1.</li> </ul>				
	<ul> <li>If the calculated result for the left margin is accompanied by a fraction, it is corrected by the minimum mechanical pitch, and the remainder is truncated.</li> </ul>				
	<ul> <li>If the setting exceeds the printable area by one line, the maximum value of the printable area is used.</li> </ul>				
	<ul> <li>If the set printable area width is less than one character when the character data is developed, the following processing is performed:</li> </ul>				
	${f I}$ The printable area width is extended to the right to accommodate one character.				
	If the printable area width cannot be extended sufficiently, the left margin is reduced to accommodate one character.				
	<ul> <li>If the set printable area width is less than one character of minimum width when other than character data (bit image, down-loaded bit image, etc.) is developed, the following processing is performed only on the line in question:</li> </ul>				
	① The printable area width is extended to the right to accommodate one character of minimum width.				
	If the printable area width cannot be extended sufficiently, the left margin is reduced to accommodate one character of minimum width.				
	<ul> <li>In page mode, only the command setting is enabled.</li> </ul>				
[Default]	nL = nH = 0				
[Reference]	GS W, GS P				

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EPSON	Specification (STANDARD)	С	NEXT 95	SHEET 94

# GS P x y

[Name]	Set horizontal and vertical motion units
[Format]	<1D>H<50>H< <i>x</i> >< <i>y</i> >
[Range]	$0 \le x \le 255$ $0 \le y \le 255$
[Description]	<ul> <li>Sets the fundamental calculation pitch to 1/x inch in the horizontal direction and 1/y inch in the vertical direction.</li> </ul>
	When $x = 0$ and $y = 0$ , the pitches are restored to the default values.
[Notes]	<ul> <li>Values already set using other commands do not change even if this command is executed.</li> </ul>
	• The calculated result from combining this command with others (such as for setting the paper feed amount) is truncated to the minimum pitch value of the mechanical pitch (1/160 inch horizontal, 1/144 inch vertical).
[Default]	<i>x</i> = 160, <i>y</i> = 144
[Reference]	ESC SP, ESC \$, ESC 3, ESC J, ESC W, ESC  GS L, GS W
[Example]	When n in <b>ESC 3</b> is initially set to 48, a paper feed amount of $48/144$ inch (1/3 inch) is obtained. When x and y in <b>GS P</b> are set to 0 and 240 respectively and n in <b>ESC 3</b> is set to 48, 48/240 (1/5 inch) paper feed amount is obtained.

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EFSUN	Specification (STANDARD)	С	NEXT 96	SHEET 95

### GS W nL nH

[Name]	Set printing area width
[Format]	<1D>H<57>H <nl><nн></nн></nl>

[Range]  $0 \le nL \le 255$ 

0 ≤ *nH* ≤ 255

[Description] Sets the printable area width specified by *nL* and *nH*.

• The printable area width (in inches) equals  $[(nL + 256 \times nH) \times (fundamental calculation pitch)]$ .



[Notes] • This command is effective only at the beginning of a line.

- This command sets the printable area width for the paper selected by ESC c 1.
- If the setting exceeds the printable area by one line, the maximum value of the printable area, except for the left margin, is used.



- If the calculated result for the printable area width is accompanied by a fraction, it is corrected by the minimum mechanical pitch, and the remainder is truncated.
- If the set printable area width is less than one character when the character data is developed, the following processing is performed:
  - ① The printable area width is extended to the right to accommodate one character.



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② If the printable area width cannot be extended sufficiently, the left margin is reduced to accommodate one character.



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EFSUN	Specification (STANDARD)	С	NEXT 98	SHEET 97

### GS a *n*

[Name]	Enable/disable Automatic Status Back (ASB)
[Format]	<1D>H<61>H< <i>n</i> >
[Range]	$0 \le n \le 255$

[Description] Enables or disables ASB and specifies the status items to include.

• The bit of *n* are defined as follows:

Dit	Function	Function Status		
БІІ		0	1	
0	Drawer kick-out connector pin 3	Disabled	Enabled	
1	On-line/Off-line	Disabled	Enabled	
2	Error	Disabled	Enabled	
3	Paper roll sensor	Disabled	Enabled	
4	Undefined			
5	Cut sheet sensor, cut sheet status	Disabled	Enabled	
6	Undefined			
7	Undefined			

[Notes] • The ASB function is disabled if no status is selected.

- If any of the above status items are selected, ASB is enabled and the printer automatically transmits 4 status bytes whenever the selected status changes.
- If ASB is enabled while processing this command, the current status is transmitted with no regulations.
- The 4 status bytes are transmitted without checking DSR.
- The 4 status bytes must be consecutive, except for XOFF code.
- Four status bytes are transmitted while this command is buffered, so there may be a time lag between command reception and status transmission.
- When the printer is canceled by **ESC =**, this command is disabled but ASB is always in effect.
- When using **DLE EOT**, **ESC u**, **ESC v**, **GS I**, or **GS r**, the status transmitted by these commands, the **GS a** status, and the ASB status must be differentiated, by using the table in Appendix F.
- Status information may not be accurate when paper with holes, such as sprocket-feed paper, is used.

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• The transmitted status is shown in the tables below.

First byte (printer information):

Bit	Function	Printer Status		
	Function	0	1	
0	Not used	Fixed to 0		
1	Not used	Fixed to 0		
2	State of drawer kick-out connector pin 3	Low	High	
3	On-line/Off-line	On-line	Off-line	
4	Not used	Fixed to 1		
5	Cover state	Closed	Open	
6	Paper feeding by PAPER FEED button	Not feeding	Feeding	
7	Not used	Fixed to 0		

Second byte (error information):

Bit	Function	Function Status		
		0	1	
0	Undefined			
1	Undefined			
2	Mechanical error	No error	Error	
3	Undefined			
4	Not used	Fixed to 0		
5	Unrecoverable error	No error	Error	
6	Head temperature	No error	Error	
7	Not used	Fixed to 0		

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EFSUN		Specification (STANDARD)	С	NEXT 100	SHEET 99

Third byte (paper sensor information):

Bit	Function	Function Status		
	Function	0	1	
0	Paper roll poor and	Paper	Near-end	
1	Paper foil hear-end	adequate	detected	
2	Undefined			
3	Undefined			
4	Not used	Fixed to 0		
5	Cut sheet	Deper procent		
6	Cut sheet	Paper present	No paper	
7	Not used	Fixed to 0		

Fourth byte (cut sheet sensor information):

Dit	Function	Function Status		
ы	Function	0	1	
0	Slip paper	Selected	Not selected	
1	Slip paper status	Printable	Not printable	
2	Validation paper	Selected	Not selected	
3	Validation paper status	Printable Not prin		
4	Not used	Fixed to 0		
5	Cut aboat	Banar procent	No popor	
6		rapei pieseili	No paper	
7	Not used	Fixed to 0		

- Bit 1: The slip paper state becomes 0 (printable) after paper loading and becomes 1 (not printable) at ejection start or time-out.
  - When the slip paper is selected and the printer goes into the slip waiting state, bits 5 and 6 of the third byte become 1 (no paper), bits 0 and 1 of the fourth byte becomes 0 (slip is selected) and 1 (not printable), respectively.
  - When printing stop for slip paper is disabled using **ESC c 4**, the slip status does not become 1 (not printable) even when there is no printable area. Use **GS r 3** to confirm the printable area remaining on the slip paper.
  - When the RELEASE button is pressed during printing on slip paper, this value becomes 1 (not printable).

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	Specification (STANDARD)	С	NEXT 101	SHEET 100

- Bit 3: The validation paper status becomes 0 (printable) after paper loading and becomes 1 (not printable) at ejection start or time-out.
  - When validation paper is selected and the printer goes into the validation waiting state, bits 5 and 6 of the third byte become 1 (no paper), bits 2 and 3 of the fourth byte become 0 (validation is selected) and 1 (not printable), respectively.
  - When printing stop for validation paper is disabled using **ESC c 4**, the validation status does not become 1 (not printable) even when there is no printable area. Use **GS r 3** to confirm the printable area remaining on the validation paper.
  - When the RELEASE button is pressed during printing on validation paper, this value becomes 1 (not printable).
- [Default] DIP switch 2-3 OFF, n = 0

DIP switch 2-3 ON, n = 2

#### [Reference] DLE EOT, ESC u, ESC v, GS r

Section 1.6, *Paper Specifications*; Appendixes F, *Transmission Status Identification*; Appendix I, *Example Print Control for Cut Sheets* 

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	Specification (STANDARD)	С	NEXT 102	SHEET 101

### GS r *n*

[Name]	Transmit	status			
[Format]	<1D>H<7	'2>H <n></n>			
[Range]	$1 \le n \le 2$ ,	$49 \le n \le 50$			
[Description]	Transmit	s the status specified by <i>n</i> .			
	n	Function			
	1, 49:	Transmits paper sensor status (same as <b>ESC v</b> )			
	2, 50:	Transmits drawer kick-out connector status (same as <b>ESC u 0</b> )			
	3, 51	Transmits cut sheet status			
[Notes]	• For the	RS-232 serial interface model:			
	Whet that t is not beco Whet confi	n DTR/DSR control is selected, the printer transmits only 1 byte after confirming he host is ready to receive data (DSR signal is SPACE). If the host computer t ready to receive data (DSR signal is MARK), the printer waits until the host mes ready. n XON/XOFF control is selected, the printer transmits only 1 byte without rming the DSR signal.			
	<ul> <li>Since a status is transmitted when this command is buffered, there may be a time lag between command reception and status transmission, depending on the receive buffer state.</li> </ul>				
	• When A GS r n	Automatic Status Back (ASB) is enabled using <b>GS a</b> , the status transmitted by and the ASB status must be differentiated, by using the table in Appendix F.			
	<ul> <li>Paper s</li> <li>such as</li> </ul>	ensor status and cut sheet status may not be accurate for paper with holes, s sprocket-feed paper.			
	• If <i>n</i> is o	ut of the specified range, this command is ignored.			
	<ul> <li>The state</li> </ul>	tus transmitted is explained in the following descriptions and tables.			
	n = 1 P	aner sensor status			

Dit	Function	Function Status		
DIL	Function	0	1	
0	Paper roll pear and	Paper	Near-end	
1	raper foil flear-end	adequate	detected	
2	Undefined			
3	Undefined			
4	Not used	Fixed to 0		
5	Cutobast	Deper present	No nonor	
6		raper present	No paper	
7	Not used	Fixed to 0		

<i>n</i> = 1:	Paper sensor status	
---------------	---------------------	--

EPSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	С	NEXT 103	SHEET 102

*n* = 2: Drawer kick-out connector status

Bit	Function	Function Status		
ы	Function	0	1	
0	Pin 3 level	Low	High	
1	Undefined			
2	Undefined			
3	Undefined			
4	Not used	Fixed to 0		
5	Undefined			
6	Undefined			
7	Not used	Fixed to 0		

n = 3: Cut sheet status

• Transmits the values 00H - 0FH, indicating the remaining printable area as follows:

Number of Remaining Dots	Cut sheet Status
0 to 8	00H
9 to 17	01H
18 to 26	02H
117 to 125	0DH
126 to 134	0EH
135 -	OFH

• Transmits the values 00H - 0FH, indicating the remaining printable area as follows:

[Reference]

DLE EOT, ESC u, ESC v, GS a

Section 1.6, Paper Specifications; Appendix F, Transmission Status Identification

EPSON	TITLE TM-U375/U375P	SHEET REVISION	NO.	
	(STANDARD)	С	NEXT 104	SHEET 103

### 6.3 Ignored Command

The printer ignores the following command:

**ESC c 3** *n* (This command is available only with a parallel interface model and is ignored with a RS-232 serial interface model.)

ESC c 6 *n* 

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EFSUN		Specification (STANDARD)	С	NEXT App.1	SHEET 104

## APPENDIX A: MISCELLANEOUS NOTES

1) Print duty

- When printing exceeds the allowable print duty cycle, the printer automatically detects the print head temperature rise, stops logic-seeking, and enters full-column print head movement operation. This stops the temperature rise by lowering print duty. If the print head temperature continues to rise, the printer stops the print head. In this case, the user should be aware that the printing speed may slow significantly.
- Printing that uses a particular print head pin should be avoided as much as possible. In particular, excessive use of pin 9 may cause a significant drop in printing speed, as this pin is used for measuring temperature.
- When printing is stopped due to high print head temperature, the ERROR LED blinks as shown in Table 3.8.1, Automatically Recoverable Errors, and the printer goes off-line. The printer automatically goes back on-line when the print head temperature falls.
- The upper limiting conditions on continuous printing are as follows. (An example test pattern is shown in Figure A-1.)

[Conditions] • Maximum continuous printing time: 1 hour

• Number of line feeds:

- Ambient temperature: 25°C (77°F)
  - Set the number of lines to be fed based on the following ratio:

B: ratio between printed lines and fed lines

$$B \le \frac{15 \text{ printed lines}}{10 \text{ lines fed}}$$

Print head duty:

The number of print columns must be 20 or less in fullcolumn print head movement operation.

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	Specification (STANDARD)	С	NEXT App.2	SHEET App.1



Figure A-1 Continuous Printing Test Pattern

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	Specification (STANDARD)	С	NEXT App.3	SHEET App.2

#### 2) Notes on printing and feeding

- a)Cut sheet printing
  - Cut sheet should be used with the paper roll loaded.
  - Print head wire pressure may leave print traces on the paper roll.
  - The paper roll is fed slightly at every cut sheet operation (printing, paper holding, etc.) even when the paper roll is not selected.
- b) The paper roll may be fed slightly when printing starts, with the platen closed.
- c) When the manual cutter is used, make sure to feed one line (1/6 inch) or more before printing, to avoid shifting print starting position.
- 3) Note on the ribbon cassette

Be aware that use of a ribbon cassette other than that specified by Epson could damage the printer and voids the warranty.

4) Notes on printer storage

To avoid staining the paper and twisting the ribbon, be sure to release the print platen (by pressing the RELEASE button with the printer power on) at the following times:

- When the printer will not be used for more than 24 hours.
- When installing or removing the ribbon cassette during printing.

5) Others

Because the printer uses plated steel, the cutting edges may be subject to rust.

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EFSUN	Specification (STANDARD)	С	NEXT App.4	SHEET App.3

## APPENDIX B: ADJUSTING THE PAPER ROLL NEAR-END SENSOR LOCATION

The remaining detectable amount of paper on the paper roll depends on the inside and outside diameters of the paper spool. The minimum detectable amount of paper on the paper roll can be set using the following procedure:

- 1) The inside diameter ( d) of the paper spool should be 10 mm (.39") or more.
- 2) Set the paper roll diameter A to obtain the corresponding adjustment position from the following table:



Dimension A	Adjustment position
Approx. 10 mm (.39")	#1
Approx. 8 mm (.32")	#2
Approx. 6 mm (.24")	#3
Approx. 4 mm (.16")	#4
Approx. 3 mm (.079")	#5



- NOTES: 1. Since diameter A corresponding to the adjustment position in the table is calculated from standard measurements, there may be some variations depending on the printer.
  - 2. If a paper roll with a red end mark at the paper end is used, the mark may cause the paper to stick together. If this occurs, diameter A differs from the values in the table.
  - 3. Be sure that the adjustable slider operates smoothly after finishing the adjustment.
  - 4. If the paper on the paper roll becomes loose due to the paper quality, the paper roll nearend sensor may operate incorrectly.

EDGON	TITLE TM - U375/U375P	SHEET REVISION	NO.	
EFSUN	Specification (STANDARD)	С	NEXT App.5	SHEET App.4

# APPENDIX C: NOTES ON USING THE DRAWER KICK-OUT CONNECTOR

1) Drawer specifications (see Section 3.2.3, Drawer kick-out connector)

Drawer specifications differ significantly depending on manufacturer and model number. Make sure that the specifications of the drawer used meet the following conditions when connected to the drawer kick-out connector. These conditions also apply to any equipment (other than a drawer) that is connected to the drawer kick-out connector.

Never use a drawer (or other equipment) that does not meet all of the following conditions:

- The load, such as a drawer kick-out solenoid, must be connected between pins 4 and 2 or pins 4 and 5 of the drawer kick-out connector. (\*1)
- When the drawer open/close signal (indicating the state of the drawer) is used, a switch must be provided between drawer kick-out connector pins 3 and 6. (\*2)
- The resistance of the load, such as a drawer kick-out solenoid, must be  $24 \,\Omega$  or more or the input current must be 1A or less. (\*3)
- Make sure to use the 24 V power output on drawer kick-out connector pin 4 for driving the equipment. Never connect any other power supply to the drawer kick-out connector. (\*4) The peak current is 1 A. See item 2) below for drive signal duty.

NOTES: (\*1): Proper operation is not guaranteed with different connections.

- (\*2): Proper operation is not guaranteed with different connections or connection to a component other than a switch.
- (\*3): Connection to equipment whose resistance is  $24 \Omega$  or less or whose input current is 1 A or more may damage the connected equipment as well as the printer.
- (\*4): Operation is not guaranteed with other power supplies.

2) Notes on the pulse generating command (ESC p)

When using ESC p to drive the drawer connected to the drawer kick-out connector, set the command parameters to meet the following conditions:

ESC	р	т	<u>t1</u>	<u>t2</u> ∱	
					OFF time
					ON time

ON time ON time + OFF time ≤ 0.2 ..... Formula C-1

or, OFF time  $\geq$  ON time  $\times$  4 ...... Formula C-2

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EFSUN	Specification (STANDARD)	С	NEXT App.6	SHEET App.5

The drive signal waveform generated when the drawer is driven according to the above conditions is shown in Figure C-1.



#### Figure C-1 Drawer Drive Signal Waveform (Formulas C-1 and C-2)

The ON time depends on the specifications of the drawer used. Be sure to check the drawer specifications and set a suitable time. To use a drawer that does not meet the conditions of Formulas C-1 and C-2, see the following section.

3) Using a drawer that does not meet the conditions in 2)

Setting the values of t1 and t2 according to the conditions in 2) results in a maximum ON time of 126 ms ( $0 \le t1 \le 63$ ), since the setting ranges of t1 and t2 are 0 to 255. To use a drawer that requires an ON time exceeding 126 ms, the following conditions must be met:

$$\frac{\text{ON time}}{\text{ON time + (OFF time + }\alpha)} \leq 0.2 \dots$$

 $\alpha$ :other sequence processing time

NOTE:  $\alpha$  is the drawer-driving prohibited period from the OFF time until the next ON time.

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EFSUN	Specification (STANDARD)	С	NEXT App.7	SHEET App.6

An example program in which the drawer connected to drive signal 1 is driven with an ON time of 200 ms is shown below.



(\*) Corresponds to  $\alpha$  of Formula C-3. Set the value so that it satisfies Formula C-3 (or include an internal processing time that is equal to or longer than this wait routine).

The drive signal waveform generated when the drawer is driven according to the above conditions is shown in Figure C-2.



Figure C-1 Drawer Drive Signal Waveform (Formula C-3)

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	Specification (STANDARD)	С	NEXT App.8	SHEET App.7

# APPENDIX D: LOADING THE RIBBON CASSETTE

When printing starts to fade, the life of the ribbon has expired. Replace the ribbon cassette with a new one.

Use the Epson ribbon cassette ERC-38 (P) or ERC-38 (B) listed in this specification.

The warranty is voided if a non-Epson ribbon cassette is used.

The replacement procedure for the ribbon cassette depends on whether the printer power is on or off, as follows:

1) Replacing the ribbon cassette when the printer power is off:

- ① Turn on the printer power.
- ② Open the main unit cover.
- ③ Remove the old ribbon cassette from the printer.
- ④ Load the new ribbon cassette.
- ⑤ Confirm that the ribbon is properly placed between the mask plate and the print head.
- 6 Close the main unit cover.
- 2) Replacing the ribbon cassette when the printer power is on:
  - ① Open the main unit cover.
  - <sup>②</sup> Release the paper roll by using the RELEASE button. If a cut sheet is inserted, however, do not release the paper roll, as this will also release the paper clamp.
  - $\ensuremath{\textcircled{}}$  Remove the old ribbon cassette from the printer.
  - ④ Load the new ribbon cassette.
  - ⑤ Confirm that the ribbon is properly placed between the mask plate and the print head.
  - <sup>®</sup> Close the main unit cover.

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# APPENDIX E: OPENING AND CLOSING THE CLAMSHELL MECHANISM

The printer is provided with a clamshell mechanism to facilitate clearing paper jams and removing objects dropped into the printer.

Follow the procedures below when opening or closing the clamshell mechanism:

- ① Turn on the printer power.
- ② Open the main unit cover.
- 3 Unload the ribbon cassette from the printer.
- ④ Lift the clamshell mechanism while pulling the lever on its right side in the direction indicated by the arrow. This opens the printer mechanism. Pull the jammed paper out in the paper feed direction to remove it. Never pull the paper in the opposite direction.
- © Confirm that the print head is at the center of the printer. If not, wait until the print head cools sufficiently and then move it to the center.
- <sup>®</sup> Push down the head cover. The mechanism closes with a click.
- $\ensuremath{\overline{\mathcal{O}}}$  Load the ribbon cassette.
- <sup>®</sup> Close the main unit cover.

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EFSUN	Specification (STANDARD)	С	NEXT App.10	SHEET App.9

# APPENDIX F: TRANSMISSION STATUS IDENTIFICATION

The values of specific bits are fixed in the status information transmitted by the printer, so that the status bytes of commands can be identified. The user can therefore confirm the command to which the status belongs, as shown in the following table.

When using Auto Status Back (ASB), however, process the consecutive three-byte code (except for XOFF) as ASB data after confirming the first byte of the ASB. Otherwise, the status transmitted by using the command and the status of the second and following bytes of the ASB cannot be differentiated.

Command & Function	Status Reply
ESC u	<0**0***>B
ESC v	<0**0***>B
GS I	<0**0***>B
GS r	<0**0***>B
XON	<00010001>B
XOFF	<00010011>B
DLE EOT	<0**1**10>B
ASB (1st byte)	<0**1**00>B
ASB (2nd byte - 4th byte)	<0**0****>B

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EFSUN	Specification (STANDARD)	С	NEXT App.11	SHEET App.10

# APPENDIX G: CONFIGURING THE SPACE PAGE

The space page is the page where character codes 80H to FFH are all spaces. This page is selected when n is set to 254 or 255 using the character code table selection command **ESC t**.

1) Space page top address

Page	Conthuna	Character Top Address		
	Fonttype	5 × 9	7 × 9	
254	Space page	6000H	6C00H	
255	Space page	6600H	7600H	

2) Calculating the character data top address

Calculate the font data top address as follows:

- + 5  $\times$  9 font (graphics)
  - <u>Address = Character data top address + (character code 80H) × 12</u>
- 7 × 9 font (graphics)

Address = Character data top address + (character code 80H) × 20

- 3) Example font data configuring
  - + 5  $\times$  9 font (character code 90H on page 254)



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Horizontally adjacent continuous character patterns must not be defined for the  $7 \times 9$  font



The pattern shown above, in which  $\bullet$  and  $\odot$  adjoin horizontally, is prohibited.

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# APPENDIX E: EXAMPLE PRINTING IN PAGE MODE

Example use of page mode is described in this appendix.

A typical procedure for transmitting commands in page mode is as follows:

- ① Transmit ESC L to enter page mode.
- 2 Specify the printable area using **ESC W**.
- 3 Specify the printing direction using ESC T.
- ④ Transmit the print data.
- <sup>⑤</sup> Collectively print the data by sending an FF.
- <sup>®</sup> After printing, the printer automatically returns to standard mode.

Example 1: Sample program in BASIC (assumes transmission to the printer is already possible with file #1 open)

- 100 PRINT #1,CHR\$(&H1B);"L";
- 110 PRINT #1,CHR\$(&H1B);"W";CHR\$(0);CHR\$(0);CHR\$(0);CHR\$(0);
- 120 PRINT #1,CHR\$(100);CHR\$(0);CHR\$(200);CHR\$(0);
- 130 PRINT #1,CHR\$(&H1B);"T";CHR\$(0);
- 140 PRINT #1,"Page mode lesson TEST 1"
- 150 PRINT #1,CHR\$(&HC);

In the program for Example 1, a printable area of  $200 \times 200$  dots starting at (0. 0) is set, and characters are printed on the first line of the area as shown in Figure H-1 below.



Figure H-1 Page Mode Example 1

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Note that a line feed was inserted between "lesson" and "TEST 1" in Figure H-1. This line feed was inserted automatically because there was no room for the blank " " following the word "lesson" within the horizontal range of the  $200 \times 200$  printable area. The feed amount here is that specified by **ESC 3**. Any number of printable areas can be specified before the **FF** is executed. If any printable areas overlap, however, the logical sum of the data written to the overlapping portions is used for the final printing.

It is possible to erase a portion of the data that is already developed. Using **ESC W**, specify a printable area consisting of only the section to be erased, then use **CAN** to erase the data. Note that all the data existing in the specified printable area is erased, even if it is just a portion of a character.

Example 2: Sample program in BASIC

- 100 PRINT #1,CHR\$(&H1B);"L";
- 110 PRINT #1,CHR\$(&H1B);"W";CHR\$(0);CHR\$(0);CHR\$(0);CHR\$(0);
- 120 PRINT #1,CHR\$(200);CHR\$(0);CHR\$(200);CHR\$(0);
- 130 PRINT #1,CHR\$(&H1B);"T";CHR\$(0);
- 140 PRINT #1,"Page mode lesson 2 CAN command"
- 150 PRINT #1,CHR\$(&HA);
- 160 PRINT #1,"ABCDEFGHIJKLMNOPQRST1234567890"
- 170 PRINT #1,CHR\$(&HC);

This example works as follows:

First, transmit **ESC L** to switch to page mode (line no.100). Then use **ESC W** to send 8 arguments, from n1 to n8 to specify the printable area. To specify a printable area of 200 dots in the x direction and 200 dots in the y direction, starting from the origin (0, 0), the arguments are transmitted in the order of 0, 0, 0, 0, 200, 0, 200, 0 (line nos. 110 and 120). In addition, the printing direction is specified as 0 by using **ESC T** (line no.130).

After these items are specified, the print data "Page mode lesson 2 CAN command " and " ABCDEFGHIJKLMNOPQRST1234567890 " are transmitted (line no. 140 to 160). By sending **FF** (line no.170), the printout shown in Figure H-2 is produced.

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#### Figure H-2 Page Mode Example 2

If the program listed below is included before the **FF** is transmitted, a portion of the data will be deleted:

- 170 PRINT #1,CHR\$(&H1B);"W" ;CHR\$(72);CHR\$(0);CHR\$(48);CHR\$(0);
- 180 PRINT #1,CHR\$(36);CHR\$(0);CHR\$(24);CHR\$(0)
- 190 PRINT #1,CHR\$(&H18);
- 200 PRINT #1,CHR\$(&HC);

If the above program is included, character string "GHI" is deleted, resulting in the printout shown in Figure H-3. When an area is deleted with **CAN**, the deleted part is left blank.

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Figure H-3 Page Mode Example 3

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	Specification (STANDARD)	С	NEXT App.17	SHEET App.16
# APPENDIX I: EXAMPLE PRINT CONTROL FOR CUT SHEETS



- 1) Enables printing stop due to validation paper-end.
- 2) Enables ASB for all status changes.
- 3) Receives ASB due to 2).
- 4) Selects validation printing.
- 5) Waits for validation paper to be selected.

ASB: waits for validation paper selection (ASB 4-0\*) to be "selected"(0).

\* indicates bit 0 of the fourth byte of the ASB data. The same rule applies correspondingly to the following:

6) Waits for validation paper to be inserted.

ASB: wait for validation sensor (ASB 3-5) to be "paper present"(0).

 To cancel the validation paper waiting state, send DLE ENQ 3.

When canceled, the printer returns to paper roll mode, and the 4 bytes of ASB are transmitted.

ASB: validation paper state (ASB 4-1) becomes "not selected" (1).

8) Waits for the validation to be prepared for printing.

ASB: waits for the validation paper state (ASB 4-1) to be "printable" (0).

9) Transmits each line of print data until there is no data to be transmitted.

In this case, ASB is transmitted when the paper has run out.

ASB: validation paper state (ASB 4-1) becomes "not printable" (1).

Advances to step 10) when all the data has been sent.

10) Ejects the validation paper.

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EFSUN	Specification (STANDARD)	С	NEXT App.18	SHEET App.17

# APPENDIX J: NOTES ON NUMBER OF PRINTABLE COLUMNS

When DIP switch 2-2 is set to ON to increase the number of printable columns, the relationship between the number of dots and the printable area is as shown in the table below. The OFF setting is shown for comparison.)

DID owitch 2.2 potting	Number of Horizontal Dots/Character		Drintable Area/Line	
DIP Switch 2-2 Setting	$7 \times 9$ Font	$5 \times 9$ Font	Printable Area/Line	
OFF	10	12 (*)	400	
ON	9	11 (*)	385	

(Units: half dots)

(\*) The 5  $\times$  9 font uses 6 normal dots for one character, but the printer processes the data as 12 half-dots in the print buffer. Therefore, in this case the printer processes the data as 11 half-dots for one character.

There are restrictions when DIP switch 2-2 is ON, as follows:

1) The printable area for one line is decreased.

Setting DIP switch 2-2 to ON increases the number of printable columns per line but decreases the printable area for one line. Be sure to note the end position of a line and the number of dots for bit-images.

2) The 10th dot is not printed in the  $7\times9$  font.

The 7  $\times$  9 font uses 10 half-dots for one character. However, when DIP switch 2-2 is ON, the printer does not print the 10th dot, since the number of printable dots in this setting is 9 and the 10th byte is truncated. Therefore, the 10th dot in some characters is not printed during extended graphic character printing.

This applies to the character for which dots are defined for the 10th byte and to the characters that corresponds to the following character codes.

Character Code Table (	oage) Character Code
0, 2, 3, 4, 5	<b0>H, <b2>H</b2></b0>

3) The printing results may differ even if the same data is printed.

The printer cannot print horizontally adjacent dots. Therefore, the printing results may differ even if the same character codes are transmitted, since the dots placed on the borderline between characters differ depending on the DIP switch 2-2 setting. Particularly in line drawings, a line may be broken when DIP switch 2-2 is ON.

Example: When transmitting two characters of character code <C4>H (page 0) in the  $7 \times 9$  font (data only), the results are as follows:



© cannot be printed due to adjacent half-dot printing restriction.

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EFJUN	Specification (STANDARD)	С	NEXT App.19	SHEET App.18

# APPENDIX K: DIFFERENCES BETWEEN THE TM-U370 AND THE TM-U375

ltem	TM-U370	TM-U375	
<ol> <li>Paper feeding after printing a down-loaded bit image or after printing in page mode.</li> </ol>	Feeds the specified amount of paper after the last pass.	Feeds only the minimum amount of paper required after the last pass.	
2. Ignored commands in page mode (including parameters).			
ESC c 0	Ignored in page mode (command and parameter data are lost).	Invalid in page mode (parameters are processed as printable data).	
<b>ESC</b> ! Setting 7 × 9 font	Same as above	Commands can be set in page	
ESC E ESC G ESC V ESC a ESC { GS L GS W		mode but will only be acted on after the printer returns to standard mode.	
ESC T ESC W	Ignored in standard mode (including parameters).	Commands can be set in standard mode but will only be acted on after the printer returns to page mode.	
ESC ! Setting 7 × 9	Ignored if 90° rotation mode is specified (command and parameter data are lost).	If 90° rotation mode is specified, the characters are printed without rotated.	
ESC V	Ignored if $7 \times 9$ font is selected by <b>ESC</b> ! (command and parameter data are lost).	Available when $7 \times 9$ font is selected by <b>ESC</b> !. Characters are $90^{\circ}$ rotated when $5 \times 7$ font is selected.	

The TM-U370 and the TM-U375 differ in the following points.

Table K.1	Differences	between the	TM-U370	and the	TM-U375
	Dillorollooo				

EDSON	TITLE TM - U375/U375P	SHEET REVISION	NO.	
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Item	TM-U370	TM-U375
3. HT processing after the end of a line.	In standard mode: Executes tab at the beginning of the next line. In page mode: Only moves the print position to the beginning of the next line.	Executes tab at the beginning of the next line in both standard and page modes.
4. Processing of commands that function only when	Ignored except at the beginning of a line (including parameters).	Invalid except at the beginning of a line (parameters are processed as printable data).
received at the beginning of a line.	Applicable commands: ESC {, GS E,	GS L, GS W
	TM-U370: Commands (other than th the beginning of a line do parameters are not charac	ose above) that are functional only at not affect printing, because their cter codes.
5. Character alignment ( <b>ESC a</b> )	The area from the beginning of the line to the right end of the characters is aligned.	The area from the beginning to the position specified in the line are aligned.
	Example: Specifies the print po	ositions in the order of and
	│ │ ↑ ↑ │ │ ② ① Area to be aligned.	│ │ ↑ ↑ │ │ ② ① Area to be aligned.
6. Printing a downloaded bit image	When sending single-density downloaded bit images, if there is only one dot space in the print buffer at the end of the line, the printer only feeds one line.	When sending the single-density downloaded bit images, if there is only one dot space in the print buffer at the end of the line, the printer feeds the amount equal to the number of the vertical dots of the downloaded bit image.
7. <b>GS I</b>	Model ID = 06H	Model ID = 0AH

## Table K.1 Differences between the TM-U370 and the TM-U375 (continued)

## 2) Paper specifications

ltem	TM-U370	TM-U375
Validation paper size	135 to 182 mm × 90 to 257 mm	135 to 182 mm × 70 to 257 mm
(Width $ imes$ Length)	(5.31 to 7.17" × 3.54 to 10.12")	(5.31 to 7.17" × 2.76 to 10.12")

EPSON	TITLE TM - U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	С	NEXT App.21	SHEET App.20

## APPENDIX L: Bidirectional Parallel Interface

## L.1 Description

The printer interface configured to the parallel interface specifications conforms to the IEEE-1284 Level-1 Devices and it works with those communication modes described in G.1.1 below.

#### L.1.1 Parallel Interface Communcation Modes

The parallel interface available with this product offers three communication modes as listed below. When the power is applied to the printer or the printer is reset, the initialization mode is Compatibility Mode.

Compatibility Mode

This mode allows byte-by-byte data transmissions from the host to the printer. The normal data acception is proceeded in this mode. All the other modes are accessible through the Compatibility Mode.

Nibble Mode

This mode allows data transmission from the printer to the host in units of four bits. Data transmissions from the printer are made via the status signal lines. To transmit one byte data in this mode, four bits data is transmitted twice in succession.

• Byte Mode

This mode allows data transmission from the priter to the host in units of byte. Data transmissions from the printer are made via the eight bits data signal lines. To enable the Byte Mode, the host must be capable of switching the direction of signals for the eight bits data signal lines.

The communication direction from the host to the printer is referred to as Forward Mode, while the communication direction from the printer to the host is called Reverse Mode.

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EFSUN	Specification (STANDARD)	С	NEXT App.22	SHEET App.21

## L.1.2 Interface Operation Phases

Interface operation is divided into a number of interface phases. Each communication mode consists of one or more phases. Additional phases are defined to cover initialization and transitions between communication modes. The names and interpretations of the interface signals may vary between phases.



Figure L.1.2.1 Interface phase transitions

EDSON	TITLE TM - U375/U375P	SHEET REVISION	NO.	
EFSUN	Specification (STANDARD)	С	NEXT App.23	SHEET App.22

- 1) Host Requests Reverse Transfer.
- 2) Successful Negotiation to Another mode.
- 3) Peripheral Has Data To Send.
- 4) Peripheral Has No Data To Send. nDataAvail = High
- 5) Host Goes To Idle.
- 6) Peripheral Has New Data.
- 7) Peripheral Has Data Send.
- 8) Host Requests Data Byte.
- 9) Host Receives Data Byte.Peripheral Has No More Data To Send. nDataAvail = High10) Host receives Data Byte.
  - Peripheral Has More Data. nDataAvail = Low
- 11) Host requests termination.
- 12) Interface Returns To The Compatible Mode.
  - \*In states other than in the process of data acception, the interface is set in the Forward Idle phase.

nDataAvail = Low

HostBusy = Low

### L.1.2.1 Phases in Compatibility Mode

• Compatibility Mode Forward Data Transfer phase:

This phase allows the printer to accept data from the host. The host and the printer perform handshaking in response to the signals, nStrobe, nAck and Busy. The host shall not initiate any negotiation phase to a new operating mode until the interface successfully returns to the Compatibility Mode Forward Idle phase.

• Compatibility Mode Forward Idle phase:

The interface is in Compatibility Mode, with no data transfer in progress. The host is allowed to initiate a data transfer in Compatibility Mode, or initiate negotiation phase to a new operating mode.

#### L.1.2.2 Phases in Nibble Mode and Byte Mode

• Reverse Data Transfer phase:

Data transfer from the printer to the host.

• Reverse Host Busy Data Available phase:

The printer has data to transmit to the host.

• Reverse Host Busy Data Not Available phase:

The printer has no more data to transmit.

- Reverse Idle phase: No data transfer is in progress and the host is waiting for the printer data. When any printer data is available, the printer will cause the interface to go to the Reverse Interrupt phase.
- Reverse Interrupt phase:

This phase makes the printer report to the host that it has got data to transfer in the Reverse Idle phase. While in this phase, the host may cause the interface to go to the Termination phase.

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## L.1.2.3 Other phases

Initialization phase:	This phase includes both power-on initialization and host-driven interface reset.
Negotiation phase:	Signal handshaking to change the signaling method from Compatibility Mode to Nibble, Byte or other such modes.
Power-on phase:	This phase includes power-on initialization for both devices.
Termination phase:	A host-initiated transition phase in which the interface is changed from Nibble, Byte or other such Mode to Compatibility Mode.

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## L.2. Interface Operation

#### L.2.1 Power-On

In this interface, the printer status after power-on sequence is available by checking Logic-HIGH.

In 500 ms after Logic-HIGH exceeds High level (3.0 V) following the power-on sequence, all signals become active.

#### L.2.2 Hardware Reset

The printer may be forcedly reset through the nInit signal. However, in either of the following conditions, the forced printer reset becomes inoperative and Low level pulses are ignored. • When the 1284-active(Select-In) singal is High.



Figure L.2.2.1 nlnit signal-driven hardware reset

## L.2.3 Compatibility Mode

#### L.2.3.1 Description

The Compatibility Mode features compatibility with the Centronics interface popular among the existing PCs. This is the initialization mode of the interface following the power-on sequence and also the printer reset. Under normal condition, the printer receives data from the host in this mode.

Data transmissions are proceeded as follows.

- The host checks that the printer has been ready for data acception then sends data and the Strobe signal.
- Upon detection of Strobe signal from the host, the printer responds by setting Busy high to receive transmitted data.
- After completion of data reception, the printer sends the nAck LOW pulse signal and sets the Busy signal low.

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## L.2.3.2 Handshaking



Figure L.2.3.1 Compatibility Mode handshake

Parameter	Request for printer Symbol Specifications on the printer Sp		Request for host Specifications on the host		
		Minimum	Maximum	Minimum	Maximum
Data hold time (host)	tHold-1	—	500	_	—
Data hold time (printer)	tHold-2	—	_	750	—
Data setup time	tSetup	_	500	750	_
STROBE pulse width	tSTB	_	500	750	500 s
READY cycle idle time	tReady	_	_	0	
BUSY output delay time	tBUSY	0	500	_	
Data processing time	tReply	0		_	
ACKNLG pulse width	tACK	500	10 s	_	_
BUSY release time	tnBUSY	0		—	_
ACK cycle idle time	tNext	—	0	0	—

Table L.2.3.1	Compatibility	Mode	handshake	timing	values
				<u> </u>	

\* The printer latches data at a falling edge of nStrobe.

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## L.2.4 Negotiation

### L.2.4.1 Description

Normally the printer starts with Compatibility Mode in which it is Centronics interface compliant. In an attempt to transit to Nibble/Byte Mode, the printer proceeds with negotiation in response to the host request. Negotiation is proceeded as follows.

- 1) The host sets 1284-Active high to allow the interface to go to the Negotiation Phase.
- 2) The printer reports to the host whether or not it is ready to perform the host-requested mode.
- 3) The Negotiation Phase is terminated, changing to the communication phase.

### L.2.4.2 Negotiation procedures

Negotiation is proceeded as follows.

- In the 1284 Communication Mode, the default mode for the host and the printer is Compatibility Mode. The Compatibility Mode remains active until the host has successfully verified that it is connected to a 1284 Compatible Device.
- 2) To begin the negotiation, the host places the communication mode request bit on the data bus (event 0).
- 3) The host sets 1284-Active(nSelectIn) high and HostBusy(nAutoFd) low (event 1).4)The printer responds by setting PtrClk(nAck) low, nDataAvail(nFault) high, Xflag(Select) high, and AckDataReq(PError) high (event 2).
- 5) The host sets HostClk(nStrobe) low, allowing the printer to latch the communication request bit data (event 3).
- 6) The host sets HostClk(nStrobe) and HostBusy(nAutoFd) high (event 4).
- 7) When the printer has any data to transmit to the host, it sets AckDataReq(PError) low, and nDataAvail(nFault) low then Xflag(Select) to its appropriate value as listed below for the communication mode (event 5).

Xflag: Low for Nibble Mode High for Byte Mode

- 8) The printer sets PtrClk(nAck) high, indicating that it is ready to accept the other status lines (event 6).
- 9) When the printer has any data to transmit to host, the host enters the HostBusy Data Available Phase, otherwise it enters the Termination Phase and returns to the Compatibility Mode.
- 10) When the printer has no data to transmit to the host, the host enters the HostBusy Data Not Available Phase, otherwise it enters the Termination Phase and returns to the Compatibility Mode.
- 11) If the printer fails to support the communication mode requested by the host, it responds by setting Xflag(Select) as follows.

For request for Nibble Mode: High For request for Byte Mode: Low

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### L.2.4.3 Notes

- 1) The start of negotiation phase shall be defined with 1284-Active triggered.
- 2) The timing to start negotiation in the Compatibility Mode shall be in principle after nAck pulse has been developed following nStrobe.

Upon detection of 1284-Active before or during the output of nAck after nStrobe , the interface enters the negotiation phase. In this case, when the termination is followed by the Compatibility Mode, nAck pulse is not developed.

- Negotiation is available from Busy or Error state in the Compatibility Mode. In this case, the termination fails to lead to the original Busy or Error state but to the printer status after termination.
- 4) If the printer fails to support the communication mode requested by the host, the host shall enter the Termination phase then return to the Compatibility Mode. (Refer to G.2.4.2.)

		Valid		Xflag	Xflag
Bit	Definition	Bit values	Hex Code	Values when	Values on the
				supported	printer
7	Request Extensibility Link	10000000	80H	High	Low
6	Request EPP Mode	01000000	40H	High	Low
5	Request ECP Mode with RLE	00110000	30H	High	Low
4	Request ECP Mode	00010000	10H	High	Low
3	Reserve	00001000	08H	High	Low
2	Request Device ID; Return Data Using				
	Nibble Mode Rev Channel Transfer	00000100	04H	High	High
	Byte Mode Rev Channel Transfer	00000101	05H	High	High
	ECP Mode Transfer without RLE	00010100	14H	High	Low
	ECP Mode Transfer with RLE	00110100	34H	High	Low
1	Reserve	00000010	High	Low	
0	Byte Mode Reverse Channel Transfer	00000001	01H	High	High
non	Nibble Mode Reverse Channel Transfer	00000000	00H	Low	Low
	Illegal or Contradictory Request	Other than above cases	Other than above cases		Low

 Table J.2.4.1
 1284 Communication Mode Request values-bit assignments

\* The printer is designed to work with only Nibble/Byte and thus it responds with negative Xflag values for request for the other modes.

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## L.2.5 Printer to Host Transfer Modes

#### L.2.5.1 Nibble Mode

Data transmissions from the printer to the host is proceeded as follows. The steps beginning with 1) apply to the transition from the Negotiation phase to the Host Busy Data Available phase. To the transition from the Negotiation phase to the Host Busy Data Not Available phase, the steps shall start with 9).

- 1) After negotiating to the Nibble Mode, the host will set HostBusy(nAutoFd) low to indicate it is ready to accept data from the printer (event 7).
- 2) The printer responds by placing the lower four bits on the Reverse channel data lines then sets PtrClk(nAck) low (event 8, event 9).
- 3) The host latches data in the event 9 then sets HostBusy(nAutoFd) high signaling to the printer that it has received the data (event 10).
- 4) The printer sets PtrClk(nAck) high completing the first nibble handshake (event 11).
- 5) The steps 1) through 3) are repeated for the upper four bits transmission, followed by the steps follow.
- 6) The host sets HostBusy(nAutoFd) high (event 10) to receive data, after which the printer shall set the four status lines as follows (event 13).
  - PtrBusy(Busy): To its current forward channel value.
  - nDataAvail(nFault): Low if another byte is ready to be sent.
  - AckDataReq(PError): To the same value as nDataAvail(nFault).
  - Xflag(Select): To the current mode status or low.
- 7) The printer sets PtrClk(nAck) high (event 11).
- 8) Following the event 11, based on the signals set by the printer in the event 13, the host examines the status lines to determine if;
  - Another printer to host byte is available,
  - and The host to the printer data transmission is possible.
- 9) At the end of a byte transfer, two nibbles, the host is allowed three options as listed below when the printer has no more data to transmit to the host.
  - 1. To proceed with termination and return to Compatibility Mode,
  - 2. To remain in the Host Busy Data Not Available phase, or
  - 3. To set HostBusy(nAutoFd) low (event 7) then put the interface into the Rev. Idle phase.
- 10) When the printer has any additional data to transmit to the host, the host is provided with three options as listed below.
  - 1. To set HostBusy(nAutoFd) low, indicating that the host is ready to accept additional data,
  - 2. To remain in the Host Busy Data Available phase, or
  - 3. To proceed with termination and return to Compatibility Mode.
- 11) When the host sets HostBusy(nAutoFd) low in the Host Busy Data Available phase, the printer repeats the steps starting with 2).

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- 12) Whenever the printer generates data for the host in the Reverse Idle phase, it sets PtrClk low to request an interrupt from the host (event 18).
- 13) Then, the printer sets PtrClk high (event 19).
- 14) The host responds to the interrupt requested by the printer by setting HostBusy(nAutoFd) high (event 20).
- 15) The printer then sets AckDataReq(PError) low to acknowledge the host s response, followed by the transition of the interface to the Host Busy Data Available phase (event 21).

#### L.2.5.2 Byte Mode

Data transmissions from the printer to the host are proceeded as described below. The steps starting with 1) apply to the transition to the Host Busy Data Available phase in the negotiation. To the transition to the Host Busy Data Not Available phase in the negotiation, the steps shall start from 9).

- 1) After negotiating to the Byte Mode, the host will place the data line in a high impedance state (event 14) then set HostBusy(nAutoFd) low (event 7) to indicate that it is ready to accept data from the printer.
- 2) The printer responds by placing the communication data on the data line (event 15).
- 3) The printer then sets PtrClk(nAck) low (event 9).
- 4) The host latches data in the event 9 then sets HostBusy(nAutoFd) high, indicating that it is processing the data(event 10).
- 5) At this point, the printer shall respond by setting the status line as follows (event 13).
  - PtrBusy(Busy): To its current forward channel value
  - nDataAvail(nFault): Low if another byte is ready to be sent
  - AckDataReq(PError): To the same value as nDataAvail(nFault)
  - Xflag(Select): To its value during the last negotiation or low
- 6) The printer then sets PtrClk(nAck) high, completing the byte handshake (event 11).
- 7) At this point, the host will pulse HostClk(nStrobe) low (event 16), then high (event 17), signaling that it has received the byte.
- 8) Note that the events 10 and 16 may occur simultaneously, and the events 7 and 17 may occur simultaneously (in such cases in which HostBusy and HostClk are set equivalent).
- 9) At the end of a byte transfer, the printer reports to the host whether or not it has additional data to transmit to the host. When the printer has no more data, the host is allowed three options as listed below.
  - 1. To proceed with termination and return to Compatibility Mode.
  - 2. To remain in the Host Busy Data Not Available phase.
  - 3. To set HostBusy(nAutoFd) low then put the interface into the Reverse Idle phase (event 7).

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- 10) When the printer has any additional data, the host is provided with three options as listed below.
  - 1. To set HostBusy(nAutoFd) low, indicating that the host is ready to accept additional data.
  - 2. To remain in the Host Busy Data Available phase.
  - 3. To proceed with termination and return to Compatibility Mode.

The procedures to start data transmissions from the Reverse Idle phase are same as in the Nibble Mode.

#### L.2.6 Device ID

Device ID is a string of characters to identify a device connected through the interface.

The printer will respond to the request by the host for the Device ID with the following Device ID.

<00>h<31>h MFG: EPSON; CMD: ESC/POS; MDL: TM-P1.00; CLS: PRINTER;

The first two bytes indicate the length of the entire Device ID including those two bytes.

For request of Device ID, refer to the section under "Negotiation."

The host is required to accept a complete string of Device ID having a length indicated by the first two bytes and it is not allowed to terminate the Device ID reception in progress until the entire Device ID is received. If the host terminates the Device ID transfer before all bytes have been transferred, the printer will discard the remainder of the Device ID string. Then, when the host requests Device ID again, the printer sends the ID from the beginning.

Once the host has received a complete string of Device ID having a length indicated by the first two bytes, it shall proceed with termination even if the printer has more data to transmit to the host (Data Available). If the host attempts to accept additional data without termination, the printer status will be sent. J.2.7

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## L.2.7 Termination

Termination refers to the processing to return to the Compatibility Mode from either Nibble or Byte Mode.

To terminate either the Nibble or Byte Mode, the host must take the following actions.

- To set 1284-Active(nSelectIn) low.
- To set HostBusy(nAutoFd) high (event 22).
- Termination is available in two types.
- Handshake between the host and the printer
- 2 Immediate termination

In the case of ①, on the condition that, in the process of transition from Reverse Mode to Compatibility Mode, the event 22 has been completed while the interface is active (with 1284-Active set high);

- 1) The printer responds to the 1284-Active by setting PtrBusy(Busy) and nDataAvail(nFault) high (event 23).
- 2) The printer will then reverse Xflag(Select) and set PtrClk(nAck) low (event 24).
- 3) The host then sets HostBusy(nAutoFd) low (event 25).
- 4) The printer then sets nDataAvail(nFault), Xflag(Select) and AckDataReq(PError) back to the status in the Compatibility Mode (event 26) and sets PtrClk(nAck) high (event 27).
- 5) The host completes the termination handshake by setting HostBusy(nAutoFd) high, returning the interface to the Compatibility Mode Idle phase (event 28).
- 6) The printer then changes PtrBusy(Busy) to be ready to accept data from the host.

In the case of @, the printer proceeds to immediate termination whenever the interface becomes inactive (with 1284-Active set low) by omitting the event 22. In this termination, data integrity is not guaranteed and the printer will switch the data line from output to input in 1 s.

In the Reverse Idle phase, the printer is allowed to report to the host that it has any data to transmit to the host. This may occur in conjunction with termination because the host changes from the Idle phase to the Compatibility Mode.

The printer will start the Interrupt phase provided in the events 8 and 9 when it has data to transmit to the host. At this point, when 1284-Active(nSelectIn) becomes low before HostBusy(nAutoFd) changes from a high to a low state, the printer will judge that the host has entered the Termination phase and that it proceeds to the normal termination handshake.

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## L.2.8 Interface Operation Timing Chart



Figure J.2.8.1 Nibble Mode Negotiation and Transfer

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Figure L.2.8.2 Byte Mode Negotiation and Termination

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Figure L.2.8.3 Byte Mode Negotiation and Transfer

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Figure L.2.8.4 Nibble Mode Transfer and Termination

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Figure L.2.8.5 Nibble Mode Interrupt and Transfer

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Figure L.2.8.6 Failed Negotiation

EPSON	TITLE TM - U375/U375P	SHEET REVISION	NO.	
	Specification (STANDARD)	С	NEXT END	SHEET App.38