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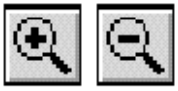

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CONFIDENTIAL

EPSON®

ESC/POS®
Information Manual

Guide to
TM-U590/U590P

SEIKO EPSON CORPORATION

Confidential

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Introduction

ESC/POS

The market for store automation equipment is changing rapidly with the widespread introduction of POS (point of sale) terminals. These terminals are now appearing even in small retail stores and specialty shops. They occupy a secure position in the range of applications available for personal computers.

As more personal computers come to be used as POS terminals, the demand for matching standardized peripheral devices is expected to rise. At present, however, many of the competing POS terminal printer displays on the market employ mutually incompatible command sets. This imposes limits on the expandability and range of applications possible with PC-based systems. There is a need for a new command set designed to provide the expandability and universal applicability demanded by the market.

To meet this need, Seiko Epson Corporation proposes the adoption of a newly developed command set to standardize POS terminal peripheral devices: ESC / POS (Epson Standard Code for Point of Sale).

The aim when developing ESC / POS was to create a set of control codes that could be used to operate any output device connected to a POS terminal. These new codes are intended to replace the mutually incompatible command sets previously in use.

TM / DM series models already support ESC / POS, and they have been evaluated highly in the marketplace.

Seiko Epson Corporation plans to produce new models in the TM / DM series offering ESC / POS support and to continue to work for the standardization of the entire POS environment to promote the dissemination of ESC / POS.

About This Manual

- **Chapter 1** contains a table of supported commands, descriptions of all the commands arranged by function with program examples and print samples, and character code tables.
- **Chapter 2** contains an example showing several commands used in a program for issuing a coupon containing bar codes.
- **Chapter 3** contains a table of the commands listed by function type and a table showing which commands are supported by various EPSON printers.

Features

The TM-U590 / U590P is a high-quality POS printer that can print on slip paper. This specification applies the following models of the TM-U590 series printer.

The printer has the following features:

- ❏ Wide slip paper capability (maximum characters per line: 88 with 7 × 9 font).
- ❏ Copy printing is possible.
- ❏ Optional Magnetic Ink Character Recognition (MICR) reader that enables the printer to perform consecutive reading and processing of MICR characters and printing endorsements.
- ❏ High throughput using bidirectional, minimum distance printing.
- ❏ EPSON customer display series connection (DM-D).
- ❏ Command protocol based on the ESC / POS™ standard.
- ❏ Automatic Status Back (ASB) function that automatically transmits changes in the printer status.
- ❏ Selectable receive buffer size (69 bytes or 4K bytes).

Options

- ❏ EPSON power supply unit, PS-170.
- ❏ MICR reader (factory-installed option).
- ❏ Direct connection customer display (DM-D102 / DM-D203).

Specifications

- ❑ Printing specifications

Printing method:	Serial impact dot matrix
Head wire configuration:	9-pin vertical line, wire pitch 1/72 inch
Head wire diameter:	0.29 mm (.01”)
Printing direction:	Bidirectional, minimum distance printing
Printing speed:	Up to 233 characters per second [Font A (9x9)]
	Up to 311 characters per second [Font B (7x9)]

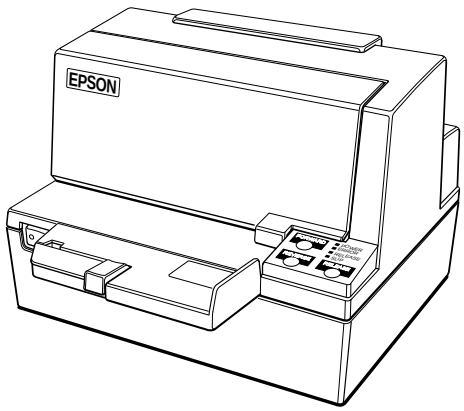
- ❑ Character specifications

Number of characters:	Alphanumeric characters: 95
	International characters: 32
	Extended graphics: 128 × 7 pages (including one space page)
Character structure:	Font A: 9 × 9 3-dot spacing (in half dot units)
	Font B: 7 × 9 2-dot spacing (in half dot units)
	Larger spacing can be changed by using **ESC SP**.
Characters per line:	66 [Font A (9x9)] / 88 [Font B (7x9)]
Characters per inch:	12.5 [Font A (9x9)] / 16.7 [Font B(7x9)]
Character size:	1.6 (W) x 3.1 (H) mm [Font A (9x9)]
	1.3 (W) x 3.1 (H) mm [Font B (7x9)]

- ❑ Paper size: 70 mm x 70 mm to 210 mm x 297 mm (A4)

- ❑ Interface: RS-232 (serial interface)
  IEEE 1284 (parallel interface)
  RS-485 (dealer option)

- ❑ Receive buffer: 4k or 69 byte (selectable by DIP switch)



Chapter 1

Command Descriptions

Following this table are all the commands organized by function and described with program examples and print samples. The print samples are images of the printing results of the program examples; they do not represent actual printing.

Supported Commands

Command	Name	Function Type	Page Number
HT	Horizontal tab	Print position	1-23
LF	Print and line feed	Print	1-4
FF	Print and eject cut sheet	Print	1-7
CR	Print and carriage return	Print	1-4
DLE EOT	Real-time status transmission	Status	1-32
DLE ENQ	Real-time request to printer	Miscellaneous function	1-45
ESC SP	Set right-side character spacing	Character	1-10
ESC !	Select print mode(s)	Character	1-15
ESC $	Set absolute print position	Print position	1-22
ESC %	Select/cancel user-defined character set	Character	1-11
ESC &	Define user-defined characters	Character	1-11
ESC ✻	Select bit-image mode	Bit image	1-25
ESC –	Turn underline mode on/off	Character	1-16
ESC 2	Select default line spacing	Line spacing	1-8
ESC 3	Set line spacing	Line spacing	1-8
ESC <	Return home	Mechanism control	1-36
ESC =	Select peripheral device	Miscellaneous function	1-44
ESC ?	Cancel user-defined characters	Character	1-12
ESC @	Initialize printer	Miscellaneous function	1-42
ESC C	Set cut sheet eject length	Line spacing	1-9
ESC D	Set horizontal tab positions	Print position	1-23
ESC E	Turn emphasized mode on/off	Character	1-16
ESC F	Set/cancel cut sheet reverse eject	Mechanism control	1-37
ESC G	Turn double-strike mode on/off	Character	1-17
ESC J	Print and feed paper	Print	1-5
ESC K	Print and reverse feed	Print	1-5
ESC R	Select an international character set	Character	1-13
ESC U	Turn unidirectional printing mode on/off	Mechanism control	1-36

Command	Name	Function Type	Page Number
**ESC **	Set relative print position	Print position	1-22
ESC a	Select justification	Print position	1-23
ESC c 3	Select paper sensor(s) to output paper-end signals	Paper sensor	1-20
ESC c 4	Select paper sensor(s) to stop printing	Paper sensor	1-20
ESC c 5	Enable/disable panel buttons	Panel button	1-19
ESC d	Print and feed ***n*** lines	Print	1-6
ESC e	Print and reverse feed ***n*** lines	Print	1-7
ESC f	Set cut sheet wait time	Printing paper	1-18
ESC p	Generate pulse	Miscellaneous function	1-44
ESC q	Paper release	Mechanism control	1-37
ESC t	Select character code table	Character	1-14
ESC {	Turn upside-down printing mode on/off	Character	1-18
GS !	Select character size	Character	1-17
GS *	Define downloaded bit image	Bit image	1-26
GS /	Print downloaded bit image	Bit image	1-27
GS I	Transmit printer ID	Miscellaneous function	1-43
GS L	Set left margin	Print position	1-24
GS P	Set horizontal and vertical motion units	Miscellaneous function	1-41
GS W	Set printing area width	Print position	1-24
GS a	Enable/disable Automatic Status Back (ASB)	Status	1-29
GS r	Transmit status	Status	1-31

The following commands are supported only by the TM-U590/U590P with the optional Magnetic Ink Character Recognition (MICR) reader. (The MICR reader is a factory-installed option.)

Command	Name	Function Type	Page Number
DLE EOT BS	Real-time MICR status transmission	Status	1-35
FS a 0	Read check paper	MICR	1-38
FS a 1	Load check paper to print starting position	MICR	1-40
FS a 2	Eject check paper	MICR	1-40
FS b	Request retransmission of check paper reading result	MICR	1-39
FS c	MICR mechanism cleaning	MICR	1-38

Using Bit Value Tables

For each command that has a complex method of determining the variable ***n***, there is a table showing how to calculate the variable in three numbering systems: binary, hexadecimal, and decimal.

When you look at the table, first find the value of each component of the variable. Then add the values of the components together to determine the value of the variable ***n***.

For example, here is how you would use the table below, which selects the print mode, to combine double height, double width, and underline. In the table, you see that bit 4 on (or hex 10 or decimal 16) turns on double height, bit 5 on (or hex 20 or decimal 32) turns on double width, and bit 7 on (or hex 80 or decimal 128) turns on underline mode.

To combine all three, turn on bits 4, 5, and 7, which is 10110000 in binary. Or you can add the hex values 10, 20, and 80 for the hex sum of B0, or you can add the decimal values 16, 32, and 128 for the decimal value of 176.

Therefore, you send the following to turn on double height, double width, and underline, depending on the numbering system used:

ASCII	ESC	!	*n*
Hex	1B	21	B0
Decimal	28	33	176

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Character font A selected.
	On	01	1	Character font B selected.
1, 2	—	—	—	Undefined.
3	Off	00	0	Emphasized mode not selected.
	On	08	8	Emphasized mode selected.
4	Off	00	0	Double-height mode not selected.
	On	10	16	Double-height mode selected.
5	Off	00	0	Double-width mode not selected.
	On	20	32	Double-width mode selected.
6	—	—	—	Undefined.
7	Off	00	0	Underline mode not selected.
	On	80	128	Underline mode selected.

Note that the program examples throughout this chapter use decimal numbers, but binary, decimal, and hexadecimal numbers all have the same printing results.

Print Commands

The TM-U590/U590P supports the following commands for printing characters and advancing paper.

Command	Name
LF	Print and line feed
CR	Print and carriage return
ESC J	Print and feed paper
ESC K	Print and reverse feed
ESC d	Print and feed ***n*** lines
ESC e	Print and reverse feed ***n*** lines
FF	Print and eject cut sheet

LF

[Name] Print and line feed

[Format] ASCII LF

Hex 0A

Decimal 10

LF prints the data in the print buffer and feeds one line. The amount of paper fed per line is based on the value set using the line spacing command. The default setting is 1/6 inch.

Program Example

```
PRINT #1, "AAAAA"; CHR$(&HA);
PRINT #1, "BBBBB"; CHR$(&HA);
```

Print Sample

```
AAAAA
BBBBB
```

CR

[Name] Print and carriage return

[Format] ASCII CR

Hex 0D

Decimal 13

When auto line feed is enabled, **CR** functions in the same way as **LF**. When auto line feed is disabled, **CR** prints the data in the print buffer and does not feed the paper. With a serial interface, auto line feed is disabled. With a parallel interface, whether enabling or disabling the auto line feed can be selected by DIP switch 1-1.

Program Example

```
PRINT #1, "AAAAA"; CHR$(&HD);
PRINT #1, "     BBBBB"; CHR$(&HA);
```

Print Sample

```
AAAAA
     BBBBB     ←Auto line feed enabled
AAAAABBBBB     ←Auto line feed disabled
```

ESC J *n*

[Name] Print and feed paper

[Format]				
	ASCII	ESC	J	*n*
	Hex	1B	4A	*n*
	Decimal	27	74	*n*

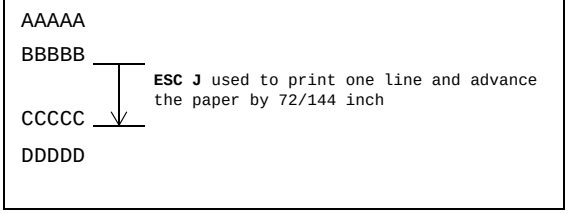
[Range] $0 \le n \le 255$

ESC J *n* prints the data in the print buffer and feeds the paper ***n*** × vertical motion unit. This command is used to temporarily feed a specific length without changing the line spacing set by other commands. The maximum paper feed amount is 40 inches. The vertical motion unit set by **GS P** is used. The default value of the vertical motion unit is 1 / 144 inch.

Program Example

```
PRINT #1, CHR$(&H1D);"P";CHR$(150);CHR$(144);
PRINT #1, "AAAAA"; CHR$(&HA);
PRINT #1, "BBBBB"; CHR$(&H1B);"J";CHR$(72);
PRINT #1, "CCCCC"; CHR$(&HA);
PRINT #1, "DDDDD"; CHR$(&HA)
```

Print Sample



ESC K *n*

[Name] Print and reverse feed

[Format]				
	ASCII	ESC	K	*n*
	Hex	1B	4B	*n*
	Decimal	27	75	*n*

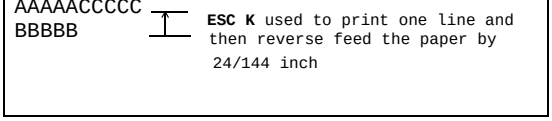
[Range] $0 \le n \le 255$

ESC K *n* prints the data in the print buffer and feeds the paper ***n*** × vertical motion unit in the reverse direction. This command is used to temporarily feed a specific length without changing the line spacing set by other commands. In the reverse direction, the maximum paper feed amount is 40 inches. The vertical motion unit set by **GS P** is used. The default value of the vertical motion unit is 1 / 144 inch.

Program Example

```
PRINT #1, CHR$(&H1D);"P";CHR$(150);CHR$(144);
PRINT #1, "AAAAA"; CHR$(&HA);
PRINT #1, "BBBBB"; CHR$(&H1B);"K";CHR$(24);
PRINT #1, "     CCCCC"; CHR$(&HA);
```

Print Sample



ESC d *n*

[Name] Print and feed ***n*** lines

[Format]				
	ASCII	ESC	d	*n*
	Hex	1B	64	*n*
	Decimal	27	100	*n*

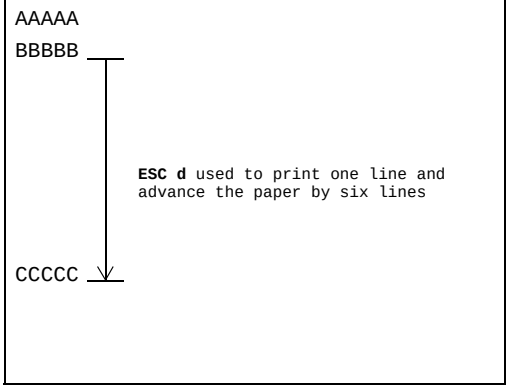
[Range] $0 \le n \le 255$

ESC d *n* prints the data in the print buffer and feeds ***n*** × line spacing. The amount of paper fed per line is based on the value set using **ESC 2** or **ESC 3**. The maximum paper feed amount is 40 inches. The default setting of the paper feed amount is 1/6 inch.

Program Example

```
PRINT #1, "AAAAA"; CHR$(&HA);
PRINT #1, "BBBBB"; CHR$(&H1B);"d";CHR$(6);
PRINT #1, "CCCCC"; CHR$(&HA);
```

Print Sample



ESC e *n*

[Name] Print and reverse feed ***n*** lines

[Format]				
	ASCII	ESC	e	*n*
	Hex	1B	65	*n*
	Decimal	27	101	*n*

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

ESC e *n* prints the data in the print buffer and feeds ***n*** × line spacing in the reverse direction. The amount of paper fed per line is based on the value set using **ESC 2** or **ESC 3**. The maximum reverse paper feed amount is 40 inches. The default setting of the paper feed amount is 1/6 inch.

Program Example

```
PRINT #1, "AAAAA"; CHR$(&HA);
PRINT #1, "BBBBB"; CHR$(&H1B);"e";CHR$(1);
PRINT #1, "     CCCCC"; CHR$(&HA);
```

Print Sample

```
AAAAACCCCC
BBBBB
```

Paper reverse fed one line after printing the line of Bs

FF

[Name] Print and eject cut sheet

[Format]		
	ASCII	FF
	Hex	0C
	Decimal	12

FF prints the data in the print buffer and ejects the slip paper. The amount of paper fed is based on the value set using **ESC C**. The slip is ejected in the direction specified by **ESC F**.

Program Example

```
PRINT #1, "AAAAA"; CHR$(&HA);
PRINT #1, "BBBBB"; CHR$(&HC);
```

Print Sample

```
AAAAA
BBBBB

Eject the sheet
```

Line Spacing Commands

The TM-U590/U590P supports the following commands for setting line spacing. These commands only set the line spacing; they do not actually advance the paper. The line spacing set using these commands affects the results of **LF**, or **ESC d**, or **FF** is executed and paper feed using the FORWARD or REVERSE button.

Command	Name
ESC 2	Select default line spacing
ESC 3	Set line spacing
ESC C	Set cut sheet eject length

ESC 2

[Name]	Select default line spacing		
[Format]	ASCII	ESC	2
	Hex	1B	32
	Decimal	27	50

ESC 3 *n*

[Name]	Set line spacing			
[Format]	ASCII	ESC	3	*n*
	Hex	1B	33	*n*
	Decimal	27	51	*n*
[Range]	$0 \le n \le 255$			

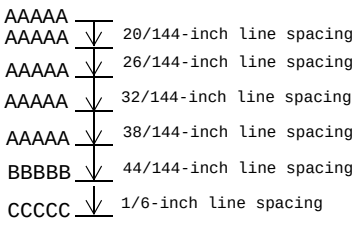
ESC 2 sets the line spacing to 1/6 inch. This is equivalent to 12 dots.

ESC 3 ***n*** sets the line spacing to ***n*** × vertical motion unit. The default setting of the paper feed amount is 1/6 inch (***n*** = 24). The maximum line spacing amount is 40 inches. The vertical motion unit set by **GS P** is used. The default setting of the vertical motion unit is 1/144 inch.

Program Example

```
PRINT #1, CHR$(&H1D);"P";CHR$(150);CHR$(144);
FOR n=20 TO 44 STEP 6
  PRINT #1, CHR$(&H1B);"3";CHR$(n); ← Set line spacing
  PRINT #1, "AAAAA"; CHR$(&HA);
NEXT n
PRINT #1, CHR$(&H1B);"2"; ← Set the default
PRINT #1, "BBBBB"; CHR$(&HA);
PRINT #1, "CCCCC"; CHR$(&HA);
```

Print Sample



ESC C *n*

[Name]	Set cut sheet eject length			
[Format]	ASCII	ESC	C	*n*
	Hex	1B	43	*n*
	Decimal	27	67	*n*
[Range]	$0 \le n \le 255$			

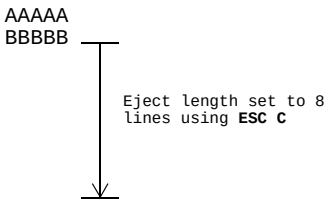
ESC C *n* sets the eject length for slip paper to ***n*** × line spacing. The maximum eject length is 17.72 inches. The default setting of the eject length is ***n*** = 0. No eject length is set if ***n***=0. When ***n***=0, the paper is fed until it can be ejected.

If the printer cannot detect the edge of the sheet after feeding the sheet for maximum value (17.72 inches), it is a slip ejection error (recoverable error).

Program Example

```
PRINT #1, CHR$(&H1B);"C";CHR$(8); ← Set eject length
PRINT #1, "AAAAA"; CHR$(&HA);
PRINT #1, "BBBBB"; CHR$(&HC);
```

Print Sample



Character Commands

The TM-U590/U590P supports the following commands for setting character font and size:

Command	Name
ESC SP	Set right-side character spacing
ESC %	Select/cancel user-defined character set
ESC &	Define user-defined characters
ESC ?	Cancel user-defined characters
ESC R	Select an international character set
ESC t	Select character code table
ESC !	Select print mode(s)
ESC –	Turn underline mode on/off
ESC E	Turn emphasized mode on/off
ESC G	Turn double-strike mode on/off
GS !	Select character size
ESC {	Turn upside-down printing mode on/off

ESC SP *n*

[Name]	Set right-side character spacing			
[Format]	ASCII	ESC	SP	*n*
	Hex	1B	20	*n*
	Decimal	27	32	*n*
[Range]	$0 \le n \le 255$			

ESC SP *n* sets the right-side character spacing to ***n*** × horizontal motion unit. It is used to change the spacing between characters. The default setting is ***n***=0. The horizontal motion unit set by **GS P** is used. The default setting of the horizontal motion unit is 1/150 inch.

Program Example

```
PRINT #1, CHR$(&H1D);"P";CHR$(150);CHR$(144);
PRINT #1, CHR$(&H1B);" ";CHR$(0); ← Character spacing set to 0
PRINT #1, "AAAAA"; CHR$(&HA);
PRINT #1, CHR$(&H1B);" ";CHR$(6); ← Character spacing set to 6
PRINT #1, "BBBBB"; CHR$(&HA);
PRINT #1, CHR$(&H1B);" ";CHR$(12); ← Character spacing set to 12
PRINT #1, "CCCCC"; CHR$(&HA);
```

Print Sample

```
AAAAA ← 0-inch right-side character spacing
BBBBB ← 6/150-inch right-side character spacing
C C C C C  ← 12/150-inch right-side character spacing
```

ESC % *n*

[Name]	Select / cancel user-defined character set			
[Format]	ASCII	ESC	%	*n*
	Hex	1B	25	*n*
	Decimal	27	37	*n*
[Range]	$0 \le n \le 255$			

ESC & *y c1 c2 [x1 d1 ... d(y × x1)] ... [xk d1 ... d(y × xk)]*

[Name]	Define user-defined characters			
[Format]	ASCII	ESC	&	*y c1 c2 [x1 d1 ... d(y × x1)] ... [xk d1 ... d(y × xk)]*
	Hex	1B	26	*y c1 c2 [x1 d1 ... d(y × x1)] ... [xk d1 ... d(y × xk)]*
	Decimal	27	38	*y c1 c2 [x1 d1 ... d(y × x1)] ... [xk d1 ... d(y × xk)]*
[Range]	$y = 2$			
	$32 \le c1 \le c2 \le 126$			
	$0 \le x \le 12$ (for the fontA)			
	$0 \le x \le 9$ (for the fontB)			
	$0 \le d1 \ldots d(y \times xk) \le 255$			
	$k = c2\text{-}c1+1$			

ESC ? *n*

[Name]	Cancel user-defined characters			
[Format]	ASCII	ESC	?	*n*
	Hex	1B	3F	*n*
	Decimal	27	63	*n*
[Range]	$32 \le n \le 126$			

ESC % *n* selects or cancels the user-defined character set. When the LSB (least significant bit) of ***n*** is 1, the user-defined character set is selected. When it is 0, the internal character set is selected; this is the default setting.

ESC & *y c1 c2 [x1 d1 ... d(y × x1)] ... [xk d1 ... d(y × xk)]* defines user-defined characters from character code ***c1*** to ***c2***. ***y*** and ***x*** are the configuration of a user-defined character. ***y*** specifies the number of bytes in the vertical direction. ***x*** specifies the number of dots in the horizontal direction. Character codes from the alphanumeric characters (20H (decimal 32) to 7EH (decimal 126)) can be defined by ***c1*** and ***c2***. Data (***d***) specifies a bit printed to 1 and not printed to 0. The most significant bit is available for even number of bits of ***d***. Adjacent dots cannot be set. As the default, user-defined characters are not defined and the internal character set is printed. Once the user-defined characters have been defined, they are available until **ESC ?**, or **GS ✻**, or **ESC @** is executed; the user-defined characters are redefined; the power is turned off; or the printer is reset. When this command is executed, the downloaded bit image is cleared.

ESC ? *n* cancels the user-defined characters defined for the character code ***n***. After the user-defined characters are canceled, the internal character set is printed.

Program Example

```
y=2
PRINT #1, CHR$(&H1B);"&";CHR$(y);"AC";
x=9: PRINT #1, CHR$(x);
FOR i=1 TO y*x
  READ d: PRINT #1, CHR$(d);
NEXT i
x=9: PRINT #1, CHR$(x);
FOR i=1 TO y*x
  READ d: PRINT #1, CHR$(d);
NEXT i
x=9: PRINT #1, CHR$(x);
FOR i=1 TO y*x
  READ d: PRINT #1, CHR$(d);
NEXT i
PRINT #1, CHR$(&H1B);"%";CHR$(0); ← Select internal character
PRINT #1, "A B C D E"; CHR$(&HA);
PRINT #1, CHR$(&H1B);"%";CHR$(1); ← Select user-defined character
PRINT #1, "A B C D E"; CHR$(&HA):
PRINT #1, CHR$(&H1B);"?";"A"; ← Cancel the user-defined character
PRINT #1, "A B C D E"; CHR$(&HA);

DATA &H18,&H00,&H00,&H00,&H3C,&H00,&H00,&H00
DATA &H7E,&H00,&H00,&H00,&H3C,&H00,&H00,&H00
```

Defines the user-defined characters as "A","B",and "C"

Program Example (continued)

```
DATA &H18,&H00
DATA &H18,&H00,&H00,&H00,&H24,&H00,&H00,&H00
DATA &H42,&H00,&H00,&H00,&H24,&H00,&H00,&H00
DATA &H18,&H00
DATA &H10,&H00,&H20,&H00,&H5F,&H00,&H00,&H00
DATA &H81,&H00,&H00,&H00,&H5F,&H00,&H20,&H00
DATA &H10,&H00
```

Print Sample

```
A B C D E  ← Characters from internal character set
♦ ◊ ⇧ D E  ← Characters from user-defined character set
A ◊ ⇧ D E  ← Characters from user-defined character set (cancel
             one character)
```

ESC R *n*

[Name] Select an international character set

[Format]

ASCII	ESC	R	*n*
Hex	1B	52	*n*
Decimal	27	82	*n*

[Range] $0 \le n \le 10$

ESC R *n* selects an international character set ***n*** as follows. The default value is U.S.A. (***n***=0).

n	Country	ASCII code												
		Hex	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
		Dec	35	36	64	91	92	93	94	96	123	124	125	126
0	U.S.A.		#	$	@	[	\	]	^	`	{	¦	}	~
1	France		#	$	à	°	ç	§	^	`	é	ù	è	¨
2	Germany		#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
3	U.K.		£	$	@	[	\	]	^	`	{	¦	}	~
4	Denmark I		#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
5	Sweden		#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
6	Italy		#	$	@	°	\	é	^	ù	à	ò	è	ì
7	Spain		Pt	$	@	¡	Ñ	¿	^	`	¨	ñ	}	~
8	Japan		#	$	@	[	¥	]	^	`	{	¦	}	~
9	Norway		#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
10	Denmark II		#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü

Program Example

```
FOR n=0 TO 10
 PRINT #1, CHR$(&H1B);"R";CHR$(n);
 PRINT #1, "# $ @ [ \ ] ^ ` { ¦ } ~"; CHR$(&HA);
NEXT n
```

Print Sample

```
#  $  @  [  \  ]  ^  `  {  ¦  }  ~  ← n=0 (Default setting)
#  $  à  °  ç  §  ^  `  é  ù  è  ¨  ← n=1
#  $  §  Ä  Ö  Ü  ^  `  ä  ö  ü  ß  ← n=2
£  $  @  [  \  ]  ^  `  {  ¦  }  ~  ← n=3
#  $  @  Æ  Ø  Å  ^  `  æ  ø  å  ~  ← n=4
#  ¤  É  Ä  Ö  Å  Ü  é  ä  ö  å  ü  ← n=5
#  $  @  °  \  é  ^  ù  à  ò  è  ì  ← n=6
Pt $  @  ¡  Ñ  ¿  ^  `  ¨  ñ  }  ~  ← n=7
#  $  @  [  ¥  ]  ^  `  {  ¦  }  ~  ← n=8
#  ¤  É  Æ  Ø  Å  Ü  é  æ  ø  å  ü  ← n=9
#  $  É  Æ  Ø  Å  Ü  é  æ  ø  å  ü  ← n=10
```

ESC t *n*

[Name] Select character code table

[Format]

ASCII	ESC	t	*n*
Hex	1B	74	*n*
Decimal	27	116	*n*

[Range] $0 \le n \le 5$, $n = 255$

ESC t *n* selects a page ***n*** from the character code table as follows. The alphanumeric characters (20H (decimal 32) to 7FH (decimal 127)) are the same for each page. The extended characters (80H (decimal 128) to FFH (decimal 255)) are different for each page. The default setting is page 0 (***n***=0). For page 255, font A and font B support different characters.

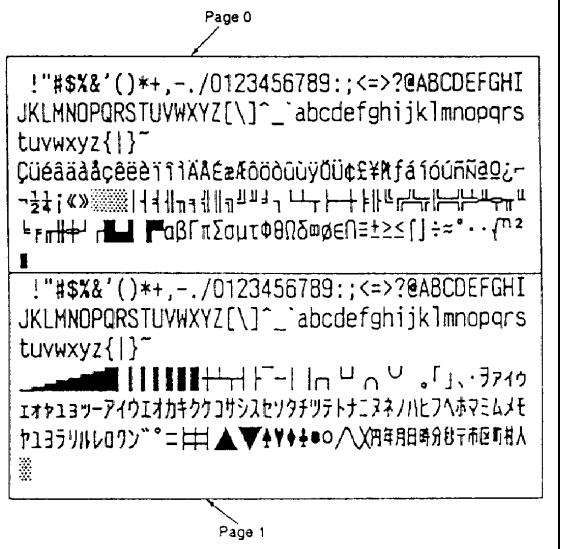
n	Character Code Table	
0	Page 0 [PC437 (U.S.A. , Standard Europe)]	
1	Page 1 [Katakana]	
2	Page 2 [PC850 (Multilingual)]	
3	Page 3 [PC860 (Portuguese)]	
4	Page 4 [PC863 (Canadian-French)]	
5	Page 5 [PC865 (Nordic)]	
255	Page 255	Font A: Space
		Font B: Special Characters

Program Example

```
PRINT #1, CHR$(&H1D);"P";CHR$(150);CHR$(144);
PRINT #1, CHR$(&H1D);"W";CHR$(248);CHR$(1);
PRINT #1, CHR$(&H1B);"t";CHR$(0); ← Select page 0
GOSUB printing
PRINT #1, CHR$(&H1B);"t";CHR$(1); ← Select page 1
GOSUB printing
END

printing:
  FOR i=&H20 TO &H7F
    PRINT #1, CHR$(i);
  NEXT i
  PRINT #1, CHR$(&HA);
  FOR i=&H80 TO &HFF
    PRINT #1, CHR$(i);
  NEXT i
  PRINT #1, CHR$(&HA);
  RETURN
```

Print Sample



ESC ! *n*

[Name] Select print mode(s)

[Format]				
	ASCII	ESC	!	*n*
	Hex	1B	21	*n*
	Decimal	27	33	*n*

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

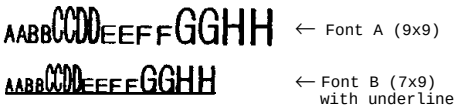
ESC ! *n* selects or cancels print modes collectively using ***n*** as follows. The default setting is ***n***=0.

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Character font A (9 x 9) selected.
	On	01	1	Character font B (7 x 9) selected.
1, 2	—	—	—	Undefined.
3	Off	00	0	Emphasized mode not selected.
	On	08	8	Emphasized mode selected.
4	Off	00	0	Double-height mode not selected.
	On	10	16	Double-height mode selected.
5	Off	00	0	Double-width mode not selected.
	On	20	32	Double-width mode selected.
6	—	—	—	Undefined.
7	Off	00	0	Underline mode not selected.
	On	80	128	Underline mode selected.

Program Example

```
PRINT #1, CHR$(&H1B);"U";CHR$(1); ← Select unidirectional
PRINT #1, CHR$(&H1B);"!";CHR$(0); "AA";
PRINT #1, CHR$(&H1B);"!";CHR$(8); "BB";
PRINT #1, CHR$(&H1B);"!";CHR$(16); "CC";
PRINT #1, CHR$(&H1B);"!";CHR$(24); "DD";
PRINT #1, CHR$(&H1B);"!";CHR$(32); "EE";
PRINT #1, CHR$(&H1B);"!";CHR$(40); "FF";
PRINT #1, CHR$(&H1B);"!";CHR$(48); "GG";
PRINT #1, CHR$(&H1B);"!";CHR$(56); "HH"; CHR$(&HA);
PRINT #1, CHR$(&H1B);"!";CHR$(129); "AA";
PRINT #1, CHR$(&H1B);"!";CHR$(137); "BB";
PRINT #1, CHR$(&H1B);"!";CHR$(145); "CC";
PRINT #1, CHR$(&H1B);"!";CHR$(153); "DD";
PRINT #1, CHR$(&H1B);"!";CHR$(161); "EE";
PRINT #1, CHR$(&H1B);"!";CHR$(169); "FF";
PRINT #1, CHR$(&H1B);"!";CHR$(177); "GG";
PRINT #1, CHR$(&H1B);"!";CHR$(185); "HH"; CHR$(&HA);
```

Print Sample




```
AA: Normal
BB: Emphasized
CC: Double-height
DD: Emphasized + Double-height
EE: Double-width
FF: Emphasized + Double-width
GG: Double-height + Double-width
HH: Emphasized + Double-height + Double-width
```

ESC – *n*

[Name] Turn underline mode on / off

[Format]	ASCII	ESC	–	*n*
	Hex	1B	2D	*n*
	Decimal	27	45	*n*

[Range] *n*=0, 1, 48, 49

ESC – *n* turns underline mode on or off. When ***n***=1 or 49, underline mode is turned on, and when ***n***=0 or 48, underline mode is turned off. The default setting is ***n***=0.

Program Example

```
PRINT #1, CHR$(&H1B);"-";CHR$(1); ← Select
PRINT #1, "AAAAA"; CHR$(&HA);
PRINT #1, CHR$(&H1B);"-";CHR$(0); ← Cancel
PRINT #1, "BBBBB"; CHR$(&HA);
```

Print Sample

AAAAA ← Underline turned on
BBBBB ← Underline turned off

ESC E *n*

[Name] Turn emphasized mode on / off

[Format]	ASCII	ESC	E	*n*
	Hex	1B	45	*n*
	Decimal	27	69	*n*

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

ESC E *n* turns emphasized mode on or off. When the LSB (least significant bit) of ***n*** is 1, emphasized mode is turned on; when it is 0, emphasized mode is turned off. The default setting is ***n***=0.

Program Example

```
PRINT #1, CHR$(&H1B);"E";CHR$(1); ← Select
PRINT #1, "AAAAA"; CHR$(&HA);
PRINT #1, CHR$(&H1B);"E";CHR$(0); ← Cancel
PRINT #1, "BBBBB"; CHR$(&HA);
```

Print Sample

AAAAA ← Emphasized
BBBBB ← Normal

ESC G *n*

[Name] Turn double-strike mode on / off

[Format]	ASCII	ESC	G	*n*
	Hex	1B	47	*n*
	Decimal	27	71	*n*

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

ESC G *n* turns double-strike mode on or off. When the LSB (least significant bit) of ***n*** is 1, double-strike mode is turned on; when it is 0, double-strike mode is turned off. The default setting is ***n***=0.

Program Example

```
PRINT #1, CHR$(&H1B);"G";CHR$(1); ← Select
PRINT #1, "AAAAA"; CHR$(&HA);
PRINT #1, CHR$(&H1B);"G";CHR$(0); ← Cancel
PRINT #1, "BBBBB"; CHR$(&HA);
```

Print Sample

AAAAA ← Double-strike
BBBBB ← Normal

GS ! *n*

[Name] Select character size

[Format]	ASCII	GS	!	*n*
	Hex	1D	21	*n*
	Decimal	29	33	*n*

[Range] *n*=0, 1, 16, 17

GS ! *n* selects the character height (vertical number of times normal font size) and the character width (horizontal number of times normal font size) using ***n***, as follows. The default setting is ***n***=0.

n	Character size	Height	Width
0	Normal	Normal	Normal
1	Double-height	Double	Normal
16	Double-width	Normal	Double
17	Quadruple	Double	Double

Program Example

```
PRINT #1, CHR$(&H1B);"U";CHR$(1); ← Select unidirectional
PRINT #1, CHR$(&H1D);"!";CHR$(17);
PRINT #1, "BBBBB"; CHR$(&HA);
PRINT #1, CHR$(&H1D);"!";CHR$(0);
PRINT #1, "AAAAA"; CHR$(&HA);
```

Print Sample

BBBBB ← Select quadruple (double height x double width)
AAAAA ← Normal

ESC { *n*

[Name]	Turn upside-down printing mode on / off			
[Format]	ASCII	ESC	{	*n*
	Hex	1B	7B	*n*
	Decimal	27	123	*n*
[Range]	$0 \le n \le 255$			

ESC { *n* turns upside-down printing mode on or off. When the LSB (least significant bit) of ***n*** is 1, upside-down printing mode is turned on; when it is 0, upside-down printing mode is turned off. The default setting is ***n***=0. This command is enabled only when processed at the beginning of the line. When upside-down mode is turned on, the printer prints 180°-rotated characters from right to left. The line printing order is not reversed; therefore be careful of the order of the data transmitted.

Program Example

```
PRINT #1, CHR$(&H1B);"{";CHR$(0); ← Cancel
GOSUB printing
PRINT #1, CHR$(&H1B);"{";CHR$(1); ← Select
GOSUB printing
END
printing:
  PRINT #1, "ABCDE"; CHR$(&HA);
  PRINT #1, "BCDEF"; CHR$(&HA);
  RETURN
```

Print Sample

Normal printing

ABCDE
BCDEF

ABCDE
BCDEF

Upside-down printing

Printing Paper Command

The TM-U590 / U590P supports the following command for controlling printing paper.

Command	Name
ESC f	Set cut sheet wait time

ESC f *t1 t2*

[Name]	Set cut sheet wait time				
[Format]	ASCII	ESC	f	*t1*	*t2*
	Hex	1B	66	*t1*	*t2*
	Decimal	27	102	*t1*	*t2*
[Range]	*t1*=0				
	$0 \le t2 \le 64$				

ESC f ***t1 t2*** sets the time from detection of the slip to the start of printing to ***t2*** × 0.1 seconds. ***t1*** is always set to 0 second. When ***t1***=0, the printer continues waiting for a slip to be inserted. The defaults are ***t1***=0, ***t2***=5. This setting alone, however, does not cause the printer to immediately start waiting for a slip to be inserted. The setting becomes effective when slip, check paper (only with the MICR reader), or cleaning sheet (only with the MICR reader) is used. **DLE ENQ** is used to cancel the check paper or cleaning sheet waiting state.

Program Example

```
PRINT #1, CHR$(&H1B);"f";CHR$(0);CHR$(20);
```

Panel Button Command

The TM-U590 / U590P supports the following command for enabling and disabling the panel buttons. (FORWARD, REVERSE, and RELEASE).

Command	Name
ESC c 5	Enable / disable panel buttons

ESC c 5 *n*

[Name]	Enable / disable panel buttons				
[Format]	ASCII	ESC	c	5	*n*
	Hex	1B	63	35	*n*
	Decimal	27	99	53	*n*
[Range]	$0 \le n \le 255$				

ESC c 5 ***n*** enables or disables the panel buttons. When the LSB (least significant bit) of ***n*** is 1, all buttons are disabled; when it is 0, all buttons are enabled. The default is ***n***=0. To prevent problems caused by accidentally pressing the buttons, use this command to disable the buttons. When the panel buttons are enabled by this command, if the cover is open, paper cannot be fed or released.

Program Example

```
PRINT #1, CHR$(&H1B);"c5";CHR$(1); ← Disable panel buttons
```

Paper Sensor Commands

The TM-U590 / U590P supports the following commands for controlling the paper sensor(s) that stop printing and output paper-end signals:

Command	Name
ESC c 4	Select paper sensor(s) to stop printing
ESC c 3	Select paper sensor(s) to output paper-end signals

ESC c 4 *n*

[Name] Select paper sensor(s) to stop printing

[Format]					
	ASCII	ESC	c	4	*n*
	Hex	1B	63	34	*n*
	Decimal	27	99	52	*n*

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

ESC c 4 *n* selects whether to stop printing or not when the paper runs out. The default setting is ***n***=0.

When the TOF sensor or the BOF sensor is enabled and a paper-end is detected, the printer ejects the paper after printing as much as possible and enters the paper waiting state. The printer is not off-line when printing stops due to a paper-end. When the TOF sensor or the BOF sensor is disabled and a paper-end is detected, the printer does not stop printing and eject the paper.

It is possible to select multiple sensors to stop printing. Then when any sensor detects a paper-end, printing stops.

The paper sensor(s) used to stop printing are selected by using ***n*** as follows:

Bit	Off/On	Hex	Decimal	Function
0-3	—	—	—	Undefined.
4	Off	00	0	TOF sensor disabled.
	On	10	16	TOF sensor enabled.
5	Off	00	0	BOF sensor disabled.
	On	20	32	BOF sensor enabled.
6-7	—	—	—	Undefined.

Program Example

```
PRINT #1, CHR$(&H1B);"c4";CHR$(16); ← Only TOF sensor enabled
```

ESC c 3 *n*

[Name] Select paper sensor(s) to output paper-end signals

[Format]					
	ASCII	ESC	c	3	*n*
	Hex	1B	63	33	*n*
	Decimal	27	99	51	*n*

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

ESC c 3 *n* selects whether to output paper-end signals or not to a parallel interface. When the TOF sensor or the BOF sensor is enabled and a paper-end is deleted, the paper-end signal is output. The default setting is (***n***=0).

When both of these sensors are selected to output signals and either one detects a paper-end, the paper-end signal is output. If both of these sensors are disabled, the paper-end signal is not output (always paper present status). This command is enabled only with a parallel interface and is ignored with a serial interface.

The paper sensor(s) used to output paper-end signals are selected by using ***n*** as follows:

Bit	Off/On	Hex	Decimal	Function
0-3	—	—	—	Undefined.
4	Off	00	0	TOF sensor disabled.
	On	10	16	TOF sensor enabled.
5	Off	00	0	BOF sensor disabled.
	On	20	32	BOF sensor enabled
6-7	—	—	—	Undefined.

Program Example

```
PRINT #1, CHR$(&H1B);"c3";CHR$(16); ← Only TOF sensor enabled
```

Print Position Commands

The TM-U590/U590P supports the following commands for setting the print position:

Command	Name
ESC $	Set absolute print position
**ESC **	Set relative print position
ESC a	Select justification
HT	Horizontal tab
ESC D	Set horizontal tab positions
GS L	Set left margin
GS W	Set printing area width

ESC $ *nL nH*

[Name]	Set absolute print position				
[Format]	ASCII	ESC	$	*nL*	*nH*
	Hex	1B	24	*nL*	*nH*
	Decimal	27	36	*nL*	*nH*
[Range]	$0 \le nL \le 255$				
	$0 \le nH \le 255$				

ESC \ *nL nH*

[Name]	Set relative print position				
[Format}	ASCII	ESC	\	*nL*	*nH*
	Hex	1B	5C	*nL*	*nH*
	Decimal	27	92	*nL*	*nH*
[Range]	$0 \le nL \le 255$				
	$0 \le nH \le 255$				

ESC $ *nL nH* sets the print starting position to (***nL*** + ***nH*** × 256) × horizontal motion unit from the left margin.

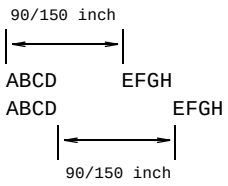
ESC \ *nL nH* moves the print starting position to (***nL*** + ***nH*** × 256) × horizontal motion unit from the current position. Use the complement of N for setting N pitch movement to the left:
(***nL*** + ***nH*** × 256) = 65536-N.

The horizontal motion unit set by **GS P** is used. The default setting of the horizontal motion unit is 1 / 150 inch.

Program Example

```
PRINT #1, CHR$(&H1D);"P";CHR$(150);CHR$(144);
PRINT #1, "ABCD";
PRINT #1, CHR$(&H1B);"$";CHR$(90);CHR$(0);
PRINT #1, "EFGH"; CHR$(&HA);
PRINT #1, "ABCD";
PRINT #1, CHR$(&H1B);"\";CHR$(90);CHR$(0);
PRINT #1, "EFGH"; CHR$(&HA);
```

Print Sample



ESC a *n*

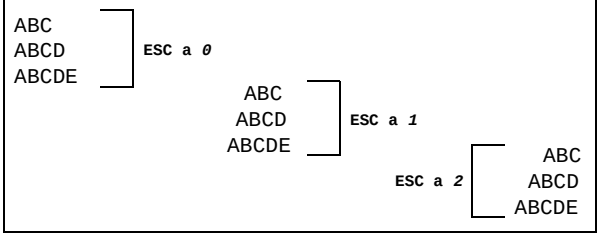
[Name]	Select justification			
[Format]	ASCII	ESC	a	*n*
	Hex	1B	61	*n*
	Decimal	27	97	*n*
[Range]	$0 \le n \le 2$			
	$48 \le n \le 50$			

ESC a *n* aligns all the data in one line to a specified position. Left justification is selected when ***n***=0 or 48, centering is selected when ***n***=1 or 49, and right justification is selected when ***n***=2 or 50. The default setting is left justification (***n***=0). This command is enabled only when processed at the beginning of a line.

Program Example

```
FOR n=0 TO 2
  PRINT #1, CHR$(&H1B);"a";CHR$(n);
  PRINT #1, "ABC"; CHR$(&HA);
  PRINT #1, "ABCD"; CHR$(&HA);
  PRINT #1, "ABCDE"; CHR$(&HA);
NEXT n
```

Print Sample



HT

[Name]	Horizontal tab		
[Format]	ASCII	HT	
	Hex	09	
	Decimal	9	

ESC D *n1* ... *nk NUL*

[Name]	Set horizontal tab positions			
[Format]	ASCII	ESC	D	*n1 ... nk NUL*
	Hex	1B	44	*n1 ... nk 00*
	Decimal	27	68	*n1 ... nk 0*
[Range]	$1 \le n \le 255$			
	$0 \le k \le 32$			

HT moves the print start position to the next horizontal tab. This command is ignored unless the next horizontal tab position has been set.

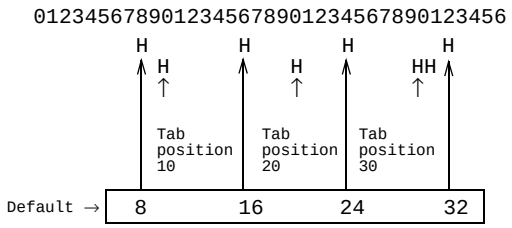
ESC D *n1* ... *nk NUL* sets a horizontal tab to ***n*** × character width to have been set columns from the left margin, with ***k*** indicating the total number of horizontal tab positions to be set. A maximum of 32 tab positions can be set. This command cancels any previous horizontal tab settings. The default tab positions are every eight characters for the font A (9x9).

Program Example

```
PRINT #1, "01234567890123456789012345678901234567890123456";
PRINT #1, CHR$(&HA);
GOSUB ht
PRINT #1, CHR$(&H1B);"D";CHR$(10);CHR$(20);
PRINT #1, CHR$(30);CHR$(0);
GOSUB ht
END

ht:
  FOR i=1 TO 4
    PRINT #1, CHR$(&H9); "H";
  NEXT i
  PRINT #1, CHR$(&HA);
  RETURN
```

Print Sample



GS L *nL nH*

[Name]	Set left margin				
[Format]	ASCII	GS	L	*nL*	*nH*
	Hex	1D	4C	*nL*	*nH*
	Decimal	29	76	*nL*	*nH*
[Range]	$0 \le nL \le 255$				
	$0 \le nH \le 255$				

GS W *nL nH*

[Name]	Set printing area width				
[Format]	ASCII	GS	W	*nL*	*nH*
	Hex	1D	57	*nL*	*nH*
	Decimal	29	87	*nL*	*nH*
[Range]	$0 \le nL \le 255$				
	$0 \le nH \le 255$				

GS L *nL nH* sets the left margin to (***nL*** + ***nH*** × 256) × horizontal motion unit from the beginning of a line. The default setting is ***nL***=0, ***nH***=0.

GS W *nL nH* sets the printing area width to (***nL*** + ***nH*** × 256) × horizontal motion unit. The default settings are ***nL***=32, ***nH***=3 (printable area).

The above commands are enabled only when processed at the beginning of a line.

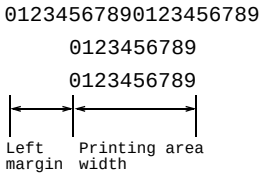
If the above commands set the printing area width to less than the width of a left margin or one character, the printing area width is extended to accommodate one character for the line.

The horizontal motion units set by **GS P** is used. The default setting of the horizontal motion unit is 1 / 150 inch.

Program Example

```
PRINT #1, CHR$(&H1D);"P";CHR$(150);CHR$(144);
PRINT #1, "01234567890123456789"; CHR$(&HA);
PRINT #1, CHR$(&H1D);"L";CHR$(60);CHR$(0);
PRINT #1, CHR$(&H1D);"W";CHR$(120);CHR$(0);
PRINT #1, "01234567890123456789"; CHR$(&HA);
```

Print Sample



Bit-Image Commands

The TM-U590 / U590P supports the following bit-image commands:

Command	Name
ESC ✻	Select bit-image mode
GS ✻	Define downloaded bit image
GS /	Print downloaded bit image

ESC ✻ *m nL nH d1 ... dk*

[Name] Select bit-image mode

[Format]

ASCII	ESC	✻	*m* *nL* *nH* *d1 ... dk*
Hex	1B	2A	*m* *nL* *nH* *d1 ... dk*
Decimal	27	42	*m* *nL* *nH* *d1 ... dk*

[Range]

$m = 0, 1$

$0 \le n_L \le 255$

$0 \le n_H \le 3$

$0 \le d \le 255$

$k = n_L + n_H \times 256$

ESC * *m* n_L n_H *d1* ... *dk* selects a bit-image mode using ***m*** for the number of dots specified by ($n_L + n_H \times 256$). ***d*** indicates the bit image data. Set a bit to 1 to print a dot, or set a bit to 0 to not print a dot. When 8-dot double-density bit image is selected, setting adjacent dots in horizontal is prohibited. This command is used to print a predefined picture or logo. The modes selectable by ***m*** are as follows:

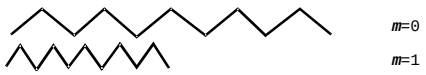
m	Mode	The Number of Dots in Vertical	Horizontal Direction	
			Set Adjacent Dots	Maximum Number of Dots
0	8-dot single-density	8	Permitted	400
1	8-dot double-density	8	Prohibited	800

Program Example

```
m=0:  GOSUB bitimage8  ← 8-dot single-density
m=1:  GOSUB bitimage8  ← 8-dot double-density
END

bitimage8:
  PRINT #1, CHR$(&H1B);"*";CHR$(m);CHR$(70);CHR$(0);
  FOR i=1 TO 5
    PRINT #1, CHR$(1);CHR$(2);CHR$(4);CHR$(8);
    PRINT #1, CHR$(16);CHR$(32);CHR$(64);CHR$(128);
    PRINT #1, CHR$(64);CHR$(32);CHR$(16);CHR$(8);
    PRINT #1, CHR$(4);CHR$(2);
  NEXT i
  PRINT #1, CHR$(&HA);
  RETURN
```

Print Sample



GS * *x y d1 ... d(x × y × 8)*

[Name] Define downloaded bit image

[Format]

ASCII	GS	*	*x y d1 ... d(x × y × 8)*	
Hex	1D	2A	*x y d1 ... d(x × y × 8)*	
Decimal	29	42	*x y d1 ... d(x × y × 8)*	

[Range]

$1 \le x \le 255$

$1 \le y \le 255$

$x \times y \le 404$

$0 \le d \le 255$

GS / *m*

[Name] Print downloaded bit image

[Format]				
	ASCII	GS	/	*m*
	Hex	1D	2F	*m*
	Decimal	29	47	*m*

[Range] *m*=0, 1, 48, 49

GS * *x y d1* ... *d*(*x* × *y* × *8*) defines a downloaded bit image using ***x*** × 8 dots in the horizontal direction and ***y*** × 8 dots in the vertical direction. ***d*** indicates the bit image data. Set a bit to 1 to print a dot, or set a bit to 0 to not print a dot. Once a downloaded bit image has been defined, it is available until another definition is made; **ESC &** or **ESC @** is executed; the printer is reset; or the power is turned off. When this command is executed, the user-defined characters are cleared. The default setting is no downloaded bit image defined.

GS / *m* prints a downloaded bit image using the mode specified by ***m***, as follows. This command is available only when there is no data in the print buffer. When normal mode is selected, setting adjacent dots in horizontal direction is prohibited.

m	Mode	Set Adjacent Dots in Horizontal	Maximum Number of Horizontal Dots
0, 48	Normal	Prohibited	800
1, 49	Double-width	Permitted	400

Program Example

```
x=18: y=5
PRINT #1, CHR$(&H1D);"*";CHR$(x);CHR$(y);
FOR i=1 TO x*y*8
  READ a$: d=VAL("&H"+a$)
  PRINT #1, CHR$(d);
NEXT i
```

Define downloaded bit image

```
PRINT #1, CHR$(&H1B);"U";CHR$(1); ← Select unidirectional printing
PRINT #1, CHR$(&H1D);"/";CHR$(0);CHR$(&HA); ← Normal
PRINT #1, CHR$(&H1D);"/";CHR$(1);CHR$(&HA); ← Double width

DATA AA,AA,AA,AA,AA,55,55,55,55,54,80,00,00,00,02
DATA 40,00,00,00,04,80,00,00,00,02,40,00,00,00,04
DATA 8A,AA,AA,AA,A2,45,55,55,55,44,8A,AA,AA,AA,A2
DATA 45,55,55,55,44,8A,AA,AA,AA,A2,45,00,50,01,44
DATA 8A,80,A8,02,A2,45,00,50,01,44,8A,80,A8,02,A2
DATA 45,00,50,01,44,8A,80,A8,02,A2,45,00,50,01,44
DATA 8A,80,A8,02,A2,45,00,00,01,44,8A,80,00,02,A2
DATA 40,00,00,00,04,80,00,00,00,02,40,00,00,00,04
DATA 80,AA,00,02,A2,41,55,00,01,44,82,AA,80,02,A2
DATA 45,55,40,01,44,8A,AA,A0,02,A2,45,45,50,01,44
DATA 8A,82,A8,02,A2,45,01,54,01,44,8A,80,AA,02,A2
DATA 45,00,55,01,44,8A,80,2A,82,A2,45,00,15,55,44
DATA 8A,80,0A,AA,A2,45,00,05,55,44,8A,80,02,AA,82
DATA 40,00,01,55,04,80,00,00,00,02,40,00,00,00,04
DATA 80,00,00,00,02,40,15,55,50,04,80,2A,AA,A8,02
DATA 40,55,55,54,04,80,AA,AA,AA,02,41,55,55,55,04
DATA 82,A8,00,2A,82,45,50,00,15,44,8A,A0,00,0A,A2
DATA 45,40,00,05,44,8A,80,00,02,A2,45,00,00,01,44
DATA 8A,80,00,02,A2,45,00,00,01,44,8A,80,00,02,A2
DATA 45,00,00,01,44,8A,80,00,02,A2,40,00,00,00,04
DATA 80,00,00,00,02,40,00,00,00,04,80,00,00,00,62
DATA 40,00,00,03,84,80,00,00,1C,02,40,00,00,60,04
```

Program Example (continued)

```
DATA 80,00,03,80,02,40,00,1C,00,04,80,00,60,00,02
DATA 40,03,80,00,04,80,0C,00,00,02,40,70,00,00,04
DATA 83,80,00,00,02,4C,00,00,00,04,80,00,00,00,02
DATA 40,00,00,00,04,80,00,00,00,02,4A,AA,AA,AA,A4
DATA 85,55,55,55,42,4A,AA,AA,AA,A4,85,55,55,55,42
DATA 4A,AA,AA,AA,A4,85,00,05,00,02,4A,08,0A,80,04
DATA 85,00,05,00,02,4A,80,0A,80,04,85,00,05,00,02
DATA 4A,80,0A,80,04,85,00,05,00,02,4A,80,0A,80,04
DATA 85,55,55,00,02,42,AA,AA,00,04,81,55,54,00,02
DATA 40,AA,A8,00,04,80,55,50,00,02,40,00,00,00,04
DATA 80,00,00,00,02,40,00,00,00,04,80,2A,AA,A8,02
DATA 40,55,55,54,04,80,AA,AA,AA,02,41,55,55,55,04
DATA 82,AA,AA,AA,82,45,40,00,05,44,8A,80,00,02,A2
DATA 45,00,00,01,44,8A,80,00,02,A2,45,00,00,01,44
DATA 8A,80,00,02,A2,45,00,00,01,44,8A,80,00,02,A2
DATA 45,00,00,01,44,8A,80,00,02,A2,45,40,00,05,44
DATA 82,AA,AA,AA,82,41,55,55,55,04,80,AA,AA,AA,02
DATA 40,55,55,54,04,80,2A,AA,A8,02,40,00,00,00,04
DATA 80,00,00,00,02,40,00,00,00,04,80,AA,00,02,A2
DATA 41,55,00,01,44,82,AA,80,02,A2,45,55,40,01,44
DATA 8A,AA,A0,02,A2,45,45,50,01,44,8A,82,A8,02,A2
DATA 45,01,54,01,44,8A,80,AA,02,A2,45,00,55,01,44
DATA 8A,80,2A,82,A2,45,00,15,55,44,8A,80,0A,AA,A2
DATA 45,00,05,55,44,8A,80,02,AA,82,40,00,01,55,04
DATA 80,00,00,00,02,40,00,00,00,04,80,00,00,00,02
DATA 40,00,00,00,04,AA,AA,AA,AA,AA,55,55,55,55,54
```

Print Sample

← GS / 0

← GS / 1

Status Commands

The TM-U590 / U590P supports the following status transmission commands. These commands can be used to determine the status of the printer, paper sensors, and peripheral devices connected to the printer. MICR status can be confirmed by the **DLE EOT BS** command (only with MICR reader).

Command	Name
GS a	Enable / disable Automatic Status Back (ASB)
GS r	Transmit status
DLE EOT	Real-time status transmission
DLE EOT BS	Real-time MICR status transmission

GS a *n*

[Name] Enable / disable Automatic Status Back (ASB)

[Format]				
	ASCII	GS	a	*n*
	Hex	1D	61	*n*
	Decimal	29	97	*n*

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

GS a *n* selects a status for ASB transmission. ASB is enabled if any status item is selected. The printer automatically transmits a 4-byte status message whenever the status changes. Multiple status items can be selected. When ***n***=0, ASB is disabled. The default (***n***=0 or 2) depends on the DIP switch 2-1 settings. If ASB is enabled when the printer is disabled by the **ESC =** command, the printer transmits a 4-byte status message whenever the status changes. The status items are selected using ***n*** as follows:

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Drawer kick-out connector pin 3 status disabled.
	On	01	1	Drawer kick-out connector pin 3 status enabled.
1	Off	00	0	On-line/off-line status disabled.
	On	02	2	On-line/off-line status enabled.
2	Off	00	0	Error status disabled.
	On	04	4	Error status enabled.
3-4	—	—	—	Undefined.
5	Off	00	0	Slip paper sensor and status disabled
	On	20	32	Slip paper sensor and status enabled.
6-7	—	—	—	Undefined.

Program Example

```
PRINT #1, CHR$(&H1D);"a";CHR$(4); ← Enable "Error" status
```

First byte (printer information)

Bit	Off/On	Hex	Decimal	Status for ASB
0	Off	00	0	Not used. Fixed to Off.
1	Off	00	0	Not used. Fixed to Off.
2	Off	00	0	Drawer kick-out connector pin 3 is LOW.
	On	04	4	Drawer kick-out connector pin 3 is HIGH.
3	Off	00	0	On-line.
	On	08	8	Off-line.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	Cover closed.
	On	20	32	Cover open.
6	Off	00	0	Paper is not being fed by the paper feed button.
	On	40	64	Paper is being fed by the paper feed button.
7	Off	00	0	Not used. Fixed to Off.

Second byte (printer information)

Bit	Off/On	Hex	Decimal	Status for ASB
0, 1	—	—	—	Undefined.
2	Off	00	0	No mechanical error
	On	04	4	Mechanical error occurred.
3	—	—	—	Undefined.
4	Off	00	0	Not used. Fixed to Off.
5	Off	00	0	No unrecoverable error.
	On	20	32	Unrecoverable error occurred.
6	—	—	—	Undefined.
7	Off	00	0	Not used. Fixed to Off.

Third byte (paper sensor information)

Bit	Off/On	Hex	Decimal	Status for ASB
0-3	—	—	—	Undefined.
4	Off	00	0	Not used. Fixed to Off.
5	Off	00	0	TOF sensor: paper present.
	On	20	32	TOF sensor: paper not present.
6	Off	00	0	BOF sensor: paper present.
	On	40	64	BOF sensor: paper not present.
7	Off	00	0	Not used. Fixed to Off.

Fourth byte (paper sensor information)

Bit	Off/On	Hex	Decimal	Status for ASB
0	Off	00	0	Slip paper selected.
	On	01	1	Slip paper not selected.
1	Off	00	0	Slip printing possible.
	On	02	2	Slip printing not possible.
2, 3	—	—	—	Undefined.
4	Off	00	0	Not used. Fixed to Off.
5, 6	—	—	—	Undefined.
7	Off	00	0	Not used. Fixed to Off.

GS r *n*

[Name] Transmit status

[Format]

ASCII	GS	r	*n*
Hex	1D	72	*n*
Decimal	29	114	*n*

[Range] $1 \le n \le 3$, $49 \le n \le 51$

GS r *n* transmits 1 byte of status data specified by ***n*** as follows: paper sensor status when ***n***=1 or 49, drawer kick-out connector status when ***n***=2 or 50 and slip status when ***n***=3 or ***n***=51.

Program Example

```
PRINT #1, CHR$(&H1D);"r";CHR$(1); ← Transmits paper sensor status
```

Paper sensor status (***n***=1, 49)

Bit	Off/On	Hex	Decimal	Status
0-3	—	—	—	Undefined.
4	Off	00	0	Not used. Fixed to Off.
5	Off	00	0	TOF sensor: paper present.
	On	20	32	TOF sensor: paper not present.
6	Off	00	0	BOF sensor: paper present.
	On	40	64	BOF sensor: paper not present.
7	Off	00	0	Not used. Fixed to Off.

Drawer kick-out connector status (***n***=2, 50)

Bit	Off/On	Hex	Decimal	Status
0	Off	00	0	Drawer kick-out connector pin 3 is LOW.
	On	01	1	Drawer kick-out connector pin 3 is HIGH.
1-3	—	—	—	Undefined.
4	Off	00	0	Not used. Fixed to Off.
5, 6	—	—	—	Undefined.
7	Off	00	0	Not used. Fixed to Off.

Slip status (***n***=3, 51)

This command transmits the remaining printing area (times the number of dots for the internal characters in vertical (9 dots)) by using the values from 00H to 06H. With the MICR reader model, the status is 00H when the slip paper is not selected.

The Number of Remaining Dots	Hex	Decimal
0 to 8	00	0
9 to 17	01	1
18 to 26	02	2
27 to 35	03	3
36 to 44	04	4
45 to 53	05	5
54 or more	06	6

DLE EOT *n*

[Name] Real-time status transmission

[Format]	ASCII	DLE	EOT	*n*
	Hex	10	04	*n*
	Decimal	16	4	*n*

[Range] $1 \le n \le 3$, $n=5$

DLE EOT *n* transmits the specified status in real time. This command is ignored during a process of transmitting the check paper reading result (only with the MICR reader). With a serial interface model, this command is executed even when the printer is off-line, the receive buffer is full, or an error occurs. With a parallel interface model, this command is not executed in the following status, because the printer is busy and unable to receive data from the host computer:

- ❏ Receive buffer is full when DIP switch 2-1 is set to ON.
- ❏ Printer is off-line, an error occurs, or receive buffer is full when DIP switch 2-1 is set to OFF.

n indicates the status function as follows:

n	**Function**
1	Transmit printer status
2	Transmit off-line status
3	Transmit error status
5	Transmit slip status

Program Example

```
PRINT #1, CHR$(&H10);CHR$(&H4);CHR$(2); ← Transmits off-line status
```

Printer status (***n***=1)

Bit	**Off/On**	**Hex**	**Decimal**	**Status**
0	Off	00	0	Not used. Fixed to Off.
1	On	02	2	Not used. Fixed to On.
2	Off	00	0	Drawer kick-out connector pin 3 is LOW.
	On	04	4	Drawer kick-out connector pin 3 is HIGH.
3	Off	00	0	On-line.
	On	08	8	Off-line.
4	On	10	16	Not used. Fixed to On.
5, 6	—	—	—	Undefined.
7	Off	00	0	Not used. Fixed to Off.

Off-line status (***n***=2)

Bit	**Off/On**	**Hex**	**Decimal**	**Status**
0	Off	00	0	Not used. Fixed to Off.
1	On	02	2	Not used. Fixed to On.
2	Off	00	0	Cover is closed.
	On	04	4	Cover is open.
3	Off	00	0	Paper is not being fed by the paper feed button.
	On	08	8	Paper is being fed by the paper feed button.
4	On	10	16	Not used. Fixed to On.
*5	Off	00	0	No paper-end stop.
	On	20	32	Printing stops due to paper-end.
6	Off	00	0	No error.
	On	40	64	Error occurred.
7	Off	00	0	Not used. Fixed to Off.

*The printer is not off-line when printing stops due to a paper-end.

Error status (***n***=3)

Bit	Off/On	Hex	Decimal	Status
0	Off	00	0	Not used. Fixed to Off.
1	On	02	2	Not used. Fixed to On.
2	Off	00	0	No mechanical error.
	On	04	4	Mechanical error occurred.
3	—	—	—	Undefined.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	No unrecoverable error.
	On	20	32	Unrecoverable error occurred.
6	—	—	—	Undefined.
7	Off	00	0	Not used. Fixed to Off.

Slip status (***n***=5)

Bit	Off/On	Hex	Decimal	Status
0	Off	00	0	Not used. Fixed to Off.
1	On	02	2	Not used. Fixed to On.
2	Off	00	0	Slip paper selected.
	On	04	4	Slip paper not selected.
3	Off	00	0	Does not wait for slip paper insertion.
	On	08	8	Waits for slip insertion.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	TOF sensor: paper present.
	On	20	32	TOF sensor: paper not present.
6	Off	00	0	BOF sensor: paper present.
	On	40	64	BOF sensor: paper not present.
7	Off	00	0	Not used. Fixed to Off.

DLE EOT BS *n*

[Name]	Real-time MICR status transmission				
[Format]	ASCII	DLE	EOT	BS	*n*
	Hex	10	04	08	*n*
	Decimal	16	4	8	*n*
[Range]	*n* = 1				

DLE EOT BS *n* transmits MICR status in real time when ***n***=1.

This command supports the TM-U590/U590P with the MICR option. This command is ignored during a process of transmitting the check paper reading result. With a serial interface model, this command is executed even when the printer is off-line, the receive buffer is full, or an error occurs. With a parallel interface model, this command is not executed in the following status, because the printer is busy and unable to receive data from the host computer:

- ❏ Receive buffer is full when DIP switch 2-1 is set to ON.
- ❏ Printer is off-line, an error occurs, or receive buffer is full when DIP switch 2-1 is set to OFF.

Program Example

```
PRINT #1, CHR$(&H10);CHR$(&H4);CHR$(&H8);CHR$(1); ← Transmits MICR status
```

The status information to be transmitted is shown in the table below.

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Not used. Fixed to Off.
1	On	02	2	Not used. Fixed to On.
2	Off	00	0	MICR function selected.
	On	04	4	MICR function not selected.
3	Off	00	0	Does not wait for check paper or cleaning sheet insertion.
	On	08	8	Waits for check paper or cleaning sheet insertion.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	TOF sensor: paper present.
	On	20	32	TOF sensor: paper not present.
6	Off	00	0	BOF sensor: paper present.
	On	40	64	BOF sensor: paper not present.
7	Off	00	0	Not used. Fixed to Off.

Mechanism Control Commands

The TM-U590/U590P supports the following mechanism control commands:

Command	Name
ESC <	Return home
ESC U	Turn unidirectional printing mode on/off
ESC F	Set/cancel cut sheet reverse eject
ESC q	Paper release

ESC <

[Name] Return home

[Format]			
	ASCII	ESC	<
	Hex	1B	3C
	Decimal	27	60

ESC < moves the print head to the home position.

Program Example

```
PRINT #1, CHR$(&H1B);"<";
```

ESC U *n*

[Name] Turn unidirectional printing mode on/off

[Format]				
	ASCII	ESC	U	*n*
	Hex	1B	55	*n*
	Decimal	27	85	*n*

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

ESC U *n* turns unidirectional printing mode on or off. When the LSB (least significant bit) of ***n*** is 1, unidirectional printing is turned on; when it is 0, unidirectional printing is turned off and bidirectional printing mode is turned on. Unidirectional printing can be turned on when printing double-height characters or downloaded bit image to ensure that the top and bottom of the characters are aligned. The default setting is ***n***=0.

Program Example

```
PRINT #1, CHR$(&H1B);"U";CHR$(1); ← Select unidirectional
PRINT #1, CHR$(&H1D);"!";CHR$(17); ← Set quadruple
PRINT #1, "AAAAA"; CHR$(&HA);
```

Print Sample

AAAAA

ESC F *n*

[Name]	Set / cancel cut sheet reverse eject			
[Format]	ASCII	ESC	F	*n*
	Hex	1B	46	*n*
	Decimal	27	70	*n*
[Range]	$0 \leq n \leq 255$			

ESC F *n* sets or cancels the slip paper reverse eject. When the LSB (least significant bit) of ***n*** is 1, the command sets the slip paper reverse eject. When it is 0, the command cancels the slip paper reverse eject. After canceling the slip paper reverse eject, the forward eject is set automatically. The default is ***n***=1.

Program Example

```
PRINT #1, CHR$(&H1B);"F";CHR$(0); ← cancel reverse eject
```

ESC q

[Name]	Paper release		
[Format]	ASCII	ESC	q
	Hex	1B	71
	Decimal	27	113

ESC q releases the paper. The printer waits for the paper to be removed after executing a release.

Program Example

```
PRINT #1, CHR$(&H1B);"q";
```

MICR Commands

The TM-U590/U590P (with the MICR reader) supports the following MICR function commands. MICR status can be confirmed by the **DLE EOT BS** command. Refer to the Status Commands section for details.

Command	Name
FS c	MICR mechanism cleaning
FS a 0	Read check paper
FS b	Request retransmission of check paper reading result
FS a 1	Load check paper to print starting position
FS a 2	Eject check paper

FS c

[Name]	MICR mechanism cleaning		
[Format]	ASCII	FS	c
	Hex	1C	63
	Decimal	28	99

FS c cleans the MICR mechanism. When this command is executed, the printer enters cleaning sheet wait status. Insert the cleaning sheet into the check paper entrance. After cleaning, the printer ejects the cleaning sheet. This command is enabled only when processed at the beginning of a line.

Program Example

```
PRINT #1, CHR$(&H1C);"c";
```

FS a 0 *n*

[Name]	Read check paper				
[Format]	ASCII	FS	a	0	*n*
	Hex	1C	61	30	*n*
	Decimal	28	97	48	*n*
[Range]	$0 \le n \le 255$				

FS a 0 *n* selects the MICR function and reads the check paper. When changing readable waveforms to character data, ***n***=0 specifies a readable font as E13B and ***n***=1 specifies a readable font as CMC7. After ending MICR reading normally, the printer transmits “header + reading status + identified

character strings + NULL" to the host computer. In other cases, the printer transmits "header + reading status + NULL" to the host computer. This command is enabled only when processed at the beginning of a line.

Program Example

```
PRINT #1, CHR$(&H1C);"a0";CHR$(0); ← Specifies readable font as E13B
```

Header : 5FH (decimal 95)
NULL : 00H (decimal 0)

Reading status:

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Readable fonts. See the table below.
	On	01	1	
1	Off	00	0	
	On	02	2	
2, 3	—	—	—	Undefined.
4	On	10	16	Rereading not possible. Fixed to On.
5	Off	00	0	Reading normal.
	On	20	32	Reading not normal.
6	On	40	64	Not used. Fixed to On.
7	Off	00	0	Not used. Fixed to Off.

Readable fonts:

Bit 1	Bit 0	Font
Off	Off	E13B
Off	On	CMC7
On	Off	Undefined
On	On	Undefined

FS b

[Name] Request retransmission of check paper reading result

[Format]

ASCII	FS	b
Hex	1C	62
Decimal	28	98

FS b retransmits the previous check paper reading results. The transmitted information is the same as that previously sent by **FS a 0**. If **FS a 0** is not executed before **FS b**, the printer transmits the reading status as “not normal”.

Program Example

```
PRINT #1, CHR$(&H1C);"b";
```

FS a 1

[Name]	Load check paper to print starting position			
[Format]	ASCII	FS	a	1
	Hex	1C	61	31
	Decimal	28	97	49

FS a 1 loads check paper to the print starting position. After loading the check paper, the printer cancels the MICR function and automatically selects slip paper as the print sheet. This command is ignored unless the MICR function is selected.

Program Example

```
PRINT #1, CHR$(&H1C);"a1";
PRINT #1, "AAAAA"; CHR$(&HA);
```

FS a 2

[Name]	Eject check paper			
[Format]	ASCII	FS	a	2
	Hex	1C	61	32
	Decimal	28	97	50

FS a 2 ejects the check paper. After ejecting the check, the printer cancels the MICR function and automatically selects the slip paper as the print sheet. This command is ignored unless the MICR function is selected.

Program Example

```
PRINT #1, CHR$(&H1C);"a2";
```

Miscellaneous Function Commands

The TM-U590/U590P supports the following miscellaneous function commands:

Command	Name
GS P	Set horizontal and vertical motion units
ESC @	Initialize printer
GS I	Transmit printer ID
ESC p	Generate pulse
ESC =	Select peripheral device
DLE ENQ	Real-time request to printer

GS P *x y*

[Name]	Set horizontal and vertical motion units				
[Format]	ASCII	GS	P	*x*	*y*
	Hex	1D	50	*x*	*y*
	Decimal	29	80	*x*	*y*
[Range]	$0 \le x \le 255$				
	$0 \le y \le 255$				

GS P *x y* sets the horizontal (perpendicular to the paper feed direction) and vertical (the paper feed direction) motion units to 1/***x*** and 1/***y*** inches, respectively. The horizontal and vertical motion units indicate the minimum pitch used for calculating the values of related commands (shown below). The default values are ***x***=150 and ***y***=144. These value equal a half dot pitch in horizontal and 1/2 dot pitch in vertical.

When ***x*** and ***y*** are set to 0, the default setting of each value is used.

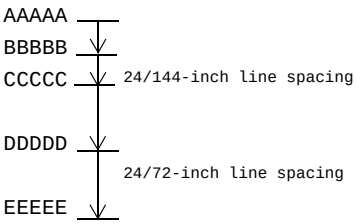
Commands used with the horizontal motion unit (1/***x***) : **ESC SP**, **ESC $**, **ESC **, **GS L**, and **GS W**.

Commands used with the vertical motion unit (1/***y***) : **ESC 3**, **ESC J**, and **ESC K**.

Program Example

```
PRINT #1, CHR$(&H1D);"P";CHR$(150);CHR$(144);
PRINT #1, CHR$(&H1B);"3";CHR$(24);  ← Set line spacing
PRINT #1, "AAAAA"; CHR$(&HA);
PRINT #1, "BBBBB"; CHR$(&HA);
PRINT #1, CHR$(&H1D);"P";CHR$(150);CHR$(72);
PRINT #1, CHR$(&H1B);"3";CHR$(24);  ← Set line spacing
PRINT #1, "CCCCC"; CHR$(&HA);
PRINT #1, "DDDDD"; CHR$(&HA);
PRINT #1, "EEEEE"; CHR$(&HA);
```

Print Sample



ESC @

[Name] Initialize printer

[Format]			
	ASCII	ESC	@
	Hex	1B	40
	Decimal	27	64

ESC @ initializes the printer. All settings, including character font and line spacing settings, are canceled.

Program Example

```
PRINT #1, CHR$(&H1B);"U";CHR$(1);
PRINT #1, CHR$(&H1D);"!";CHR$(17);
PRINT #1, CHR$(&H1B);"E";CHR$(1);
PRINT #1, "AAAAA"; CHR$(&HA);
PRINT #1, CHR$(&H1B);"@"; ← Initialize printer
PRINT #1, "BBBBB"; CHR$(&HA);
```

Print Sample

AAAAA

BBBBB ← All settings are canceled after **ESC @** is executed

GS I *n*

[Name] Transmit printer ID

[Format]	ASCII	GS	I	*n*
	Hex	1D	49	*n*
	Decimal	29	73	*n*
[Range]	$1 \le n \le 3$			
	$49 \le n \le 51$			

GS I *n* transmits the printer ID specified by ***n*** as follows. Each printer ID consists of 1 byte of data.

n	**Printer ID**	**Specification**	**ID**
1, 49	Printer model ID	TM-U590/U590P	Hexadecimal : 21H Decimal : 33
2, 50	Type ID	See table below.	
3, 51	ROM version ID	Version x.xx ESC/POS	Refer to current ROM version

Type ID (***n***=2 or 50)

Bit	**Off/On**	**Hex**	**Decimal**	**Function**
0	Off	00	0	Two-byte character code not supported.
1	Off	00	0	Not auto-cutter equipped.
*2	Off	00	0	Customer display not connected (Dip switch 2-2 is set to Off).
	On	04	4	Customer display connected (Dip switch 2-2 is set to On).
3	Off	00	0	Without MICR reader model.
	On	08	8	With MICR reader model.
4	Off	00	0	Not used. Fixed to Off.
5, 6	—	—	—	Undefined.
7	Off	00	0	Not used. Fixed to Off.

* With a parallel interface model, bit 2 is fixed to Off.

Program Example

```
PRINT #1, CHR$(&H1D);"I";CHR$(1);   ← Transmits printer ID
```

ESC p *m t1 t2*

[Name]	Generate pulse					
[Format]	ASCII	ESC	p	*m*	*t1*	*t2*
	Hex	1B	70	*m*	*t1*	*t2*
	Decimal	27	112	*m*	*t1*	*t2*
[Range]	*m* = 0, 1, 48, 49					
	0 ≤ *t1* ≤ 255					
	0 ≤ *t2* ≤ 255					

ESC p *m t1 t2* sends a pulse (on time= ***t1*** × 2 msec / off time= ***t2*** × 2 msec) to the specified connector pin. When ***m***=0 or 48, the pulse is sent to drawer kick-out connector pin 2; when ***m***=1 or 49, the pulse is sent to drawer kick-out connector pin 5.

Program Example

```
PRINT #1, CHR$(&H1B);"p";CHR$(0);CHR$(25);CHR$(250);
```

ESC = *n*

[Name]	Select peripheral device			
[Format]	ASCII	ESC	=	*n*
	Hex	1B	3D	*n*
	Decimal	27	61	*n*
[Range]	1 ≤ *n* ≤ 3			

ESC = *n* selects the device to which the host computer sends data, based on the value of ***n*** as follows:

n	**Peripheral Device Status**
1	Only printer selected. (customer display is disabled)
2	Only customer display selected. (printer is disabled)
3	Both printer and customer display selected.

When the printer is disabled (***n***=2), it ignores all received data with the exception of the **DLE ENQ *1*** and **DLE ENQ *2*** commands. If ASB is enabled when the printer is disabled by the **ESC =** command, the printer transmits a 4-byte status message whenever the status changes.

With a serial interface model, the default setting is ***n***=1 when DIP switch 2-2 is off and ***n***=2 when DIP switch 2-2 is on.

With a parallel interface model, the default setting is ***n***=1.

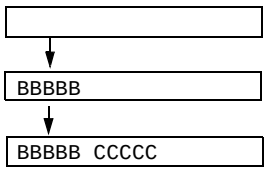
Program Example

```
PRINT #1, CHR$(&H1B);"=";CHR$(1); ← Printer enabled
PRINT #1, "AAAAA";
PRINT #1, CHR$(&H1B);"=";CHR$(2); ← Only customer display enabled
PRINT #1, "BBBBB";
PRINT #1, CHR$(&H1B);"=";CHR$(3); ← Both printer and customer display enabled
PRINT #1, " CCCCC"; CHR$(&HA);
```

Print Sample

```
AAAAA CCCCC
```

Customer Display Sample



DLE ENQ *n*

[Name] Real-time request to printer

[Format]				
	ASCII	DLE	ENQ	*n*
	Hex	10	05	*n*
	Decimal	16	5	*n*

[Range] $1 \leq n \leq 3$

DLE ENQ *n* responds to a request in real time from the host computer, specified by ***n*** as shown below. ***n*** can be set to 1 or 2 only when a recoverable error occurs. This command is also executed to recover from a recoverable error when the printer is disabled by **ESC =**.

For the TM-U590 / U590P with the MICR reader, ***n*** can be set to 3 only when the printer is in the check paper or cleaning sheet insertion waiting status. The check paper or cleaning sheet insertion waiting status can be confirmed by the **DLE EOT BS** command. During transmitting check paper reading result, this command is ignored.

When a recoverable error occurs, after removing a cause of an error, the printer can recover from an error without turning off the power.

With a serial interface model, this command is executed even when the printer is off-line, the receive buffer is full, or an error occurs.

With a parallel interface model, this command is not executed in the following status because the printer is busy and unable to receive data from the host computer:

- ❏ Receive buffer is full when DIP switch 2-1 is set to On.
- ❏ Printer is off-line, an error occurs, or receive buffer is full when the DIP switch 2-1 is set to Off.

n	**Request**
1	Restarts printing from the beginning of the line where an error occurred, after recovering from the error.
2	Recovers from an error after clearing the receive and print buffers.
3	Recovers from an error after clearing the receive and print buffers, cancels the check paper or cleaning sheet waiting status.

Program Example

```
PRINT #1, CHR$(&H10);CHR$(&H5);CHR$(2);
```

Character Code Tables

SP in a table represents space. Refer to page 1-50 for information on how to read these tables.

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

HEX	BIN	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
		0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	NUL 00	DLE 16	SP 32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	▒ 176	└ 192	┴ 208	α 224	≡ 240
1	0001	01	XON 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▒ 177	┴ 193	┬ 209	ß 225	± 241
2	0010	02	18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	▓ 178	┬ 194	┬ 210	Γ 226	≥ 242
3	0011	03	XOFF 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	└ 211	π 227	≤ 243
4	0100	EOT 04	20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	┌ 212	Σ 228	⌠ 244
5	0101	ENQ 05	21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	╡ 181	┼ 197	┐ 213	σ 229	⌡ 245
6	0110	06	22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	ª 166	╢ 182	├ 198	┌ 214	µ 230	÷ 246
7	0111	07	23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	1000	BS 08	24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	1001	HT 09	25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	θ 233	• 249
A	1010	LF 10	26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	1011	11	ESC 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	¢ 155	½ 171	╗ 187	╦ 203	▒ 219	δ 235	√ 251
C	1100	FF 12	FS 28	, 44	< 60	L 76	\ 92	l 108	¦ 124	î 140	£ 156	¼ 172	╝ 188	╠ 204	▬ 220	∞ 236	n 252
D	1101	CR 13	GS 29	− 45	= 61	M 77	] 93	m 109	} 125	ì 141	¥ 157	¡ 173	╜ 189	═ 205	▌ 221	ø 237	² 253
E	1110	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	₧ 158	« 174	╛ 190	╬ 206	▐ 222	∈ 238	■ 254
F	1111	15	31	/ 47	? 63	O 79	_ 95	o 111	SP 127	Å 143	ƒ 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	SP 255

Page 1 (Katakana)

HEX	BIN	8	9	A	B	C	D	E	F
		1000	1001	1010	1011	1100	1101	1110	1111
0	0000	ー 128	丄 144	SP 160	ー 176	タ 192	ミ 208	二 224	× 240
1	0001	▬ 129	丅 145	。 161	ア 177	チ 193	ム 209	卞 225	円 241
2	0010	▬ 130	丬 146	「 162	イ 178	ツ 194	メ 210	丰 226	年 242
3	0011	▬ 131	丨 147	」 163	ウ 179	テ 195	モ 211	丱 227	月 243
4	0100	■ 132	一 148	、 164	エ 180	ト 196	ヤ 212	◢ 228	日 244
5	0101	■ 133	一 149	・ 165	オ 181	ナ 197	ユ 213	◣ 229	時 245
6	0110	■ 134	丨 150	ヲ 166	カ 182	ニ 198	ヨ 214	◤ 230	分 246
7	0111	■ 135	丨 151	ァ 167	キ 183	ヌ 199	ラ 215	◥ 231	秒 247
8	1000	丨 136	厂 152	ィ 168	ク 184	ネ 200	リ 216	♠ 232	〒 248
9	1001	▌ 137	冂 153	ゥ 169	ケ 185	ノ 201	ル 217	♥ 233	市 249
A	1010	▌ 138	乚 154	ェ 170	コ 186	ハ 202	レ 218	✦ 234	区 250
B	1011	▌ 139	亅 155	ォ 171	サ 187	ヒ 203	ロ 219	♣ 235	町 251
C	1100	▌ 140	亻 156	ャ 172	シ 188	フ 204	ワ 220	● 236	村 252
D	1101	▌ 141	冫 157	ュ 173	ス 189	ヘ 205	ン 221	○ 237	人 253
E	1110	▌ 142	乀 158	ョ 174	セ 190	ホ 206	゛ 222	／ 238	▒ 254
F	1111	＋ 143	丿 159	ッ 175	ソ 191	マ 207	° 223	＼ 239	SP 255

Page 2 (PC850: Multilingual)

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	Ç 128	É 144	á 160	▒ 176	└ 192	ð 208	Ó 224	— 240
1	0001	ü 129	æ 145	í 161	▒ 177	┴ 193	Ð 209	ß 225	± 241
2	0010	é 130	Æ 146	ó 162	▒ 178	┬ 194	Ê 210	Ô 226	‗ 242
3	0011	â 131	ô 147	ú 163	│ 179	├ 195	Ë 211	Ò 227	¾ 243
4	0100	ä 132	ö 148	ñ 164	┤ 180	─ 196	È 212	õ 228	¶ 244
5	0101	à 133	ò 149	Ñ 165	Á 181	┼ 197	ı 213	Õ 229	§ 245
6	0110	å 134	û 150	ª 166	Â 182	ã 198	Í 214	µ 230	÷ 246
7	0111	ç 135	ù 151	º 167	À 183	Ã 199	Î 215	þ 231	¸ 247
8	1000	ê 136	ÿ 152	¿ 168	© 184	╚ 200	Ï 216	Þ 232	° 248
9	1001	ë 137	Ö 153	® 169	╣ 185	╔ 201	┘ 217	Ú 233	¨ 249
A	1010	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Û 234	· 250
B	1011	ï 139	ø 155	½ 171	╗ 187	╦ 203	▉ 219	Ù 235	¹ 251
C	1100	î 140	£ 156	¼ 172	╝ 188	╠ 204	▬ 220	ý 236	³ 252
D	1101	ì 141	Ø 157	¡ 173	¢ 189	═ 205	¦ 221	Ý 237	² 253
E	1110	Ä 142	× 158	« 174	¥ 190	╬ 206	Ì 222	¯ 238	■ 254
F	1111	Å 143	ƒ 159	» 175	┐ 191	¤ 207	▀ 223	´ 239	SP 255

Page 3 (PC860: Portuguese)

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	Ç 128	É 144	á 160	▒ 176	└ 192	╨ 208	α 224	≡ 240
1	0001	ü 129	À 145	í 161	▒ 177	┴ 193	╤ 209	ß 225	± 241
2	0010	é 130	È 146	ó 162	▒ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	0011	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	0100	ã 132	õ 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	0101	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	0110	Á 134	Ú 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	0111	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	1000	ê 136	Ì 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	1001	Ê 137	Õ 153	Ò 169	╣ 185	╔ 201	┘ 217	θ 233	• 249
A	1010	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	1011	Í 139	¢ 155	½ 171	╗ 187	╦ 203	▉ 219	δ 235	√ 251
C	1100	Ô 140	£ 156	¼ 172	╝ 188	╠ 204	▬ 220	∞ 236	n 252
D	1101	ì 141	Ù 157	¡ 173	╜ 189	═ 205	▌ 221	ø 237	² 253
E	1110	Ã 142	₧ 158	« 174	╛ 190	╬ 206	▐ 222	∈ 238	■ 254
F	1111	Ã 143	Ó 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	SP 255

Page 4 (PC863: Canadian-French)

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	Ç 128	É 144	¦ 160	▒ 176	└ 192	╨ 208	α 224	≡ 240
1	0001	ü 129	È 145	´ 161	▒ 177	┴ 193	╤ 209	ß 225	± 241
2	0010	é 130	Ê 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	0011	â 131	ô 147	ú 163	| 179	├ 195	╙ 211	π 227	≤ 243
4	0100	Â 132	Ë 148	¨ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	0101	à 133	Ï 149	¸ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	0110	¶ 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	0111	Ç 135	ù 151	¯ 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	1000	ê 136	¤ 152	Î 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	1001	ë 137	Ô 153	⌐ 169	╣ 185	╔ 201	┘ 217	θ 233	• 249
A	1010	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	1011	ï 139	¢ 155	½ 171	╗ 187	╦ 203	▉ 219	δ 235	√ 251
C	1100	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	n 252
D	1101	‗ 141	Ù 157	¾ 173	╜ 189	═ 205	▌ 221	ø 237	² 253
E	1110	À 142	Û 158	« 174	╛ 190	╬ 206	▐ 222	∈ 238	■ 254
F	1111	§ 143	ƒ 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	SP 255

Page 5 (PC865: Nordic)

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	Ç 128	É 144	á 160	▒ 176	└ 192	╨ 208	α 224	≡ 240
1	0001	ü 129	æ 145	í 161	▒ 177	┴ 193	╤ 209	ß 225	± 241
2	0010	é 130	Æ 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	0011	â 131	ô 147	ú 163	| 179	├ 195	╙ 211	π 227	≤ 243
4	0100	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	0101	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	0110	å 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	0111	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	1000	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	1001	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	θ 233	• 249
A	1010	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	1011	ï 139	ø 155	½ 171	╗ 187	╦ 203	▉ 219	δ 235	√ 251
C	1100	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	n 252
D	1101	ì 141	Ø 157	¡ 173	╜ 189	═ 205	▌ 221	ø 237	² 253
E	1110	Ä 142	₧ 158	« 174	╛ 190	╬ 206	▐ 222	∈ 238	■ 254
F	1111	Å 143	ƒ 159	¤ 175	┐ 191	╧ 207	▀ 223	∩ 239	SP 255

Using the Character Code Tables

The example below uses Page 0 (PC437) (see page 1-47) to illustrate the use of the character code tables.

You can find the character "A" in Page 0 as follows:

The decimal value for the character "A" is 65.

Follow its column straight up to find the digits.

Hexadecimal 4

Binary 0100

These numbers are the most significant bits of the ASCII code.

Follow its row to the left to find the digits.

Hexadecimal 1

Binary 0001

These numbers are the least significant bits of the ASCII code.

The combination of the numbers above is the ASCII code for character "A".

Decimal 65

Hexadecimal 41

Binary 01000001

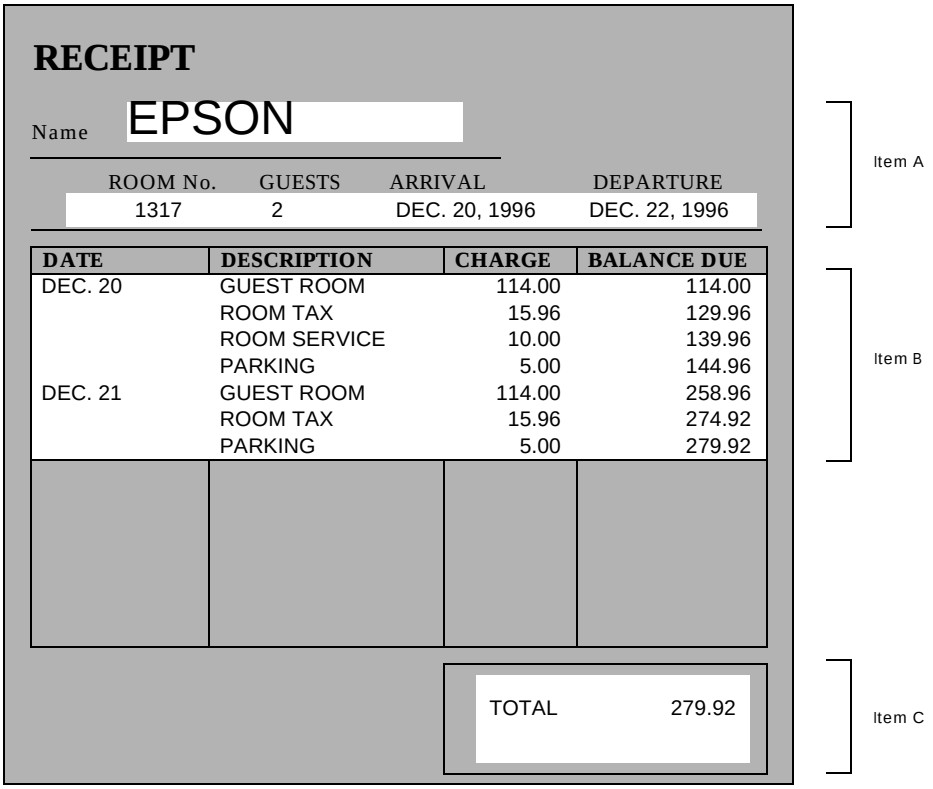
Chapter 2
Application

This chapter presents an example illustrating ESC / POS command functions and printing results. The example shows a receipt issuing procedure and its programs for a pre-printed form.

Receipt Issuing Procedure

Procedure	Commands Used	Description
1. Set the default	**ESC @**, **ESC c 4**, **ESC D**	Enables the TOF sensor and BOF sensor that stop printing when the paper runs out. Sets horizontal tab positions for printing items B and C.
2. Print item A	**GS !**, **ESC U**, **ESC $**, **ESC J**, **LF**, **ESC d**	Sets a print position and prints item A with ESC $. Sets unidirectional printing for printing double-height characters.
3. Print item B	**ESC !**, **HT**, **LF**, **ESC d**	Selects the character font B (7x9) for printing items B and C. Aligns print position with HT and prints item B.
4. Print item C	**HT, LF**	Sets print position and prints item C.
5 Eject cut sheet	**FF**	Ejects cut sheet.

Print Sample



(The shaded area indicates a pre-printed form.)

Program Example

```
PRINT #1, CHR$(&H1B);"@"; ← Initialize the device
PRINT #1, CHR$(&H1B);"c4";CHR$(48); ← Enable a sensor to stop printing
PRINT #1, CHR$(&H1B);"D";CHR$(10);CHR$(40);CHR$(55);CHR$(0); ← Set horizontal tab position

PRINT #1, CHR$(&H1D);"!";CHR$(17); ← Select character size (double-height x double-width)
PRINT #1, CHR$(&H1B);"U";CHR$(1); ← Select unidirectional printing
PRINT #1, CHR$(&H1B);"$";CHR$(60);CHR$(0) ←Set print position
PRINT #1, "EPSON";CHR$(&H1B);"J";CHR$(68); ← Print and paper feed
PRINT #1, CHR$(&H1B);"U";CHR$(0); ← Cancel unidirectional printing
PRINT #1, CHR$(&H1D);"!";CHR$(0); ← Select character size (normal)
PRINT #1, CHR$(&H1B);"$";CHR$(60);CHR$(0); ← Set print position
PRINT #1, "1317       2          DEC.20,1996        DEC.22,1996";
PRINT #1, CHR$(&H1B);"d";CHR$(3); ← Print and 3-line paper feed
PRINT #1, CHR$(&H1B);"!";CHR$(1); ← Select character font B (7x9)
PRINT #1, "DEC. 20";CHR$(&H9);"GUEST ROOM";CHR$(&H9);
PRINT #1, "114.00";CHR$(&H9);"114.00";CHR$(&HA);
PRINT #1, CHR$(&H9);"ROOM TAX";CHR$(&H9);
PRINT #1, " 15.96";CHR$(&H9);"129.96";CHR$(&HA);
PRINT #1, CHR$(&H9);"ROOM SERVICE";CHR$(&H9);
PRINT #1, " 10.00";CHR$(&H9);"139.96";CHR$(&HA);
PRINT #1, CHR$(&H9);"PARKING";CHR$(&H9);
PRINT #1, "  5.00";CHR$(&H9);"144.96";CHR$(&HA);
PRINT #1, "DEC. 21";CHR$(&H9);"GUEST ROOM";CHR$(&H9);
PRINT #1, "114.00";CHR$(&H9);"258.96";CHR$(&HA);
PRINT #1, CHR$(&H9);"ROOM TAX";CHR$(&H9);
PRINT #1, " 15.96";CHR$(&H9);"274.92";CHR$(&HA);
PRINT #1, CHR$(&H9);"PARKING";CHR$(&H9);
PRINT #1, "  5.00";CHR$(&H9);"279.92";
PRINT #1, CHR$(&H1B);"d";CHR$(8); ← Print and 8-line paper feed

PRINT #1, CHR$(&H9);CHR$(&H9);"TOTAL";CHR$(&H9);"279.92";CHR$(&HA);
PRINT #1, CHR$(&HC); ← Eject the cut sheet
```

Print Item A

Print Item B

Print Item C

Chapter 3
Command Reference

Command Classification

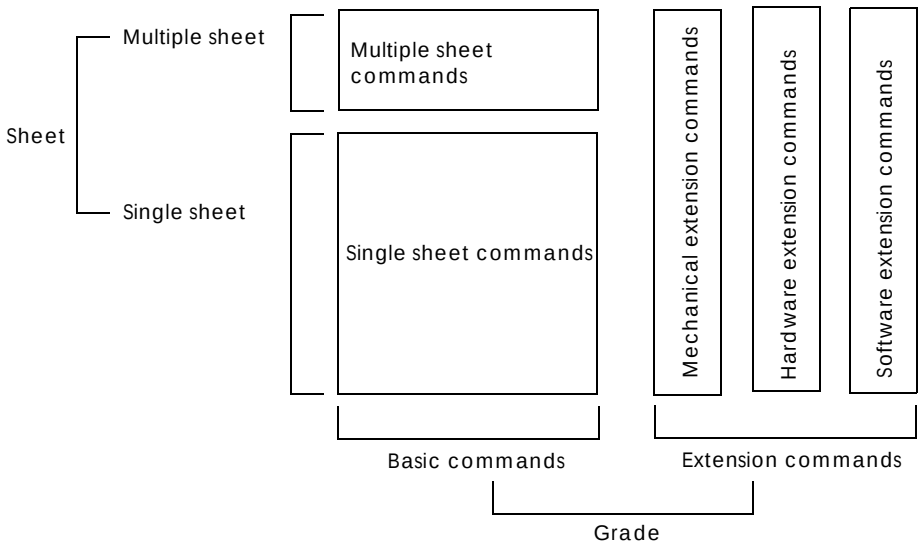
ESC / POS printer commands in this chapter are classified by function and by *sheet* and *grade*. The sheet and grade classification is called *matrix classification*.

The *sheet* classification is divided into *single sheet commands* and *multiple sheet commands*. The *grade* classification is separated into *basic commands* and *extension commands*.

Basic commands are defined as fundamental printer controls, including print commands and character type selection commands. *Extension commands* are defined as control codes for functions specific to individual printers. These commands are further divided into *mechanical extension commands* that relate to additional mechanical functions such as stamp and auto-cutter units, *hardware extension commands* that relate to additional hardware functions such as panel button control, and *software extension commands* that relate to additional software functions such as user-defined and Bar code control.

The commands can also be classified by function, which is how they are presented in Chapter 1 and the Function Type table in this chapter. The function types, such as Print Commands and Line Spacing Commands, are briefly explained in the corresponding sections of Chapter 1.

The illustration below shows the ESC / POS command overview diagram for printers.



Function Type

Function Type	Command	Name	Matrix Category	Supported Command
Print commands	**LF**	Print and line feed	Basic single	●
	FF	1. Print and eject cut sheet (in standard mode)	Mechanical extension	●
		2. Print and return to standard mode (in page mode)	Mechanical extension	
		3. Print and feed label to print starting position (on label)	Mechanical extension	
	CR	Print and carriage return	Mechanical extension	●
	ESC FF	Print data in page mode	Software extension	
	ESC J	Print and feed paper	Mechanical extension	●
	ESC K	Print and reverse feed	Mechanical extension	●
	ESC d	Print and feed ***n*** lines	Basic single	●
	ESC e	Print and reverse feed ***n*** lines	Mechanical extension	●
	GS FF	Print and eject label	Hardware extension	
Line spacing commands	**ESC 2**	Select default line spacing	Mechanical extension	●
	ESC 3	Set line spacing	Mechanical extension	●
	ESC C	Set cut sheet eject length	Mechanical extension	●
Character commands	**CAN**	Cancel print data in page mode	Software extension	
	ESC SP	Set right-side character spacing	Basic single	●
	ESC !	Select print mode(s)	Basic single	●
	ESC %	Select/cancel user-defined character set	Software extension	●
	ESC &	Define user-defined characters	Software extension	●
	ESC –	Turn underline mode on/off	Software extension	●
	ESC ?	Cancel user-defined characters	Software extension	●
	ESC E	Turn emphasized mode on/off	Software extension	●
	ESC G	Turn double-strike mode on/off	Software extension	●
	ESC R	Select an international character set	Basic single	●
	ESC V	Turn 90° clockwise rotation mode on/off	Software extension	
	ESC r	Select print color	Mechanical extension	
	ESC t	Select character code table	Basic single	●

The TM-U590/U590P supports the commands marked with a ● in the "Supported Command" column.
The TM-U590/U590P with the MICR reader also supports the commands marked with a O in the "Supported Command" column.

Function Type	Command	Name	Matrix Category	Supported Command
Character commands (continued)	**ESC z**	Turn parallel printing mode on/off for receipt and journal paper	Mechanical extension	
	ESC {	Turn upside-down printing mode on/off	Basic single	●
	GS !	Select character size	Software extension	●
	GS B	Turn white/black reverse printing mode on/off	Software extension	
	GS b	Turn smoothing mode on/off	Software extension	
Paper sensor commands	**ESC c 3**	Select paper sensor(s) to output paper-end signals	Mechanical extension	●
	ESC c 4	Select paper sensor(s) to stop printing	Mechanical extension	●
Panel button commands	**ESC c 5**	Enable/disable panel buttons	Hardware extension	●
	ESC c 6	Enable/disable on-line button	Hardware extension	
Printing paper commands	**ESC c 0**	Select paper type(s) for printing	Basic multiple	
	ESC c 1	Select paper type(s) for command settings	Mechanical extension	
	ESC f	Set cut sheet wait time	Mechanical extension	●
Print position commands	**HT**	Horizontal tab	Software extension	●
	RS	Journal tab	Mechanical extension	
	ESC $	Set absolute print position	Software extension	●
	ESC D	Set horizontal tab positions	Software extension	●
	ESC T	Select print direction in page mode	Software extension	
	ESC W	Set printing area in page mode	Software extension	
	**ESC **	Set relative print position	Software extension	●
	ESC a	Select justification	Software extension	●
	GS $	Set absolute vertical print position in page mode	Software extension	
	GS L	Set left margin	Software extension	●
	GS W	Set printing area width	Software extension	●
	**GS **	Set relative vertical print position in page mode	Software extension	

The TM-U590/U590P supports the commands marked with a ● in the "Supported Command" column.
The TM-U590/U590P with the MICR reader also supports the commands marked with a O in the "Supported Command" column.

Function Type	Command	Name	Matrix Category	Supported Command
Mechanism control commands	**ESC <**	Return home	Mechanical extension	●
	ESC F	Set/cancel cut sheet reverse eject	Mechanical extension	●
	ESC U	Turn unidirectional printing mode on/off	Mechanical extension	●
	ESC i	Partial cut (one point left uncut)	Mechanical extension	
	ESC m	Partial cut (three points left uncut)	Mechanical extension	
	ESC o	Stamp	Mechanical extension	
	ESC q	Paper release	Mechanical extension	●
	GS V	Select cut mode and cut paper	Mechanical extension	
Status commands	**DLE EOT**	Real-time status transmission	Hardware extension	●
	DLE EOT BS	Real-time MICR status transmission	Hardware extension	O
	ESC u	Transmit peripheral device status	Hardware extension	
	ESC v	Transmit paper sensor status	Hardware extension	
	GS ENQ	Transmit real-time printer status	Hardware extension	
	GS a	Enable/disable Automatic Status Back (ASB)	Hardware extension	●
	GS r	Transmit status	Hardware extension	●
Bit-image commands	**ESC ✲**	Select bit-image mode	Basic single	●
	GS ✲	Define downloaded bit image	Software extension	●
	GS /	Print downloaded bit image	Software extension	●
Bar code commands	**GS H**	Select printing position of HRI characters	Software extension	
	GS f	Select font for HRI characters	Software extension	
	GS h	Set bar code height	Software extension	
	GS k	Print bar code	Software extension	
	GS w	Set bar code width	Software extension	
Macro function commands	**GS :**	Start/end macro definition	Software extension	
	GS ^	Execute macro	Software extension	
MICR commands	**FS a 0**	Read check paper	Mechanical extension	O
	FS a 1	Load check paper to print starting position	Mechanical extension	O
	FS a 2	Eject check paper	Mechanical extension	O
	FS b	Request retransmission of check paper reading result	Mechanical extension	O
	FS c	MICR mechanism cleaning	Mechanical extension	O

The TM-U590/U590P supports the commands marked with a ● in the "Supported Command" column.
The TM-U590/U590P with the MICR reader also supports the commands marked with a O in the "Supported Command" column.

Function Type	Command	Name	Matrix Category	Supported Command
Kanji control commands	**FS !**	Select print mode(s) for Kanji characters	Software extension	
	FS &	Select Kanji character mode	Software extension	
	FS –	Turn underline mode on/off for Kanji characters	Software extension	
	FS .	Cancel Kanji character mode	Software extension	
	FS 2	Define user-defined Kanji characters	Software extension	
	FS C	Select Kanji character code system	Software extension	
	FS S	Set Kanji character spacing	Software extension	
	FS W	Turn quadruple-size mode on/off for Kanji characters	Software extension	
Miscellaneous function commands	**DLE ENQ**	Real-time request to printer	Software extension	●
	ESC =	Select peripheral device	Software extension	●
	ESC @	Initialize printer	Basic single	●
	ESC L	Select page mode	Software extension	
	ESC S	Select standard mode	Software extension	
	ESC p	Generate pulse	Hardware extension	●
	FS L	Select double-density page mode	Software extension	
	GS <	Initialize printer mechanism	Mechanical extension	
	GS A	Adjust label print starting position	Hardware extension	
	GS C 0	Select counter print mode	Software extension	
	GS C 1	Select count mode (A)	Software extension	
	GS C 2	Set counter	Software extension	
	GS C ;	Select count mode (B)	Software extension	
	GS E	Select head control method	Hardware extension	
	GS I	Transmit printer ID	Hardware extension	●
	GS P	Set horizontal and vertical motion units	Software extension	●
	GS c	Print counter	Software extension	
	GS z 0	Set on-line recovery wait time	Software extension	

The TM-U590/U590P supports the commands marked with a ● in the "Supported Command" column.
The TM-U590/U590P with the MICR reader also supports the commands marked with a O in the "Supported Command" column.

Reference Table

Command	Name	Function	Supported Command														
			TM-T85	TM-T88/ T88M	TM-L60II	TM-300/300M				TM-U200		TM-U375/ U375M	TM-H5000/ H5000M	TM-U925	TM-U950/ U950M	TM-295	TM-U590/ U590M	TM-215S
						A	B	C	D	B	D							
HT	Horizontal tab	Moves the printing position to the next horizontal tab position.	●	●	●	●	●	●	●	●	●	●	●			●	●	●
LF	Print and line feed	Prints the data in the print buffer and feeds one line based on the current line spacing.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
FF	1. Print and eject cut sheet (in standard mode)	Prints the data in the print buffer and ejects the cut sheet.										●	●	●	●	●	●	
	2. Print and return to standard mode (in page mode)	Prints the data in the print buffer and returns to standard mode.	●	●	●							●	●			●		
	3. Print and feed label to print starting position (on label)	Prints the data in the print buffer and feeds the next label to the print starting position.			●													
CR	Print and carriage return	When auto line feed is enabled, this command functions in the same way as **LF**. When auto line feed is disabled, this command prints the data in the print buffer and does not feed the paper, or is ignored.	O	O	O	●	●	●	●	●	●	●	●	●	●	O	●	●
CAN	Cancel print data in page mode	Deletes all the print data in the current printing area in page mode.	●	●	●							●	●			●		

The commands supported by each printer are marked by a ● or a O. The functions of the commands marked by a O may differ, depending on the printer model.

Command	Name	Function	Supported Command														
			TM-T85	TM-T88/ T88M	TM-L60II	TM-300/300M				TM-U200		TM-U375/ U375M	TM-H5000/ H5000M	TM-U925	TM-U950/ U950M	TM-295	TM-U590/ U590M	TM-215S
						A	B	C	D	B	D							
RS	Journal tab	Moves the print position to the beginning of the journal paper.													●			
DLE EOT	Real-time status transmission	Transmits a specified status in real time.	●	●	●					●	●	●	●	●	●	●	●	
DLE EOT BS	Real-time MICR status transmission	Transmits MICR status in real time.											O	O	O		O	
DLE ENQ	Real-time request to printer	Responds to a request from the host computer in real time.	●	●						●	●	●	●	●	●		●	
ESC FF	Print data in page mode	Prints the data in the print buffer in page mode.	●	●	●								●					
ESC SP	Set right-side character spacing	Sets the right-side character spacing.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ESC !	Select print mode(s)	Selects a print mode(s).	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ESC $	Set absolute print position	Sets the print starting position from the beginning of the line.	●	●	●							●	●	●	●		●	
ESC %	Select/cancel user-defined character set	Selects or cancels the user-defined character set.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ESC &	Define user-defined characters	Defines user-defined characters for a specified character code.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ESC ＊	Select bit-image mode	Selects a bit-image mode for a specified number of dots.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

The commands supported by each printer are marked by a ● or a O. The functions of the commands marked by a O may differ, depending on the printer model.

Command	Name	Function	Supported Command														
			TM-T85	TM-T88/ T88M	TM-L60II	TM-300/300M				TM-U200		TM-U375/ U375M	TM-H5000/ H5000M	TM-U925	TM-U950/ U950M	TM-295	TM-U590/ U590M	TM-215S
						A	B	C	D	B	D							
ESC –	Turn underline mode on/off	Turns underline mode on or off.	●	●	●	O	O	O	O	●	●	●	●	●	●		●	
ESC 2	Select default line spacing	Sets the line spacing to 1/6 inch.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ESC 3	Set line spacing	Sets the line spacing to a specified value.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ESC <	Return home	Moves the print head to the home position.				●	●	●	●	●	●	●	●	●	●		●	
ESC =	Select peripheral device	Selects the device to which the host computer sends data.	●	●	●					●	●	●	●	●	●	●	●	
ESC ?	Cancel user-defined characters	Cancels the user-defined characters for a specified character code.	●	●	●					●	●	●	●	●	●		●	
ESC @	Initialize printer	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.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ESC C	Set cut sheet eject length	Sets the eject length for a cut sheet to a specified number of lines.										●	●	●	●	●	●	
ESC D	Set horizontal tab positions	Sets the horizontal tab positions.	●	●	●	●	●	●	●	●	●	●	●			●	●	●
ESC E	Turn emphasized mode on/off	Turns emphasized mode on or off.	●	●	●	O	O	O	O	●	●	●	●	●	●		●	
ESC F	Set/cancel cut sheet reverse eject	Sets or cancels the cut sheet reverse eject.											●			●	●	

The commands supported by each printer are marked by a ● or a O. The functions of the commands marked by a O may differ, depending on the printer model.

Command	Name	Function	Supported Command														
			TM-T85	TM-T88/ T88M	TM-L60II	TM-300/300M				TM-U200		TM-U375/ U375M	TM-H5000/ H5000M	TM-U925	TM-U950/ U950M	TM-295	TM-U590/ U590M	TM-215S
						A	B	C	D	B	D							
ESC G	Turn double-strike mode on/off	Turns double-strike mode on or off.	●	●	●	O	O	O	O	●	●	●	●	●	●		●	
ESC J	Print and feed paper	Prints the data in the print buffer and feeds the paper a specified distance.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ESC K	Print and reverse feed	Prints the data in the print buffer and feeds the paper a specified distance in the reverse direction.							●		●		●	●	●	●	●	
ESC L	Select page mode	Switches from standard mode to page mode.	●	●	●							●	●			●		
ESC R	Select an international character set	Selects a country's character set.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ESC S	Select standard mode	Switches from page mode to standard mode.	●	●	●								●					
ESC T	Select print direction in page mode	Selects the print direction and starting position in page mode.	●	●	●							●	●			●		
ESC U	Turn unidirectional printing mode on/ off	Turns unidirectional printing mode on or off.				●	●	●	●	●	●	●	●	●	●		●	●
ESC V	Turn 90° clockwise rotation mode on/off	Turns 90° clockwise rotation mode on or off.	●	●	●							●	●					
ESC W	Set printing area in page mode	Sets the position and size of the printing area in page mode.	●	●	●							●	●			●		

The commands supported by each printer are marked by a ● or a O. The functions of the commands marked by a O may differ, depending on the printer model.

Command	Name	Function	Supported Command															
			TM-T85	TM-T88/ T88M	TM-L60II	TM-300/300M				TM-U200		TM-U375/ U375M	TM-H5000/ H5000M	TM-U925	TM-U950/ U950M	TM-295	TM-U590/ U590M	TM-215S
						A	B	C	D	B	D							
**ESC **	Set relative print position	Sets the print starting position based on the current position.	●	●	●							●	●	●	●		●	
ESC a	Select justification	Aligns all the data in one line to a specified position.	●	●	●					●	●	●	●	●	●		●	
ESC c 0	Select paper type(s) for printing	Selects paper type(s) for printing.						●	●			●	●	●	●			
ESC c 1	Select paper type(s) for command settings	Selects paper type(s) for use with various command settings.										●	●	●	●			
ESC c 3	Select paper sensor(s) to output paper-end signals	Selects paper sensor(s) to output paper-end signals.	O	O	O	O	O	O	O	O	O	O	O		O	O	O	
ESC c 4	Select paper sensor(s) to stop printing	Selects the paper sensor(s) that stops printing when the paper runs out.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
ESC c 5	Enable/disable panel buttons	Enables or disables the panel buttons.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ESC d	Print and feed ***n*** lines	Prints the data in the print buffer and feeds ***n*** lines.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ESC e	Print and reverse feed ***n*** lines	Prints the data in the print buffer and feeds ***n*** lines in the reverse direction.							●		●		●	●	●	●	●	

The commands supported by each printer are marked by a ● or a O. The functions of the commands marked by a O may differ, depending on the printer model.

Command	Name	Function	Supported Command														
			TM-T85	TM-T88/ T88M	TM-L60II	TM-300/300M				TM-U200		TM-U375/ U375M	TM-H5000/ H5000M	TM-U925	TM-U950/ U950M	TM-295	TM-U590/ U590M	TM-215S
						A	B	C	D	B	D							
ESC f	Set cut sheet wait time	Sets the time that the printer waits for cut sheet to be inserted and the time from insertion of the sheet until printing starts.						●	●			●	●	●	●	●	●	
ESC i	Partial cut (one point left uncut)	Executes a partial cut of the paper with one point left uncut.	●			●	●							●	●			
ESC m	Partial cut (three points left uncut)	Executes a partial cut of the paper with three points left uncut.				●	●							●	●			
ESC o	Stamp	Executes stamp printing.												●	●			
ESC p	Generate pulse	Outputs a specified pulse to a specified connector pin.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ESC q	Paper release	Releases the paper.										●	●			●	●	
ESC r	Select print color	Selects the print color.				●	●	●	O		O							●
ESC t	Select character code table	Selects a page from the character code table.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ESC u	Transmit peripheral device status	Transmits the status of a specified connector pin.	●		●	O	O	O	O			●		●	●	●		●
ESC v	Transmit paper sensor status	Transmits the status of a paper sensor.	●		●	O	O	O	O			●		●	●	●		●
ESC z	Turn parallel printing mode on/ off for receipt and journal paper	Turns parallel printing mode on or off for receipt and journal paper.													●			

The commands supported by each printer are marked by a ● or a O. The functions of the commands marked by a O may differ, depending on the printer model.

Command	Name	Function	Supported Command															
			TM-T85	TM-T88/ T88M	TM-L60II	TM-300/300M				TM-U200		TM-U375/ U375M	TM-H5000/ H5000M	TM-U925	TM-U950/ U950M	TM-295	TM-U590/ U590M	TM-215S
						A	B	C	D	B	D							
ESC {	Turn upside-down printing mode on/ off	Turns upside-down printing mode on or off.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
FS !	Select print mode(s) for Kanji characters	Selects print mode(s) for Kanji characters.		O		O	O	O	O			O	O		O		O	
FS &	Select Kanji character mode	Selects Kanji character mode.		O		O	O	O	O			O	O		O		O	
FS –	Turn underline mode on/off for Kanji characters	Turns underline mode on or off for Kanji characters.		O		O	O	O	O			O	O		O		O	
FS .	Cancel Kanji character mode	Cancels Kanji character mode.		O		O	O	O	O			O	O		O		O	
FS 2	Define user-defined Kanji characters	Defines user-defined Kanji characters for specified character codes.		O		O	O	O	O			O	O		O		O	
FS C	Select Kanji character code system	Selects the Kanji character code system.		O		O	O	O	O			O	O		O		O	
FS L	Select double-density page mode	Switches from standard mode to double-density page mode.										O						
FS S	Set Kanji character spacing	Sets the right- and left-side Kanji character spacing.		O		O	O	O	O			O	O		O		O	
FS W	Turn quadruple-size mode on/off for Kanji characters	Turns quadruple-size mode on or off for Kanji characters.		O		O	O	O	O			O	O		O		O	
FS a 0	Read check paper	Selects the MICR function and reads the check paper.											O	O	O		O	

The commands supported by each printer are marked by a ● or a O. The functions of the commands marked by a O may differ, depending on the printer model.

Command	Name	Function	Supported Command														
			TM-T85	TM-T88/ T88M	TM-L60II	TM-300/300M				TM-U200		TM-U375/ U375M	TM-H5000/ H5000M	TM-U925	TM-U950/ U950M	TM-295	TM-U590/ U590M	TM-215S
						A	B	C	D	B	D							
FS a 1	Load check paper to print starting position	Loads check paper to the print starting position.											O	O	O		O	
FS a 2	Eject check paper	Ejects the check paper.											O	O	O		O	
FS b	Request retransmission of check paper reading result	Retransmits the previous check paper reading results.											O	O	O		O	
FS c	MICR mechanism cleaning	Cleans the MICR mechanism.											O	O	O		O	
GS ENQ	Transmit real-time printer status	Transmits the status of the printer in real time.												●	●			
GS FF	Print and eject label	Prints the data in the print buffer and ejects the label.			●													
GS !	Select character size	Selects the character width and height.	●	●	●								●				●	
GS $	Set absolute vertical print position in page mode	Sets the absolute vertical print starting position in page mode.	●	●	●								●					
GS *	Define downloaded bit image	Defines a downloaded bit image using a specified number of dots.	●	●	●							●	●	●	●		●	
GS /	Print downloaded bit image	Prints a downloaded bit image using a specified mode.	●	●	●							●	●	●	●		●	
GS :	Start/end macro definition	Starts or ends a macro definition.	●	●	●								●					

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						A	B	C	D	B	D							
GS <	Initialize printer mechanism	Feeds a label to the print starting position.			●													
GS A	Adjust label position to start printing	Adjusts the label position relative to the default position.			●													
GS B	Turn white/black reverse printing mode on/off	Turns white/black reverse printing mode on or off.	●	●	●								●					
GS C 0	Select counter print mode	Selects a print mode for the serial counter.			●													
GS C 1	Select count mode (A)	Selects a count mode for the serial counter.			●													
GS C 2	Set counter	Sets the serial counter value.			●													
GS C ;	Select count mode (B)	Selects a count mode for the serial counter and specifies the counter value.			●													
GS E	Select head control method	Selects the print speed and head energizing time.				●	●	●	●			●		●	●			
GS H	Select printing position of HRI characters	Selects the printing position of HRI characters when printing a bar code.	●	●	●								●					
GS I	Transmit printer ID	Transmits a specified printer ID.	●	●	●					●	●	●	●	●	●	●	●	
GS L	Set left margin	Sets the left margin using specified values.	●	●	●							●	●				●	
GS P	Set horizontal and vertical motion units	Sets the horizontal and vertical motion units.	●	●	●							●	●	●	●		●	

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						A	B	C	D	B	D							
GS V	Select cut mode and cut paper	Cuts the specified paper.	●	●						●			●					
GS V	Select cut mode and cut paper	Advances the specified paper to the cut position and performs the cut.	●	●						●	●		●					
GS W	Set printing area width	Sets the printing area width to a defined area.	●	●	●							●	●				●	
**GS **	Set relative vertical print position in page mode	Moves the vertical print starting position in page mode to a specified distance from the current position.	●	●	●								●					
GS ^	Execute macro	Executes a macro.	●	●	●								●					
GS a	Enable/disable Automatic Status Back (ASB)	Selects a status for ASB transmission.	●	●	●					●	●	●	●	●	●	●	●	
GS b	Turn smoothing mode on/off	Turns smoothing mode on or off.	●	●	●								●					
GS c	Print counter	Stores a serial counter value in the print buffer and increments or decrements the counter value.			●													
GS f	Select font for HRI characters	Selects a font for the HRI characters used when printing a bar code.	●	●	●								●					
GS h	Set bar code height	Sets the height of a bar code.	●	●	●								●					

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						A	B	C	D	B	D							
GS k	Print bar code	Selects a bar code system and prints the bar code.	●	●	●								●					
GS r	Transmit status	Transmits a specified status.	●	●	●					●	●	●	●	●	●	●	●	
GS w	Set bar code width	Sets the horizontal size of the bar code.	●	●	●								●					
GS z 0	Set on-line recovery wait time	Sets the on-line recovery wait time.								●	●							
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