CITIZEN

Command Reference

LINE THERMAL PRINTER

MODEL CBM1000II

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REVISION

Rev.No.	Date	Comment
Rev. 1.00	2001/10/19	Newly issued
Rev. 2.00	2002/05/09	Added "GS p" on Page 89.
Rev. 2.01	2003/06/19	Added parameter on ESC t (After MPV3.12000).

1. PRINT CONTROL FUNCTIONS

1.1 Command List

No.	Command	Function	Mode	Code	Page
1	HT	Horizontal tab	S.P.	<09>H	6
2	LF	Printing and paper feed	S.P.	<0A>H	7
3	CR	Back to printing	S.P.	<0D>H	8
4	FF	Printing in PAGE MODE and returning to STANDARD MODE	P	<0C>H	9
		Printing and paper feeding to the top of the Label (Black mark position)	S		
5	CAN	Canceling print data in PAGE MODE	P	<18>H	10
6	DLE EOT	Sending status in real-time	S.P.	<10>H<04>H<n>	11
7	DLE ENQ	Real-time request to printer	S.P.	<10>H<05>H<n>	14
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10	ESC RS	Buzzer-on	S.P.	<1B>H<1E>H	16
11	ESC SP	Setting the right spacing of the character	S.P.*	<1B>H<20>H<n>	17
12	ESC !	Collectively specifying the printing mode	S.P.	<1B>H<21>H<n>	19
13	ESC $	Specifying the absolute positions	S.P.*	<1B>H<24>H<n1> <n2>	21
14	ESC %	Specifying/Canceling download character set	S.P.	<1B>H<25>H<n>	23
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20	ESC =	Data input control	S.P.	<1B>H<3D>H<n>	31
21	ESC ?	Deleting download characters	S.P.	<1B>H<3F>H<n>	32
22	ESC @	Initializing the printer	S.P.	<1B>H<40>H	33
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26	ESC J	Printing and feeding paper in minimum pitch	S.P.*	<1B>H<4A>H<n>	37
27	ESC L	Selecting PAGE MODE	S	<1B>H<4C>H	38
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29	ESC R	Selecting the international character set	S.P.	<1B>H<52>H<n>	40
30	ESC S	Selecting STANDARD MODE	P	<1B>H<53>H	41

No.	Command	Function	Mode	Code	Page
55	GS W	Setting the print area width	S.P.*	<1D>H<57>H<nL><nH>	71
56	GS \	Specifying the relative vertical position of a character in PAGE MODE	S.P.*	<1D>H<5C>H<nL><nH>	73
57	GS ^	Executing the macro	S.P.	<1D>H<5E>H<n1><n2><n3>	74
58	GS a	Enabling/Disabling ASB (Automatic Status Back)	S.P.	<1D>H<61>H<n>	75
59	GS b	Specifying/Canceling the smoothing	S.P.	<1D>H<62>H<n>	78
60	GS f	Selecting the font of HRI characters	S.P.	<1D>H<66>H<n>	79
61	GS h	Specifying the height of the bar code	S.P.	<1D>H<68>H<n>	80
62	GS k	Printing the bar code	S.P.	(1)<1D>H<6B>H<m>[d1...dk]NUL (2)<1D>H<6B>H<m><n>[d1...dn]	81
63	GS p	Selecting the paper mode	S	<1D>H<70>H<n>	89
64	GS r	Sending status	S.P.	<1D>H<72>H<n>	90
65	GS v0	Printing of raster bit image	S	<1D>H<76>H<30>H<m><xL><xH><yL><yH>[<d>]k	92
66	GS w	Specifying the horizontal size (magnification) of bar code	S.P.	<1D>H<77>H<n>	94

Command relative to NV memory

No.	Command	Function	Mode	Code	Page
67	FS g3	Writing data into the download user NV memory	S	<1C>H<67>H<33><m>H<a1>H<a2>H<a3>H<a4>H<nL>H<nH>H[<d>]nL+(nH×256)	95
68	FS g4	Reading data from the download user NV memory	S.P.	<1C>H<67>H<34>H<m>H<a1>H<a2>H<a3>H<a4>H<nL>H<nH>H	97
69	FS p	Printing the download NV bit images	S	<1C>H<70>H<n><m>	99
70	FS q	Defining the download NV bit image	S	<1C>H<71>H<n>H	101

Label Control

No.	Command	Function	Mode	Code	Page
71	GS FF	Printing and discharging the labels	S	<1D>H<0C>H	104
72	GS <	Initialiging the printer mechanism	S.P.	<1D>H<3C>H	105
73	GS A	Correcting the label top position	S.P.	<1D>H<41>H<m><n>	105
74	GS C0	Setting the numbering print mode	S.P.	<1D>H<43>H <30>H<m><n>	106
75	GS C1	Setting the numbering counter mode (A)	S.P.	<1D>H<43>H <31>H<n1><n2> <n3><n4><n5><n6>	107
76	GS C2	Setting the numbering counter	S.P.	<1D>H<43>H <32>H<n1><n2>	108
77	GS C;	Setting the numbering counter mode (B)	S.P.	<1D>H<43>H<3B> H<N1><3B>H<N2> <3B>H<N3><3B> H<N4><3B>H <N5><3B>H	109
78	GS c	Print the counter	S.P.	<1D>H<63>H	110
79	GS I	Setting the label length	S.P.	<1d>H<6C>H <n1L><n1H> <n2L><n2H>	110

In the Mode column: S = STANDARD MODE, P = PAGE MODE
* shows the command affected by GS P.

Commands Nos. 71, 72, 73, and 79 are available only if the "Label" (Black mark) feature is specified.

1.2 Command Details

1.2.1 Descriptions of Each Item

XXXX

[Function]	The name of a command.
[Code]	The string of codes comprising the command is represented by < >H for hexadecimal numbers, < >B for binary numbers, and < > for decimal numbers, [ ] k denotes the number of repetition of "k" times.
[Range]	Indicates the values (setting range) of argumeuts of the command.
	Note: If values outside the defined domain specified with control codes are used, malfunctions could possibly occur, so be sure to use the values within the defined domain.
[Outline]	Describes the functions of the command.
[Caution]	Describes important points and cautionary notes, as required.
[Default]	Initial values for the command if it has arguments.
[Reference]	Describes commands related to the command when it is used.
[Sample Program]	Describes examples of coding on Quick-Basic.
	※ Examples are only for reference. They may vary depending on language and version. For details, please refer to a manual in your language.
[Printing Result]	Describes the print results obtained by executing the above programs. However, the print results shown are different in scale from actual print results.

1.2.2 Command Details

HT

[Function]	Horizontal tab
[Code]	<09>H
[Outline]	Shifts the printing position to the next horizontal tab position.
	• Ignored when the next horizontal tab position has not been set.
[Caution]	• The horizontal tab position is set by ESC D.
	• The initial setting of horizontal tab positions is at intervals of 8 characters for font A at 9th, 17th, 25th, 33rd, columns.
[See Also]	ESC D

[Sample Program]

```
LPRINT "0123456789012345678901";
LPRINT CHR$(&HA);
LPRINT CHR$(&H9) + "AAA";
LPRINT CHR$(&H9) + "BBB";
LPRINT CHR$(&HA) ;
LPRINT CHR$(&H1B) + "D";
LPRINT CHR$(3) + CHR$(7) + CHR$(14) + CHR$(0);
LPRINT CHR$(&H9) + "AAA";
LPRINT CHR$(&H9) + "BBB";
LPRINT CHR$(&H9) + "CCC" + CHR$(&HA) ;
END
```

[Printing Result]

```
12345678901234567890

        AAA    BBB   ←——   Initially set horizontal tab
AAA  BBB      CCC    ←——   When set to the 4th, 8th, and 15th columns
```

LF

[Function]	Printing and paper feed
[Code]	<0A>H
[Outline]	Prints data inside the print buffer and feeds paper based on the line feed amount having been set.
[Caution]	The head of the line becomes the next print starting position.
[See Also]	ESC 2, ESC 3

[Sample Program]

LPRINT "AAA" + CHR$(&HA) ;
LPRINT "BBB" + CHR$(&HA) ;
LPRINT CHR$(&HA) ;
LPRINT "CCC" + CHR$(&HA) ;
END

[Print Results]

AAA ⟵——— Print and line feed
BBB ⟵——— Print and line feed
⟵——— Line feed only
CCC ⟵——— Print and line feed

CR

[Function]	Back to printing
[Code]	<0D>H

[Outline]

1) When DSW1-5 is OFF:

   This command is ignored.

2) When DSW1-5 is ON:

   With data held inside the internal print buffer, printing and line feed are performed.

   Without data inside the internal print buffer, however, only line feed is performed.

[See Also]   LF

[Sample Program]

```
LPRINT "AAA" + CHR$(&HD) ;
LPRINT "BBB" + CHR$(&HD) ;
LPRINT CHR$(&HD) ;
LPRINT "CCC" + CHR$(&HD) ;
END
```

[Print Results]

AAA	⟵———	Print and line feed
BBB	⟵———	Print and line feed
	⟵———	Line feed only
CCC	⟵———	Print and line feed

FF (Page Mode)

[Function]	Printing in PAGE MODE and returning to STANDARD MODE
[Code]	<0C>H
[Outline]	Executes a batch printout of the data mapped in the entire print area, and then returns to STANDARD MODE.
[Caution]	• All mapped data is erased after printout.
	• The print area set up by ESC W is initialized.
	• This command does not execute a paper cut.
	• After this command is executed, the beginning of the line is taken as the start position for the next print.
	• This command is only effective when the PAGE MODE is selected.
[See Also]	ESC FF, ESC L, ESC S, GS FF

FF (Standard Mode)

[Function]	Printing and paper feeding to the top of the label (Black mark position)
[Code]	<0C>H
[Outline]	This command prints the data in the printer buffer and searches for the head of the next label (Black mark position)
[Caution]	This command is valid only when the label printer is selected with DS2-7. It is ignored when the thermal paper is specified. After sending one label worth of print data, be sure to send this command or GS FF command. After the user intentionally moved the label paper, this command cannnot search for the head of the label properly.
[See Also]	GS FF, GS <

[Sample Program]

[Print Result]

```
LPRINT "ABC" ; CHR$ (&HA) ;
LPRINT "123" ; CHR$ (&HC) ;
LPRINT "HHHHH" ; CHR$ (&HA) ;
LPRINT "gggg" ; CHR$ (&HC) ;
END
```

```
ABC
123
```

```
HHHHH
g g g g g
```

CAN

[Function]	Canceling print data in PAGE MODE
[Code]	<18>H
[Outline]	Erases all data contained in the currently effective print area in PAGE MODE.
[Caution]	• This command is only effective when PAGE MODE is selected.
	• If the previously established print area overlaps the currently effective print area, the overlapped data in the previously established area will be erased.
[See Also]	ESC L, ESC W

DLE EOT n

[Function]	Sending status in real-time
[Code]	<10>H<04>H<n>
[Range]	1 ≦ n ≦ 4
[Outline]	Sends in real-time the status specified by "n".

n	Status
1	Printer status
2	Status caused by an offline condition
3	Status caused by an error
4	Continuous paper detector status

[Caution]

• Each status represents the current status. lt is 1 byte data.

• The status is transferred without checking whether the host is ready to receive or busy.

• This command is executed even if the printer is in offline state, receive-buffer full state, or error state.

• This command is dealt with when it is received.

• If another data string of <10>H<04>H<n> (1 ≦ n ≦ 4) is received, the printer acts the same way as with this command. Therefore, the user should be reminded of this fact.

[Example 1]

Suppose a command "ESC * mnL nH [d1 ... dk]", where d1 = <10>H, d2 = <04>H, d3 = <01>H.

• The DLE EOT n command cannot be interleaved into the code string of another command consisting of 2 bytes or more.

[Example 2]

If the printer sends DLE EOT 3 after the host has sent up to ESC 3 in its attempt to send ESC 3 n, the printer handles the ESC 3 as ESC 3 <10>H. Thus, the user should be cautious.

• If ASB (Automatic Status Back) is enabled by GS a, it is necessary to discriminate between the status due to ASB and the status due to this command.

(1) Printer status (When n = 1 is specified)

Bit	Status	Hex.	Decimal
0	Unused	00	0
1	Unused	02	2
2	Status of pin 3 of Drawer Kick-Out Connector = L	00	0
	Status of pin 3 of Drawer Kick-Out Connector = H	04	4
3	Online status	00	0
	Offline status	08	8
4	Unused	10	16
5	Undefined	—	—
6	Undefined	—	—
7	Unused	00	0

(2) Status caused by an offline condition (When n = 2 is specified)

Bit	Status	Hex.	Decimal
0	Unused	00	0
1	Unused	02	2
2	Cover closed	00	0
	Cover open	04	4
3	Not in paper feed state triggered by FEED switch	00	0
	In paper feed state triggered by FEED switch	08	8
4	Unused	10	16
5	Printing is not stopped because of "paper out" state	00	0
	Printing is stopped because of "paper out" state	20	32
6	Error not occurred	00	0
	Error occurred	40	64
7	Unused	00	0

Bit 5: Printing is stopped if the paper end detector detects a "paper out" state, or if the printer is out of paper when the Paper Near-end Sensor is enabled by ESC c 4. At this time, bit 5 = "1".

(3) Status caused by an error (when n = 3 is specified)

Bit	Status	Hex.	Decimal
0	Unused	00	0
1	Unused	02	2
2	No label detection error occurred (only when "Label" is selected).	00	0
	A label detection error occurred (only when "Label" is selected).	04	4
3	Auto cutter error not occurred	00	0
	Auto cutter error occurred	08	8
4	Unused	10	16
5	Unrecoverable error not occurred	00	0
	Unrecoverable error occurred	20	32
6	Auto recovery error not occurred	00	0
	Auto recovery error occurred	40	64
7	Undefined	00	0

Bit 3: If this error occurred because of a paper jam, for example, remove the cause of the error, and then DLE ENQ n (1 $\leqq$ n $\leqq$ 2) can be used to recover from the error. However, it is not possible to recover from any error due to a circuit problem (e.g., broken wire).

Bit 6: If a head overheat error is detected, the printing is stopped until the head temperature falls. At this time, bit 6 = "1".

(4) Continuous paper detector status (When n = 4 is specified)

Bit	Status	Hex.	Decimal
0	Unused	00	0
1	Unused	02	02
2,3	Paper found by Paper Near-end Sensor	00	0
	Paper not found by Paper Near-end Sensor	0C	12
4	Unused	10	16
5,6	Paper found by Paper-end Sensor	00	0
	Paper not found by Paper-end Sensor	60	96
7	Unused	00	0

[See Also]   DLE ENQ, GS a, GS r

DLE ENQ n

[Function]	Real-time request to printer
[Code]	<10>H<05>H<n>
[Range]	$1 \leqq n \leqq 2$
[Outline]	The printer responds in real-time to the request that the host specifies with number "n".

n	Function
1	After recovering from an error, the printer resumes printing from the beginning of the line where the error occurred.
2	The printer clears the receive buffer and the print buffer, and then recovers from the error.

[Caution]

- This command is only effective if an auto cutter error has occurred.
- This command is dealt with when it is received.
- This command is also executed even if the printer is in a receive-buffer full state.
- If another data string of <10>H<05>H<n> ($1 \leqq n \leqq 2$) is received, the printer acts in the same way as with this command. The user should, therefore, be reminded of this fact.

[Example 1]

If, for example, a command "ESC * m nL nH {d} k", where d1 = <10>H, d2=<05>H, d3=<01>H1, is given, the DLE ENQ n command cannot be interleaved into the code string of another command consisting of two bytes or more.

[Example 2]

- If the printer sends DLE ENQ 2 when the host has sent up to ESC 3 in its attempt to send ESC 3 n, the printer treats the ESC 3 as ESC 3 <10>H. Thus, the user should be careful.
- Even if DLE ENQ 2 is executed, the settings made by, for example, ESC ! and ESC 3 retain the conditions when the error occurred. A combined use of this command and ESC @ can completely initialize the printer.

[See Also]	DLE EOT

DLE DC4 n m t

[Function]	Outputting specified pulse in real-time.
[Code]	<10>H<14>H<n><m><t>
[Range]	n=1, m=0,1
	$1 \leqq t \leqq 8$
[Outline]	A signal specified with "t" is output to the connector pin specified with "m".

m	Connector pin
0	Pin No. 2 of drawer Kick-Out Connector
1	Pin No. 5 of drawer Kick-Out Connector

[Details]	• On-time and off-time are set at t × 100 msec, respectively.
	• In case an error occurred during the processing of this command, the command is ignored.
	• In case (ESC p or DLE DC4 under execution), during the processing of this command the command is ignored.
	• This command will be processed as it is received.
	• In specification of serial interface, the command is executed even in offline, reception buffer full and error conditions.
	• In specification of parallel interface, this command cannot be executed while the printer is BUSY.
	• This command will be valid, even if specifying the printer is invalid due to the selection of peripheral units (ESC =).
[Caution]	• If another command with the same data string as this is received, the printer operates the same way as with this command. The user should, therefore, be careful.
	• The command cannot be inserted in another string of commands which consist of codes of 2 bytes or more.
[Reference]	ESC p

ESC FF

[Function]	Printing data in PAGE MODE
[Code]	<1B>H<0C>H
[Outline]	Executes a batch printout of the data mapped in the entire print area in PAGE MODE.
[Caution]	• This command is only effective when PAGE MODE is selected.
	• Mapped data, as well as the ESC T and ESC W settings, and the character mapping position are held even after printing.
[See Also]	FF, ESC L, ESC S

ESC RS

[Function]	Sound Buzzer
[Code]	<1B>H<1E>H
[Outline]	Sound the buzzer for 200 ms.
[Caution]	This command is buffered before execution.
[Sample Program]	LPRINT CHR$(&H1B);CHR$(&H1E);
[Execution Result]	The buzzer sounds for approx. 200 ms.

ESC SP n

[Function]	Setting the right spacing of the character
[Code]	<1B>H<20>H<n>
[Range]	0 ≦ n ≦ 255
[Outline]	Sets the right spacing of character to [n × basic calculation pitch] inches.
[Caution]	• If the horizontal magnification of character is 2 or more, the right spacing increases with the magnification.
	• The right spacing can be set separately for the STANDARD and PAGE MODES.
	• The basic calculation pitch is set by GS P. Once defined, the right spacing is not changed if the basic calculation pitch is changed by GS P.
	• Fractions resulting from calculation are corrected with the minimum pitch of the mechanism, and the remainder is omitted.
	• In STANDARD MODE, this command uses the horizontal basic calculation pitch (x).
	• In PAGE MODE, the basic calculation pitch used by this command depends on the start point:
	(1) If the start point specified by ESC T is top left or bottom right, the command uses the horizontal basic calculation pitch (x).
	(2) If the start point specified by ESC T is top right or bottom left, the command uses the vertical basic calculation pitch (y).
	• The maximum right spacing is capable of approximately 31.906 mm (255/203 inches). A setting greater than this maximum is trimmed to the maximum.
[Default]	n = 0
[See Also]	GS P

[Sample Program]

```
LPRINT CHR$(&H1B)  + "  " + CHR$(0) ;
LPRINT "AAAAA" + CHR$(&HA) ;
LPRINT CHR$(&H1B)  + "  " + CHR$(1) ;
LPRINT "AAAAA" + CHR$(&HA) ;
LPRINT CHR$(&H1B)  + "  " + CHR$(12) ;
LPRINT "AAAAA" + CHR$(&HA) ;
END
```

[Print Results]

AAAAA   ←———   0-dot space

A A A A A   ←———   1-dot space

A   A   A   A   A ←———   12-dots space

ESC ! n

[Function]	Collectively specifying the printing mode
[Code]	<1B>H<21>H<n>
[Range]	0 ≦ n ≦ 255
[Outline]	Printing mode is assigned.

Bit	Function	Value	
		0	1
0	Character Font	Font A	Font B
1	Undefined		
2	Undefined		
3	Emphasis	Canceled	Specified
4	Double height	Canceled	Specified
5	Double width	Canceled	Specified
6	Undefined		
7	Underline	Canceled	Specified

[Caution]

- With double height and double width being specified simultaneously, quadruple characters are created.
- An underline is attached to the full character width, which, however, is not attached to the part having been skipped by the horizontal tab. Neither is it attached to 90°-right-turned characters.
- The underline width is as specified by the <ESC –> command. (The default setting is 1 dot width.)
- In case characters with different vertical magnification ratios coexist on the same line, they are printed on the same base line.

[Default]	n = 0
[See Also]	ESC E, ESC –, GS !

```
LPRINT CHR$(&H1B) + "!" + CHR$(&H00) + "H" ;
LPRINT CHR$(&H1B) + "!" + CHR$(&H01) + "H" ;
LPRINT CHR$(&H1B) + "!" + CHR$(&H08) + "H" ;
LPRINT CHR$(&H1B) + "!" + CHR$(&H10) + "H" ;
LPRINT CHR$(&H1B) + "!" + CHR$(&H20) + "H" ;
LPRINT CHR$(&H1B) + "!" + CHR$(&HB9) + "H" ;
LPRINT CHR$(&HA) ;
END
```

[Print Results]

Font A
Font B
Font A + Emphasis

Font B + Emphasis + Quadruple + Underline
Font A + Underline
Font A + Double Width
Font A + Double Height

— 20 —

ESC $ n1 n2

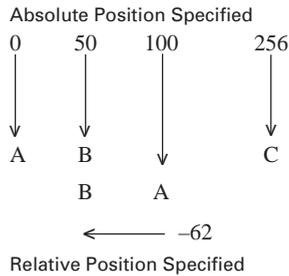|	
[Function]	Specifying the absolute positions
[Code]	<1B>H<24>H<n1><n2>
[Range]	$0 \leqq n1 \leqq 255$
	$0 \leqq n2 \leqq 255$
[Outline]	The printing start position is specified with the number of dots (1/203 inch unit) from the beginning of a line.
	• The number of dots is divided by 256, whose quotient is taken as "n2" and the residual as "n1".
	• Therefore, the printing start position is equal to $n1 + n2 \times 256$ from the beginning of a line.
[Caution]	The basic calculation pitch is set by GS P. After the line feed width is set, if the basic calculation by GS P leaves a fraction, the fraction is corrected with the minimum pitch of the mechanism, and the remainder is omitted.
	In STANDARD MODE, this command uses the horizontal (Paper feed direction) basic calculation pitch (x).
	In PAGE MODE, this command acts differently depending on the start point:
	(1) If the start point specified by ESC T is top right or bottom left, the command uses the vertical (Paper feed direction) basic calculation pitch (y).
	(2) If the start point specified by ESC T is top left or bottom right , the command uses the horizontal (Perpendicular to the paper feed direction) basic calculation pitch (x).
	Specification beyond the end of the line is ignored.
[Default]	The initial value is not defined.
[See Also]	ESC \, GS P, GS \, GS $

[Sample Program]

```
LPRINT CHR$(&H1B) + "$" ;
LPRINT CHR$(0) + CHR$(0) + "A" ;
LPRINT CHR$(&H1B) + "$" ;
LPRINT CHR$(50) + CHR$(0) + "B" ;
LPRINT CHR$(&H1B) + "$" ;
LPRINT CHR$(0) + CHR$(1) + "C" ;
LPRINT CHR$(&HA) ;
LPRINT CHR$(&H1B) + "$" ;
LPRINT CHR$(100) + CHR$(0) + "A" ;
LPRINT CHR$(&H1B) + "\" ;
LPRINT CHR$(&HC2) + CHR$(&HFF) + "B" ;
LPRINT CHR$(&HA);
END
```

[Print Results]

Absolute Position Specified

```
0       50      100           256
|       |       |              |
|       |       |              |
v       v       v              v
A       B       |              C
                v
        B       A
        <--------- -62
```

Relative Position Specified

ESC ％ n

[Function]	Specifying/Canceling download character set
[Code]	<1B>H<25>H<n>
[Range]	0 ≦ n ≦ 255
[Outline]	Specifying/canceling download characters.

• Only the lowest bit (n0) is valid for n.

n0	Function
0	Canceling download character set
1	Specifying download character set

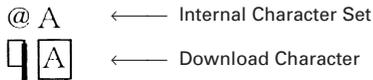|	
[Caution]	Download characters and download bit images cannot be defined simultaneously.
[Default]	n = 0
[See Also]	ESC &

[Sample Program]

```
          GOSUB SETCHR                              DATA 6
          LPRINT CHR$(&H1B) + "%" + CHR$(0) ;       DATA &HEF, &H80, &H00
          LPRINT "@A" + CHR$(&HA) ;                 DATA &H80, &H80, &H00
          LPRINT CHR$(&H1B) + "%" + CHR$(1) ;       DATA &H80, &H80, &H00
          LPRINT "@A" +CHR$(&HA) ;                  DATA &H80, &H80, &H00
          END                                       DATA &HFF, &HFF, &HFF
       SETCHR:                                      DATA &HFF, &HFF, &HFF
          LPRINT CHR$(&H1B) + "&" ;                 DATA 12
          LPRINT CHR$(3) + "@" + "A";               DATA &HFF, &HFF, &HFF
          FOR J=1 TO 2                              DATA &H80, &H07, &HF9
          READ REP                                  DATA &H80, &HFF, &HF9
          LPRINT CHR$(REP) ;                        DATA &H87, &HFE, &H01
          FOR I=1 TO REP*3                          DATA &H9F, &H06, &H01
          READ D                                    DATA &HF8, &H06, &H01
          LPRINT CHR$(D)                            DATA &HF8, &H06, &H01
          NEXT I                                    DATA &H9F, &H06, &H01
          NEXT J                                    DATA &H87, &HFE, &H01
          RETURN                                    DATA &H80, &HFE, &HF9
                                                    DATA &H80, &H07, &HF9
                                                    DATA &HFF, &HFF, &HFF
```
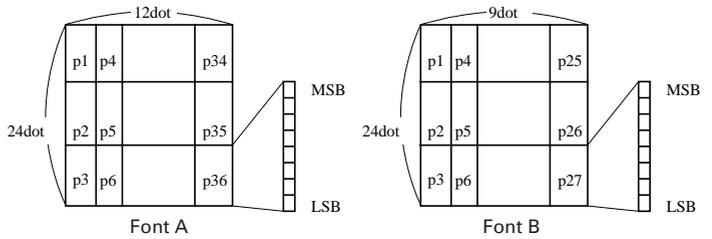
[Print Results]

@ A ⟵——— Internal Character Set

⎍ A ⟵——— Download Character

— 23 —

ESC & s n m [a [p] s×a] m−n+1

[Function]	Defining the download characters
[Code]	<1B>H<26>H<s>H<n><m>[<a><p1><p2> · · <ps × a>]m-n+1
[Range]	s = 3
	$32 \leqq n \leqq m \leqq 126$
	$0 \leqq a \leqq 12$ (Font A)
	$0 \leqq a \leqq 9$ (Font B)
	$0 \leqq p1 · · ps × a \leqq 255$
[Outline]	Defines the font of download characters of alphanumeric characters.

- "s" indicates the number of bytes in vertical direction.
- "n" indicates the start character code and "m" the end character code. To define only one character, set n=m.
- Character codes definable includes 95 ASCII codes in total in the range of <20>H to <7E>H.
- "a" indicates the number of dots to be defined in horizontal direction.
- "p" is the data to be defined, which indicate a pattern equal to "a" dots in horizontal direction from the left end. The rest of the pattern on the right side is filled with space.

  The number of data to be defined is s × a.
- Download characters thus defined remain valid until redefinition, ESC @, GS ＊, FS q execution, ESC ? deletion or power OFF is performed.

[Caution]	• Download characters and download bit images cannot be defined simultaneously.
	• Running this command clears the definition of the download bit image.
[Default]	Same as the internal character set.
[See Also]	ESC %, ESC ?

[Example]

Font A   Font B

Create each data bit by setting "1" for a printed dot and "0" for an unprinted dot.

[Sample Program]   Refer to Sample Program and Print Results for ESC % on page 23.

ESC ∗ m n1 n2 [d] k

[Function]	Specifying the bit image mode	
[Code]	<1B>H<2A>H<m><n1><n2> [<d>] k	
[Range]	m= 0, 1, 32, 33	
	$0 \leqq n1 \leqq 255$	
	$0 \leqq n2 \leqq 3$	
	$0 \leqq d \leqq 255$	
	$k = n1 + 256 \times n2$	(m = 0, 1)
	$k = (n1 + 256 \times n2) \times 3$	(m = 32, 33)

[Outline] According to the number of dots specified in "n1", "n2", specify the bit image of mode "m".

- The number of dots printed is divided by 256, whose quotient is taken as n2 and residual as "n1".

- The total number of dots printed in the horizontal direction is equal to $n1 + (256 \times n2)$.

- When bit image data have been input in excess of dot positions that can be printed on one line, the excess data are discarded.

- "d" is bit image data. Bits to be printed are specified as "1" and those not as "0".

- The bit image modes specified by m are shown as follows:

m	Mode	Vertical Direction		Horizontal Direction	
		No. of Dots	Dot Density	Dot Density	Max. No. of Dots
0	8-dots single density	8	67 DPI	101 DPI	288
1	8-dots double density	8	67 DPI	203 DPI	576
32	24-dots single density	24	203 DPI	101 DPI	288
33	24-dots double density	24	203 DPI	203 DPI	576

[Caution]
- When the value of m is out of the above range, the data following after n1 is processed as normal printing data.

- After completion of bit image printing, the printer returns to normal data processing mode.
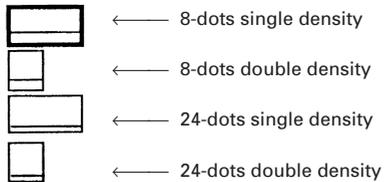
[Sample Program]

```
LPRINT CHR$(&H1B) + "＊";
LPRINT CHR$(0) + CHR$(20) + CHR$(0);        IMG1:
GOSUB IMG1                                      LPRINT CHR$(&HFF);
LPRINT CHR$(&HA);                               FOR I=1 TO 18
LPRINT CHR$(&H1B + "＊";                          LPRINT CHR$(&H85);
LPRINT CHR$(1) + CHR$(20) + CHR$(0);            NEXT I
GOSUB IMG1                                      LPRINT CHR$(&HFF);
LPRINT CHR$(&HA);                               RETURN
LPRINT CHR$(&H1B) + "＊";                    IMG2:
LPRINT CHR$(32) + CHR$(20) + CHR$(0);           LPRINT CHR$(&HFF);
GOSUB IMG2                                       LPRINT CHR$(&HFF);
LPRINT CHR$(&HA);                               LPRINT CHR$(&HFF);
LPRINT CHR$(&H1B) + "＊";                        FOR I=1 TO 18
LPRINT CHR$(33) + CHR$(20) + CHR$(0);             LPRINT CHR$(&H80);
GOSUB IMG2                                         LPRINT CHR$(&H00);
LPRINT CHR$(&HA);                                  LPRINT CHR$(&H05);
END                                             NEXT I
                                                LPRINT CHR$(&HFF);
                                                LPRINT CHR$(&HFF);
                                                LPRINT CHR$(&HFF);
                                                RETURN
```

[Print Results]

←—— 8-dots single density

←—— 8-dots double density

←—— 24-dots single density

←—— 24-dots double density

ESC – n

[Function]	Specifying/Canceling underline
[Code]	<1B>H<2D>H<n>
[Range]	0 ≦ n ≦ 2
	48 ≦ n ≦ 50
[Outline]	Specifying/canceling an underline.

n	Function
0.48	Canceling an underline
1.49	Specifying an underline for 1-dot width
2.50	Specifying an underline for 2-dots width

[Caution]	• An underline is attached to the full character width. It is, however, not attached to the part having been skipped by horizontal tab command.
	• An underline is not attached to a 90°- right-turned characters.
[Default]	n = 0
[See Also]	ESC !, FS -

[Sample Program]

```
LPRINT CHR$(&H1B) + "-" + CHR$(0);
LPRINT "AAAAA";
LPRINT CHR$(&H1B) + "-" + CHR$(1);
LPRINT "AAAAA" + CHR$(&HA);
END
```

[Print Results]

Underline Canceled

←——————→

A A A A A <u>A A A A A</u>

←——————→

Underline Specified

ESC 2

[Function]	Specifying 1/6-inch line feed rate
[Code]	<1B>H<32>H
[Outline]	The line feed rate per line is specified by 1/6 inch.
[Caution]	Line feed rate can be specified respectively for both STANDARD MODE and PAGE MODE.

[Sample Program]

```
LPRINT "AAAAA" + CHR$(&HA);
LPRINT CHR$(&H1B) + "3" + CHR$(0);
LPRINT "AAAAA" + CHR$(&HA);
LPRINT CHR$(&H1B) + "3" + CHR$(50);
LPRINT "AAAAA" + CHR$(&HA);
LPRINT CHR$(&H1B) + "2";
LPRINT "AAAAA" + CHR$(&HA);
LPRINT "AAAAA";
LPRINT CHR$(&H1B) + "J" + CHR$(100);
LPRINT "AAAAA" + CHR$(&HA);
LPRINT "AAAAA" + CHR$(&HA);
END
```

[Print Results]

```
A A A A A
              1/6-inch line feed

A A A A A
              0/203-inch line feed
A A A A A
              50/203-inch line feed

A A A A A
              1/6-inch line feed

A A A A A


              100 /203-inch line feed
A A A A A
              1/6-inch line feed
A A A A A
```

ESC 3 n

[Function]	Setting line feed rate of minimum pitch
[Code]	<1B>H<33>H<n>
[Range]	$0 \leqq n \leqq 255$
[Outline]	Sets the line feed width per line to [n × basic calculation pitch] inches.
[Caution]	The line feed width can be set separately for the STANDARD and PAGE MODES.
	The basic calculation pitch is set by GS P. Once defined, the line feed width is not changed if the basic calculation pitch is changed by GS P.
	Fractions resulting from calculation are corrected with the minimum pitch of the mechanism, and the remainder is omitted.
	• In STANDARD MODE, this command uses the vertical (Paper feed direction) basic calculation pitch (y).
	• In PAGE MODE, this command acts differently depending on the start point:
	(1) If the start point specified by ESC T is top left or bottom right, the command uses the vertical (Paper feed direction) basic calculation pitch (y).
	(2) If the start point specified by ESC T is top right or bottom left, the command uses the horizontal (Perpendicular to the paper feed direction) basic calculation pitch (x).
	The maximum settable line feed width is 1016 mm (40 inches). A setting greater than this maximum is trimmed to the maximum.
[Default]	Approx 4.23 mm
[See Also]	ESC 2, GS P

ESC = n

[Function]	Data input control
[Code]	<1B>H<3D>H<n>
[Range]	$0 \leqq n \leqq 255$
[Outline]	Selecting equipment for which data input from the host is valid.

• Each bit of "n" indicates as follows:

Bit	Equipment	Value	
		0	1
0	Printer	Invalid	Valid
1	Not defined		
2	Not defined		
3	Not defined		
4	Not defined		
5	Not defined		
6	Not defined		
7	Not defined		

• When the printer has not been selected, this printer abandons all the received data until it is selected by this command.

[Caution]	• Even when the printer has not been selected, it can become BUSY state through printer operation.
	• When the printer is deselected, this printer discards all the data until it is selected with this command. (Except DLE EOT, DLE ENQ, and DLE DC4)
[Default]	n = 1

ESC ? n

[Function]	Deleting download characters
[Code]	<1B>H<3F>H<n>
[Range]	32 ≦ n ≦ 126
[Outline]	Deletes the downloaded characters of specified code.
[Caution]	• The character "n" indicates the character code used to delete the defined pattern. After the deletion, characters are printed in the same pattern as the internal characters.
	• This command deletes the code-defined pattern of the character font selected by ESC !.
	• This command is ignored if the specified character code is undefined.
[See Also]	ESC &, ESC %

ESC @

[Function]	Initializing the printer
[Code]	<1B>H<40>H
[Outline]	Clears data stored in the print buffer and brings various settings to the initial state (Default state).
[Caution]	• The settings of DIP switches are not read again.
	• Data inside the internal input buffer is not cleared.
	• Macro definitions are not cleared.
	• NV bit image definitions are not cleared.

[Sample Program]

```
LPRINT CHR$(&H1B) + "!" + CHR$(&H30);
LPRINT CHR$(&H1B) + "V" + CHR$(1);
LPRINT "AAA" + CHR$(&HA);
LPRINT CHR$(&H1B) + "@";
LPRINT "AAA" + CHR$(&HA);
END
```

[Print Results]

A A A ⟵ Each setting has been
initialized by this command.

ESC D [n] k NUL

[Function]	Setting horizontal tab position
[Code]	<1B>H<44>H [<n>] k<00>
[Range]	$1 \leqq n \leqq 255$
	$0 \leqq k \leqq 32$
[Outline]	Specifying a horizontal tab position.

- "n" indicates the number of columns from the beginning to the horizontal tab position. Note, however, that "n= set position – 1". For example, to set the position at 9th column, n=8 is to be specified.
- "k" denotes the number of horizontal tab positions you want to set.
- The tab position is set at a position where it is "character width $\times$ n" from the beginning of a line. The character width, at this time, includes the space on the right. In double width characters, it is made double the ordinary case.
- Tab positions that can be specified are maximum 32. Specifying tab positions exceeding this limit is ignored.
- <n> k, which denotes a setting position, is input in the increasing order and ends at <00> H.
- ESC D <NUL> clears all the set tab positions. Following clearing, the horizontal tab command is ignored.

[Caution]	When the data, <n> k, is equal to or smaller than its preceding data, <n> k-1, it is assumed that tab setting is finished. If this is the case, the next data onward will be processed as normal data.
	When the data, <n> k, exceeds a 1-line print area, set the horizontal tab position, as "Set column position = Maximum print columns + 1". The horizontal tab position does not change even if the character width is altered after setting the horizontal tab position.
[Default]	• Tab positions are set at eight-character intervals (9th., 17th., 25th. columns) of Font A.
[See Also]	HT
[Sample Program]	Refer to Sample Program and Print Results for HT on page 6.

ESC E n

[Function]	Specifying/Canceling Emphasis Printing
[Code]	<1B>H<45>H<n>
[Range]	$0 \leqq n \leqq 255$
[Outline]	Specifying/canceling the emphasized characters.

• "n" is valid only for the lowest bit (n0).

• Control by the lowest bit (n0) is shown as follows:

n0	Function
0	Canceling emphasis printing
1	Specifying emphasis printing

• This is effective to all characters.

• Dot configuration of a emphasized character includes one extra dot added at its side.

• Emphasis printing can also be specified using ESC !, however, ESC E or ESC !, whichever command is processed last, takes precedence.

[See Also] ESC !

[Sample Program]

LPRINT CHR$(&H1B) + "E" + CHR$(0);
LPRINT "AAABBB" + CHR$(&HA);
LPRINT CHR$(&H1B) + "E" + CHR$(1);
LPRINT "AAABBB" + CHR$(&HA);
END

[Print Results]

A A A B B B ⟵—— Emphasis canceled

A A A B B B ⟵—— Emphasis specified

ESC　G　n

[Function]	Specifying/Canceling Double strike printing
[Code]	<1B>H<47>H<n>
[Range]	0 ≦ n ≦ 255
[Outline]	Specifying/canceling the double strike printing.
	• "n" is valid only for the lowest bit (n0).
	• Control by the lowest bit (n0) is shown as follows.

n0	Function
0	Canceling double strike printing
1	Specifying double strike printing

This is effective to all characters.

[Caution]	With this printer,double-strike printing and emphasis printing provide completely the same results.
[See Also]	ESC E
[Sample Program]	

```
LPRINT CHR$(&H1B) + "G" + CHR$(0);
LPRINT "AAABBB" + CHR$(&HA);
LPRINT CHR$(&H1B) + "G" + CHR$(1);
LPRINT "AAABBB" + CHR$(&HA);
END
```

[Print Results]

A A A B B B ⟵——— Double strike printing canceled

A A A B B B ⟵——— Double strike printing specified

ESC J n

[Function]	Printing and feeding paper in minimum pitch
[Code]	<1B>H<4A>H<n>
[Range]	$0 \leqq n \leqq 255$
[Outline]	Prints the data held in the print buffer and feeds paper by [n × basic calculation pitch] inches. The beginning of the line is taken as the next print start position.
[Caution]	The line feed width can be set separately for the STANDARD and PAGE MODES.

    • This command does not affect the line feed width defined by ESC 2 or ESC 3.

    • The basic calculation pitch is set by GS P.

    • Fractions resulting from calculation are corrected with the minimum pitch of the mechanism, and the remainder is omitted.

    • In STANDARD MODE, this command uses the vertical (Paper feed direction) basic calculation pitch (y).

    • In PAGE MODE, this command acts differently depending on the start point:

    (1) If the start point specified by ESC T is top left or bottom right, the command uses the vertical (Paper feed direction) basic calculation pitch (y).

    (2) If the start point specified by ESC T is top right or bottom left, the command uses the horizontal (Perpendicular to the paper feed direction) basic calculation pitch (x).

    The maximum settable line feed width is 1016 mm (40 inches). A setting greater than this maximum is trimmed to the maximum. The beginning of the line is taken as the next print start position.

[Default]	The initial value is not defined.
[Sample Program]	Refer to Sample Program and Print Results for ESC 2 on page 29.

ESC L

[Function]	Selecting PAGE MODE
[Code]	<1B>H<4C>H
[Outline]	Switches from STANDARD MODE to PAGE MODE.
[Caution]	• This command is only effective if it entered at the beginning of a line.
	• This command is not effective if it is entered when in PAGE MODE.
	• STANDARD MODE is restored when printing specified by FF is finished or when ESC S is issued.
	• The character mapping start position will be the point specified by ESC T in the print area specified by ESC W.
	• The commands listed below, which have separate settings for PAGE MODE and STANDARD MODE, are changed to the settings for PAGE MODE use.
	(1) Spacing setting:　　　ESC SP
	(2) Line feed width setting: ESC 2, ESC 3
	• The following commands are valid only in PAGE MODE.
	(1) ESC V　Specifying/canceling 90°-right-turned characters.
	(2) ESC a　Aligning the characters.
	(3) ESC {　Specifying/canceling the inverted characters.
	(4) GS L　Setting the left margin.
	(5) G3S W Setting the print area width.
	• ESC @ restores STANDARD MODE.
[See Also]	FF, CAN, ESC FF, ESC S, ESC T, ESC W, GS $, GS \

ESC M n

[Function]	Selection of character fonts
[Code]	<1B>H<4D>H<n>
[Definition value]	n=0, 1, 48, 49
[Outline]	Selects character fonts.

n	Function
0, 48	Selection of font A (12 × 24)
1, 49	Selection of font B (9 × 24)

[Details]	ESC ! can also select fonts, but the setting made by the command that has last been processed becomes valid.
[Reference]	ESC !

ESC R n

[Function]	Selecting the international character set
[Code]	<1B>H<52>H<n>
[Range]	0 ≦ n ≦ 10
[Outline]	Depending on the value of "n", one of the following character sets is specified;

n	Character Set
0	U.S.A.
1	France
2	Germany
3	U.K.
4	Denmark I
5	Sweden
6	Italy
7	Spain I
8	Japan
9	Norway
10	Denmark II
11	Spain II
12	Latin America
13	Korea

[Default]	n = 0
[See Also]	Character Code Table (International Character Set)

ESC S

[Function]	Selecting STANDARD MODE
[Code]	<1B>H<53>H
[Outline]	Switches from PAGE MODE to STANDARD MODE.
[Caution]	• This command is only effective if it is entered when in PAGE MODE.
	• Any data mapped in PAGE MODE is erased.
	• After this command is executed, the beginning of the line is taken as the next print start position.
	• The print area defined by ESC W is initialized.
	• The commands listed below, which have separate settings for STANDARD MODE and PAGE MODE, are changed to the settings for STANDARD MODE use.
	(1) Spacing setting:　　　　ESC SP
	(2) Line feed width setting:　ESC 2, ESC 3
	• STANDARD MODE is selected when the printer is turned on or reset,or when ESC @ is executed.
[See Also]	FF, ESC FF, ESC L

ESC T n

[Function]	Selecting the character printing direction in PAGE MODE
[Code]	<1B>H<54>H<n>
[Range]	$0 \leqq n \leqq 3$
	$48 \leqq n \leqq 51$
[Outline]	Selects the direction and start point of character printing in PAGE MODE.

n	Printing direction	Start point
0, 48	Left to right	Top left ("A" in the figure)
1, 49	Bottom to top	Bottom left ("B" in the figure)
2, 50	Right to left	Bottom right ("C" in the figure)
3, 51	Top to bottom	Top right ("D" in the figure)
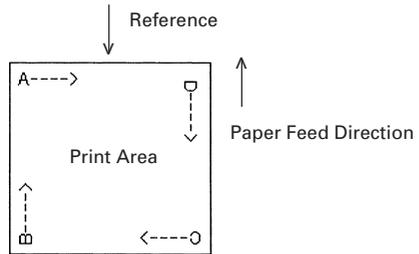
Reference

```
A---->              D
                    |
     Print Area     v      Paper Feed Direction
     ^
     |
     B        <----C
```

[Caution]
- When STANDARD MODE is selected, this command only executes the internal flagging of the printer without affecting the printing in STANDARD MODE.
- The character mapping position will be the start point of the print area specified by ESC W.
- The basic calculation pitch (x or y) used by the following commands varies with the start point.
  - (1) If the start point is the top left or bottom right (The characters are mapped in the direction perpendicular to the paper feed),
    - Commands using x: ESC SP, ESC S, ESC \
    - Commands using y: ESC 3, ESC J, GS $, GS \
  - (2) If the start point is the top right or bottom left (The characters are mapped in the paper feed direction),
    - Commands using x: ESC 3, ESC J, GS $, GS \
    - Commands using y: ESC SP, ESC S, ESC \

[Default]	n = 0
[See Also]	ESC $, ESC L, ESC W, ESC \, GS $, GS P, GS \

ESC V n

[Function]	Specifying/Canceling 90°-right-turned characters
[Code]	<1B>H<56>H<n>
[Range]	n = 0, 1, 48, 49
[Outline]	Specifying/canceling 90°-right- turned characters.

n	Function
0, 48	Canceling 90°-right- turned Characters
1, 49	Specifying 90°-right- turned Characters

[Caution]	No underlines are attached to 90°-right- turned characters .
[Default]	n = 0

[Sample Program]

LPRINT CHR$(&H1B) + "V" + CHR$(0);
LPRINT "AAAAA";
LPRINT CHR$(&H1B) + "V" + CHR$(1);
LPRINT "AAAAA" + CHR$(&HA);
END

[Print Results]

90° Rotation Canceled

⟵——————————⟶

A A A A A   ⊳ ⊳ ⊳ ⊳ ⊳

⟵——————————⟶

90° Rotation Specified

ESC W xL xH yL yH dxL dxH dyL dyH

[Function]	Defining the print area in PAGE MODE
[Code]	<1B>H<57>H<xL><xH><yL><yH><dxL><dxH><dyL><dyH>
[Range]	$0 \leqq$ xL, xH, yL, yH, dxL, dxH, dyL, dyH $\leqq 255$, except for dxL = dxH = 0 or dyL = dyH = 0
[Outline]	Defines the location and size of the print area.

- Horizontal start point = [(xL + xH $\times$ 256) $\times$ basic calculation pitch] inches
- Vertical start point = [(yL + yH $\times$ 256) $\times$ basic calculation pitch] inches
- Horizontal length = [(dxL + dxH $\times$ 256) $\times$ basic calculation pitch] inches
- Vertical length = [(dyL + dyH $\times$ 256) $\times$ basic calculation pitch] inches

[Caution]

- When STANDARD MODE is selected, this command only executes the internal flagging of the printer without affecting the printing in STANDARD MODE.

- If the horizontal start point or vertical start point is out of the printable area, this command is canceled and the next data is handled as normal data.

- If the horizontal length or vertical length is 0, this command is canceled and the next data is handled as normal data.

- The character mapping position will be the start point specified by ESC T in the print area.

- If the "horizontal start point + horizontal length" is greater than the horizontal printable area, the "horizontal printable area - horizontal start point" is taken as the horizontal length.

- If the "vertical start point + vertical length" is greater than the vertical printable area, the "vertical printable area - vertical start point" is taken as the vertical length.

- The basic calculation pitch is defined by GS P. Once defined, the print area is not changed if the basic calculation pitch is changed by GS P.

- Fractions resulting from calculations are corrected with the minimum pitch of the mechanism, and the remainder is omitted.

- The horizontal start point and horizontal length are calculated with the basic calculation pitch (x). The vertical start point and vertical length are calculated with the basic calculation pitch (y).

- The figure below illustrates the print area, where X = horizontal start point, Y=vertical start point, Dx=horizontal length, and Dy=vertical length.

```
┌─────────────────────────────────────┐
│ (X, Y)                     Paper     │   ↑
│   │                                  │   │
│   V        Dx                        │   │
│   ┌──────────────────────────┐       │   │
│ Dy│      Print Area           │       │  Paper Feed Direction
│   └──────────────────────────┘       │
│                        ∧             │
│            (X + Dx − 1 , Y + Dy − 1) │
└─────────────────────────────────────┘
```
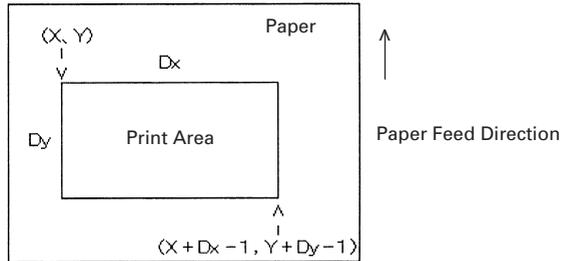
The printable area for this printer is approximately 72.070 mm (576/203 inches) horizontally and 117 mm (1662/360 inches) vertically.

[Default]　　xL=xH=yL=yH=0

dxL=64, dxH=2, dyL=126, dyH=6 (When 58mm wide paper is used: dxL=176, dxH=1)

[See Also]　　CAN, ESC L, ESC T, GS P

ESC \ nL nH

[Function]	Specifying the relative position
[Code]	<1B>H<5C>H<nL><nH>
[Range]	$0 \leqq nL \leqq 255$
	$0 \leqq nH \leqq 255$
[Outline]	This command specifies the next print start position in a relative position with respect to the current position. The next print start position will be at a point of [(nL + nH $\times$ 256) $\times$ basic calculation pitch] inches away from the current position.
[Caution]	• Specification of a position outside the print area is ignored.
	• If a new position is specified to the right of the current position in the direction of printing, it should be specified as positive (+). If it is to the left, it should be as negative(-).
	• A negative value is the complement of 65536. For example, to move the position by N pitches to the left, specify it as:
	nL + nH $\times$ 256 = 65536 - N
	• The basic calculation pitch is set by GS P.
	• Fractions resulting from calculation are corrected with the minimum pitch of the mechanism, and the remainder is omitted.
	• In STANDARD MODE, this command uses the horizontal basic calculation pitch (x).
	• In PAGE MODE, this command acts differently depending on the start point:
	(1) If the start point specified by ESC T is top left or bottom right, the command specifies the relative position in the direction perpendicular to the paper feed (The character's side-to-side direction), using the horizontal basic calculation pitch (x).
	(2) If the start point is top right or bottom left, the command specifies the relative position in the paper feed direction (The character's side-to-side direction), using the vertical basic calculation pitch (y).
[See Also]	ESC $, GS P
[Sample Program]	Refer to Sample Program and Print Results for ESC $ on page 21.

ESC a n

[Function]	Aligning the characters
[Code]	<1B>H<61>H<n>
[Range]	$0 \leqq n \leqq 2$
	$48 \leqq n \leqq 50$
[Outline]	All the printed data within one line are aligned in the specified position.

• Depending on the value "n", positional alignment is carried out as shown in the table below:

n	Position
0,48	Left end alignment
1,49	Centering
2,50	Right end alignment

[Caution]	• This command is valid only when it is inputted at the beginning of a line.
	• This command does not affect the PAGE MODE.
[Default]	n = 0

[Sample Program]

LPRINT CHR$(&H1B) + "a" + CHR$(0);
LPRINT "AAAAA" + CHR$(&HA);
LPRINT CHR$(&H1B) + "a" + CHR$(1);
LPRINT "AAAAA" + CHR$(&HA);
LPRINT CHR$(&H1B) + "a" + CHR$(2);
LPRINT "AAAAA" + CHR$(&HA);
END

[Print Results]

AAAAA

             AAAAA

                          AAAAA   Paper Feed

Left-justified   Centered   Right-justified   Direction

ESC c 3 n

[Function]	Selecting the Paper Sensor valid for a paper end signal output
[Code]	<1B>H<63>H<33>H<n>
[Range]	$0 \leqq n \leqq 255$
[Outline]	This command selects by which Paper Sensor a paper end signal should be output. Each bit for "n" has the following meaning:

Bit	Position	Value	
		0	1
0	Paper Near-end	Disabled	Enabled
1	Paper Near-end	Disabled	Enabled
2	Paper end	Disabled	Enabled
3	Paper end	Disabled	Enabled
4	Undefined		
5	Undefined		
6	Undefined		
7	Undefined		

[Caution]	This command is valid only for the parallel interface.
[Default]	n = 15

ESC c 4 n

[Function]	Selecting the Paper Near-end Sensor valid for print stop
[Code]	<1B>H<63>H<34>H<n>
[Range]	$0 \leqq n \leqq 255$
[Outline]	This command selects the Paper Near-end Sensor which helps to stop printing when the paper supply almost runs out.

Each bit for "n" has the following meaning:

Bit	Position	Value	
		0	1
0	Paper Near-end	Disabled	Enabled
1	Paper Near-end	Disabled	Enabled
2	Undefined		
3	Undefined		
4	Undefined		
5	Undefined		
6	Undefined		
7	Undefined		

This printer can only select one kind of Paper Sensor, a Paper Near-end Sensor.

[Default]	n = 0

ESC c 5 n

[Function]	Enabling/Disabling the panel switches
[Code]	<1B>H<63>H<35>H<n>
[Range]	0 ≦ n ≦ 255
[Outline]	Enabling/disabling the FEED switch.

• "n" is valid only in the lowest bit.

n0	Condition
0	FEED switch valid
1	FEED switch invalid

|	
[Caution]	When the panel switch is disabled with this command, the FEED switch is also disabled. Therefore, the paper cannot be fed by operating the FEED switch. Regardless of the setting of this command, the FEED switch is always enable while the switch is being waited for at the time of macro execution.
[Default]	n = 0

[Sample Program]

LPRINT CHR$(&H1B) + "c5" + CHR$(0); ← When enabling the FEED switch
LPRINT CHR$(&H1B) + "c5" + CHR$(1); ← When disabling the FEED switch

ESC d n

[Function]	Printing and feeding the paper by "n" lines
[Code]	<1B>H<64>H<n>
[Range]	0 ≦ n ≦ 255
[Outline]	Prints data in the print buffer and feeds paper by "n" lines.
	• Specified lines do not remain.
	• The beginning of the line is specified as the next print start position.
[Caution]	If [n × line feed width] exceeds approximately 1016 mm, this command feeds paper by approximately 1016 mm (40 inches).
[Default]	The initial value is not defined.

[Sample Program]

```
LPRINT "AAAAA";
LPRINT CHR$(&H1B) + "d" + CHR$(2);
LPRINT "AAAAA" + CHR$(&HA);
END
```

[Print Results]

AAAAA

2/6-inch line feed

AAAAA
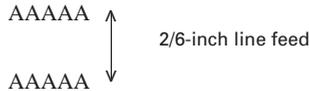
ESC p m n1 n2

[Function]	Generating the specified pulses
[Code]	<1B>H<70>H<m><n1><n2>
[Range]	m = 0, 1, 48, 49
	$0 \leqq n1 \leqq 255$
	$0 \leqq n2 \leqq 255$
[Outline]	The signals specified by "n1" and "n2" are output to the connector pin specified by "m".
	• "m" has the followings.

m	Connector Pin
0, 48	Drawer Kick-Out pin No.2
1, 49	Drawer Kick-Out pin No.5

	• The ON time is $n1 \times 2$ ms, and OFF time $n2 \times 2$ ms.
[Caution]	• When "m" is beyond a definition range, no signal is output, discarding "n1" and "n2".
	• The drawer drive duty must be within the following range:

$$\frac{\text{ON time}}{\text{ON time + OFF time}} \leqq 0.2$$

(The OFF time should be 4 times or more longer than the ON time.)

[Default]	The initial value for "m", "n1" and "n2" is not defined.
[Sample Program]	

```
LPRINT CHR$(&H1B) + "p";
LPRINT CHR$(0);    ←—— Selects pin No. 2.
LPRINT CHR$(5);    ←—— Sets ON time to 10ms
LPRINT CHR$(50);   ←—— Sets OFF time to 100ms
END
```

ESC t n

|	
[Function]	Selecting the character code table
[Code]	<1B>H<74>H<n>
[Range]	$0 \leqq n \leqq 9$, $16 \leqq n \leqq 19$, n = 255
[Outline]	Selecting the character code table:
	The character code table is selected based on the value of "n".

n	Character Code Table
0	Codepage PC437 (USA, European Standard)
1	Codepage Katakana (Japanese)
2, 19	Codepage PC858 (Multilingual)
3	Codepage PC860 (Portuguese)
4	Codepage PC863 (Canadian-French)
5	Codepage PC865 (Nordic)
6, 18	Codepage PC852 (Eastern Europe)
7, 17	Codepage PC866 (Russian)
8	Codepage PC857 (Turkish)
9, 16	Windows Codepage
255	Space Page(For user setting)

[Default]	This is a character code table specified with DIP Switch.
[Sample Program]	

```
LPRINT CHR$(&H1B) + "t" + CHR$(0);
LPRINT "n"=0;
FOR C=&HB2 TO &HB5
 LPRINT CHR$(C);
NEXT C
LPRINT CHR$(&HA);
LPRINT CHR$(&H1B) + "t" + CHR$(9);
LPRINT "n"=9;
FOR C=&HB2 TO &HB5
 LPRINT CHR$(C);
NEXT C
LPRINT CHR$(&HA);
END
```

[Print Results]

n = 0   ⬚ | ┤ ╡ ⟵ n = 0

n = 9   2 3 ′ μ ⟵ n = 9

— 53 —
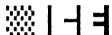
ESC { n

[Function]	Specifying/Canceling the inverted characters
[Code]	<1B>H<7B>H<n>
[Range]	0 ≦ n ≦ 255
[Outline]	Specifying/canceling inverted characters.

• "n" is valid only for the lowest bit (n0).

• Control by the lowest bit (n0) is shown as follows:

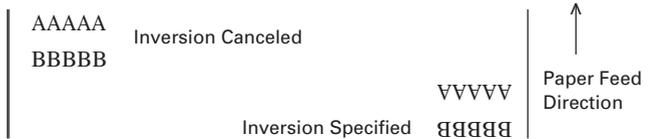| n0	Condition
0	Canceling inverted characters.
1	Specifying inverted characters.

[Caution]	• Inverted printing means printing the line turned 180°.
	• This command is valid only when it is specified at the beginning of a line.
	• This command does not affect the PAGE MODE.
[Default]	n = 0
[Sample Program]	LPRINT CHR$(&H1B) + "{" + CHR$(0);
	LPRINT "AAAAA" + CHR$(&HA);
	LPRINT "BBBBB" + CHR$(&HA);
	LPRINT CHR$(&H1B) + "{" + CHR$(1);
	LPRINT "AAAAA" + CHR$(&HA);
	LPRINT "BBBBB" + CHR$(&HA);
	END

[Print Results]

AAAAA   Inversion Canceled
BBBBB

ᗄᗄᗄᗄᗄ   Paper Feed
Inversion Specified   ᗺᗺᗺᗺᗺ   Direction

GS ! n

[Function]	Specifying the character size
[Code]	<1D>H<21>H<n>
[Range]	0 ≦ n ≦ 255, where:
	1 ≦ vertical magnification ≦ 8,
	1 ≦ horizontal magnification ≦ 8
[Outline]	Specifies the character size (Vertical and horizontal magnification).

Bit	Function	Value	
		Hex. Number	Decimal Number
0	Vertical magnification specification	Refer to Table 2, "Vertical Magnification".	
1			
2			
3			
4	Horizontal magnification specification	Refer to Table 1, "Horizontal Magnification".	
5			
6			
7			

Table 1 Horizontal Magnification

Hex.	Decimal	Magnification
00	0	1 ×(Standard)
10	16	2 ×(Double width)
20	32	3 ×
30	48	4 ×
40	64	5 ×
50	80	6 ×
60	96	7 ×
70	112	8 ×

Table 2 Vertical Magnification

Hex.	Decimal	Magnification
00	0	1 ×(Standard)
01	1	2 ×(Double height)
02	2	3 ×
03	3	4 ×
04	4	5 ×
05	5	6 ×
06	6	7 ×
07	7	8 ×

[Caution]	• This command works for all ANK characters except for HRI characters.
	• This command is ignored if either the vertical magnification or horizontal magnification is out of the defined range.
	• In STANDARD MODE, the vertical direction is defined as the paper feed direction, and the horizontal direction is defined as the direction perpendicular to the paper feed. These definitions are, therefore, interchanged when 90°-right-turned characters are specified.
	• In PAGE MODE, the vertical direction means the top-bottom direction of each character. The horizontal direction means the side-to-side direction of each character.

- If characters of different vertical magnification are contained in a line, the baseline of each character is lined up.
- Horizontal and vertical magnification can also be specified/canceled by ESC !.

  The ESC ! or GS ! command, whichever is handled last, becomes effective.

[Default] n = 0

[See Also] ESC !

GS $ nL nH

[Function]	Specifying the absolute vertical position of characters in PAGE MODE
[Code]	<1D>H<24>H<nL><nH>
[Range]	$0 \leqq nL \leqq 255$
	$0 \leqq nH \leqq 255$
[Outline]	This command is used in PAGE MODE to specify the vertical position of characters at the data mapping start position as an absolute value measured from the start point. The vertical position of a character at the next data mapping start position will be at a point [(nL + nH × 256) × basic calculation pitch] inches away from the start point.
[Caution]	• This command is ignored when PAGE MODE is not selected.
	• Any specification of absolute vertical position out of the print area is ignored.
	• The horizontal position of a character at the data mapping start position is not moved.
	• The start point used as the reference is specified by ESC T.
	• Depending on the start point specified by ESC T, this command acts as follows:
	(1) If the start point is the top left or bottom right, the command specifies the absolute position in the paper feed direction (The character's top-bottom direction), using the vertical basic calculation pitch (y).
	(2) If the start point is the top right or bottom left, the command specifies the absolute position in the direction perpendicular to the paper feed (The character's top-bottom direction) using the horizontal basic calculation pitch (x).
	• The basic calculation pitch is set by GS P.
	• Fractions resulting from calculations are corrected with the minimum pitch of the mechanism, and the remainder is omitted.
[See Also]	ESC $, ESC T, ESC W, ESC \, GS P, GS \

GS * n1 n2 [d] n1×n2×8

[Function]	Defining the download bit image
[Code]	<1D>H<2A>H<n1><n2> [< d >] n1 × n2 × 8
[Range]	$1 \leqq n1 \leqq 255$
	$1 \leqq n2 \leqq 48$
	$n1 \times n2 \leqq 1536$
	$0 \leqq d \leqq 255$
[Outline]	Defines download bit images of the number of dots specified by n1 and n2.
	• The numbers of dots are $n1 \times 8$ in horizontal direction and $n2 \times 8$ in vertical direction.
	• "d" indicates bit image data.
	• Once defined, the download bit image remains effective until redefinition, ESC @ execution, ESC &, or power OFF takes place.
[Caution]	• Relations between the bit image data and the dots defined are shown below.
	• A download character and a download bit image cannot be defined simultaneously.
	With this command executed, the defined content of a downloaded character is cleared.
[See Also]	GS /
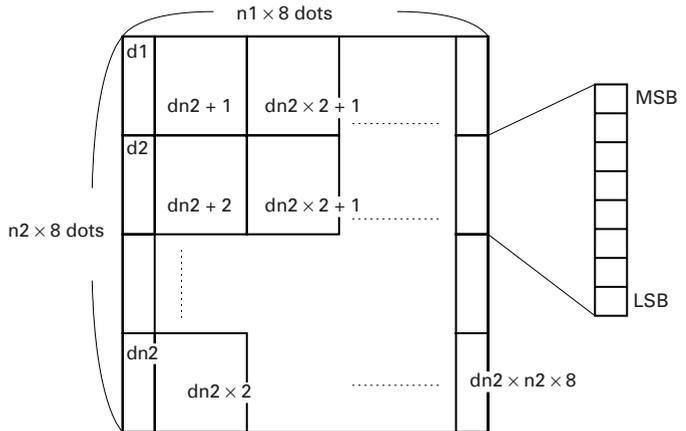
[Sample Program]

```
GOSUB IMG
LPRINT CHR$(&H1D) + "/" + CHR$(0);
LPRINT CHR$(&H1D) + "/" + CHR$(1);
LPRINT CHR$(&H1D) + "/" + CHR$(2);
LPRINT CHR$(&H1D) + "/" + CHR$(3);
END
IMG:
n1=10 : n2=5
LPRINT CHR$(&H1D) + "＊";
LPRINT CHR$(n1) + CHR$(n2);
FOR J=1 TO n1＊8
  FOR I=1 TO n2
    LPRINT CHR$(J);
  NEXT I
NEXT J
RETURN
```

[Print Results]

←——— NORMAL MODE

←——— DOUBLE WIDTH MODE

←——— DOUBLE HEIGHT MODE

←——— QUADRUPLE MODE

GS (A pL pH n m

[Function]	Execution of test printing
[Code]	<1D>H<28>H<41>H<pL><pH><n><m>
[Definition]	$(pL+(pH \times 256))=2$ (pL=2, pH=0)
	$0 \leqq n \leqq 2$, $48 \leqq n \leqq 50$
	$1 \leqq m \leqq 3$, $49 \leqq m \leqq 51$
[Outline]	Specified test printing will be executed.

• pL, pH will specify the number of subsequent parameters by $(pL+(pH \times 256))$bytes.

• n will specify the paper for test printing in the following table.

n	Category of paper
0, 48	Basic paper (Paper rolls)
1, 49 2, 50	Paper rolls

• m will specify the category of test printing in the following table.

m	Category of test printing
1, 49	Hexadecimal dump
2, 50	Printer's status printing
3, 51	Rolling pattern printing

[Details]

• This command is only valid when processed at the head of a line during the STANDARD MODE.

• The command will be ignored in PAGE MODE.

• During macro definition, if this command is processed, the macro definition is suspended, and the command starts being processed.

• Printer will reset its hard disk after finishing test printing. Therefore, the printer makes download characters, bit map images and macros undefined, clears the reception buffer/print buffer, and returns the various settings to defaults. At this time, the DIP switches are read again.

• Paper cutting is performed at the end of test printing.

• Printer will be BUSY when the processing of the command starts.

GS / m

[Function]	Printing the downloaded bit image
[Code]	<1D>H<2F>H<m>
[Range]	0 ≦ m ≦ 3
	48 ≦ m ≦ 51
[Outline]	Prints downloaded bit image in a mode specified by "m".
	Modes that can be selected by "m" are shown below.

m	Mode Name	Dot Density in Vertical Direction	Dot Density in Horizontal Direction
0,48	NORMAL MODE	203 DPI	203 DPI
1,49	DOUBLE WIDTH MODE	203 DPI	101 DPI
2,50	DOUBLE HEIGHT MODE	101 DPI	203 DPI
3,51	QUADRUPLE SIZE MODE	101 DPI	101 DPI

[Caution]
- When data exist in the print buffer, this command is ignored.
- When a downloaded bit image has not been defined, this command is ignored.
- A portion of a downloaded bit image exceeding one line length is not printed.
- A downloaded character and a downloaded bit image cannot be defined simultaneously.
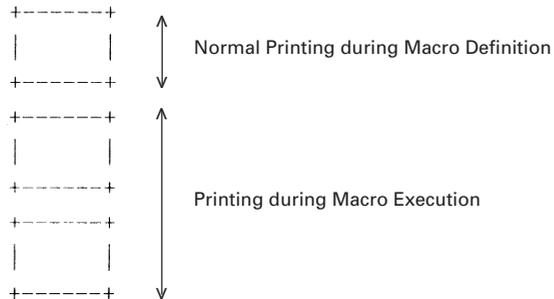
[See Also] GS *

GS :

[Function]	Starting/Ending macro definition
[Code]	<1D>H<3A>H
[Outline]	Specifying starting/ending macro definition.
	Reception of this command during macro definition signifies ending the macro definition.
[Caution]	Maximum content available for macro definition is 2048 bytes. A portion exceeding 2048 bytes is not defined.
	• Even with ESC @ (Initialization of the printer) having been executed, defined content is not cleared. Therefore, it is possible to include ESC @ into the content of macro definition.
	• Normal printing operation is carried out even during macro definition.
[Default]	The initial value is not defined.
[See Also]	GS ^

[Sample Program]

```
LPRINT CHR$(&H1D) + ":";
LPRINT "+———+" + CHR$(&HA);
LPRINT "|        |" + CHR$(&HA);
LPRINT "+———+" + CHR$(&HA);
LPRINT CHR$(&H1D) + ":";
LPRINT CHR$(&H1D) + "^";
LPRINT CHR$(2) + CHR$(10);
END
```

[Print Results]

```
+------+    ↑
|      |    |    Normal Printing during Macro Definition
+------+    ↓

+------+    ↑
|      |    |
+------+    |
+------+    |    Printing during Macro Execution
|      |    |
+------+    ↓
```

GS B n

[Function]	Specifying/Canceling the black/white inverted printing
[Code]	<1D>H<42>H<n>
[Range]	$0 \leqq n \leqq 255$
[Outline]	This command specifies or cancels the black/white inverted printing.

• "n" is valid only for the lowest bit (n0).

• Control by the lowest bit (n0) is shown as follows:

n0	Function
0	The black/white inverted printing is canceled.
1	The black/white inverted printing is specified.

[Caution]
• Number "n" is only valid in the lowest bit.

• The black/white inversion works on internal and downloaded characters.

• The black/white inversion works also on the right spacing of characters defined by ESC SP.

• This command does not affect the bit image, downloaded bit image, bar code, HRI characters, or the skip area specified by HT, ESC $, or ESC \.

• This command does not affect the space between lines.

• Black/white inversion specification takes precedence over underline specification. Underline printing specified is, therefore, nullified if black/white inversion is specified; the underline setting, however, remains unchanged.

[Default]   n = 0

GS H n

[Function]	Selecting of printing position of HRI characters
[Code]	<1D>H<48>H<n>
[Range]	0 ≦ n ≦ 3
	48 ≦ n ≦ 51
[Outline]	Selecting printing position of HRI characters in printing bar codes.

• "n" means the followings.

n	Printing Position
0,48	No printing
1,49	Above the bar code
2,50	Below the bar code
3,51	Both above and below the bar code

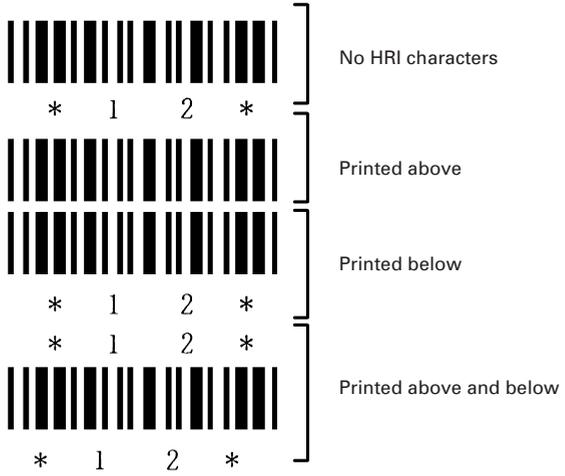|	
[Caution]	• The HRI characters refer to the bar code-turned characters so that you can read them.
	• The HRI characters are printed in the font selected with GS f.
	• Specify before the GS k command.
[Default]	n = 0
[See Also]	GS f, GS k

[Sample Program]

```
LPRINT CHR$(&H1B) + "3" + CHR$(5);
LPRINT CHR$(&H1D) + "h" + CHR$(50);
LPRINT CHR$(&H1D) + "H" + CHR$(0);
GOSUB BC
LPRINT CHR$(&H1D) + "H" + CHR$(1);
GOSUB BC
LPRINT CHR$(&H1D) + "H" + CHR$(2);
GOSUB BC
LPRINT CHR$(&H1D) + "H" + CHR$(3);
GOSUB BC
END
BC:
LPRINT CHR$(&H1D) + "k";
LPRINT CHR$(4);
LPRINT "12" + CHR$(0);
LPRINT CHR$(&HA);
RETURN
```

[Print Results]

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
∗　1　　2　　∗

No HRI characters

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖

Printed above

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
∗　1　　2　　∗

Printed below

∗　1　　2　　∗
‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
∗　1　　2　　∗

Printed above and below

GS I n

[Function]	Sending the printer ID	
[Code]	<1D>H<49>H<n>	
[Range]	1 ≦ n ≦ 4 , 49 ≦ n ≦ 52	
[Outline]	Sends the specified printer ID.	

n	Type of printer ID	Specification	Value (Hex.)
1,49	Model ID	CBM1000	30
2,50	Type ID	Refer to table "Type ID" below	
3,51	ROM version ID	As per ROM version	
4,52	Label Length	Depends on label sheet (mm)	

Type ID If n=2, 50 is specified:

| Bit	Meaning	Hex.	Decimal
0	Equipped for 2 byte code support	01	1
1	Equipped with autocutter	02	2
2	Thermosensitive paper Label	—	—
	Label paper(when "Label" is selected)	—	—
3	Undefined	—	—
4	Unused	00	0
5	Undefined	—	—
6	Undefined	—	—
7	Unused	00	0

n = 4, 52 specified (only for label specs)
The label length and label gap currently used are returned in 4-byte code.
All fractional parts in millimeters are rounded off.
Byte 1 + Byte 2 x 256 = Label length (between black mark paper)①
Byte 3 + Byte 4 x 256 = Label gap (black mark paper length)②

Label Paper   Black Mark Paper
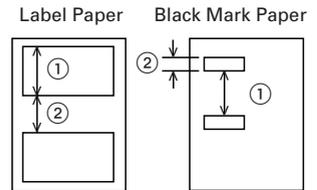
[Caution]

• Under DTR/DSR control, the printer sends the printer ID after verifying that the host is ready to receive. If the host is not ready to receive, the printer waits for the host to become ready to receive.

• Under XON/XOFF control, the printer sends the printer ID without checking whether the host is ready to receive or busy.

• Because this command is executed when data is mapped in the receive buffer, there may be a delay between command receiving and printer ID sending depending on the condition of the receive buffer.

• If ASB (Automatic Status Back) is enabled by GS a, the host must discriminate between the printer ID due to this command and the status due to ASB.

GS L nL nH

[Function]	Setting the left margin
[Code]	<1D>H<4C>H<nL><nH>
[Range]	$0 \leqq nL \leqq 255$
	$0 \leqq nH \leqq 255$
[Outline]	This command sets the left margin specified by nL and nH. The value of the left margin is [(nL + nH $\times$ 256) $\times$ basic calculation pitch] inches.
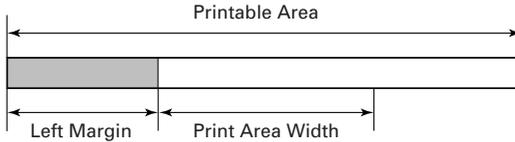
Printable Area

Left Margin   Print Area Width

[Caution]
- This command only works when it is entered at the beginning of a line.
- When PAGE MODE is selected, this command only executes the internal flagging of the printer.
- The setting of this command does not affect PAGE MODE.
- The maximum settable left margin is equal to the horizontal printable area. A setting greater than this maximum is trimmed to the maximum.
- The basic calculation pitch is defined by GS P. Once defined, the left margin is not changed if the basic calculation pitch is changed by GS P.
- The left margin is calculated with the horizontal basic calculation pitch (x) set by GS P. A fraction resulting from the calculation is corrected with the minimum pitch of the mechanism, and the remainder is omitted.
- When mapping character data, if the print area specified is not wide enough to accommodate one character of the current font, only the line for that character data is handled as follows:
  (1) The print area is extended toward the right to be equivalent to one character of the current font, but not wider than the printable area.
  (2) If an area for one character cannot be provided as a result of step (1), the print area is extended toward the left. (So, the left margin is decreased.)

• When mapping non-character data (Bit image, downloaded bit image, or bar code), if the print area specified is narrower than 9-bits, only the line for that data is handled as follows:

(1) The print area is extended toward the left (So, the left margin is decreased) until it is 9-dot wide, but not wider than the printable area.

[Default] $nL = 0$, $nH = 0$

[See Also]   GS P, GS W

GS P x y

[Function]	Specifying the basic calculation pitch
[Code]	<1D>H<50>H<x><y>
[Range]	$0 \leqq x \leqq 255$
	$0 \leqq y \leqq 255$
[Outline]	This command sets the horizontal basic calculation pitch to approx. 25.4/x mm (1/x inches), and the vertical basic calculation pitch to approx. 25.4/y mm (1/y inches).

• If x = 0, the horizontal basic calculation pitch is reverted to the default value.

• If y = 0, the vertical basic calculation pitch is reverted to the default value.

[Caution]

• The horizontal direction is defined as the direction perpendicular to the paper feed, and the vertical direction is defined as the paper feed direction.

• In STANDARD MODE, the following parameters are used regardless of the character orientation (e.g. inverted or 90°-right-turned).

(1) Commands using x: ESC SP, ESC $, ESC \, GS L, GS W

(2) Commands using y: ESC 3, ESC J

• In PAGE MODE, the parameters used depend on the character orientation, as follows:

(1) If the start point specified by ESC T is the top left or bottom right (The characters are mapped in the direction perpendicular to the paper feed):

• Commands using x: ESC SP, ESC $, ESC W, ESC \

• Commands using y: ESC 3, ESC J, ESC W, GS $,GS \

(2) If the start point specified by ESC T is the top right or bottom left (The characters are mapped in the paper feed direction):

• Commands using x: ESC 3, ESC J, ESC W, GS $,GS \

• Commands using y: ESC SP, ESC $, ESC W, ESC \

• This command does not affect any other values that are already set.

• If calculations made in combination with another command generate fractions, the fractions are corrected with the minimum pitch of the mechanism, and the remainder is omitted.

[Default]	x = 203, y = 360
[See Also]	ESC SP, ESC $, ESC 3, ESC J, ESC W, ESC \, GS $, GS L, GS W, GS \

GS V m .... (1)

GS V m n ..... (2)

[Function]	Cutting the paper
[Code]	(1) <1D>H<56>H<m>
	(2) <1D>H<56>H<m><n>
[Range]	(1) m = 1, m = 49
	(2) m = 66
	$0 \leqq n \leqq 255$
[Outline]	Performs the specified paper cutting.

m	Function
1,49	Partial cut (Leaving a bridge area uncut)
66	Paper feed by "cut position + {n × basic calculation pitch}"and partial cut (Leaving a bridge area uncut)

[Caution]

• Fully cut for the label sheet specs.

• In STANDARD MODE, this command only works when it is entered at the beginning of a line.

For (1):

• A partial cut (Leaving a bridge area uncut) is executed.

For (2):

• If n = 0, the paper is fed to the cut position, and then cut. If n ≠ 0, the paper is fed by "n × basic calculation pitch" inches past the cut position, and then cut.

• The basic calculation pitch is set by GS P.

The paper feed amount is calculated with the vertical basic calculation pitch (y).

A fraction resulting from the calculation is corrected with the minimum pitch of the mechanism, and the remainder is omitted.

⚠ CAUTION:

When using label sheet:
• Be sure to cut the base sheet at every label gap. Otherwise, the cutter performance will be immensely degraded.
• Never open the printer cover while printing as proper print operation may not be guaranteed. Opening the printer cover may alter label length setting or other parameters.
• Never use label rolls with different label sizes or label gaps as proper print operation will not be guaranteed.

GS W nL nH

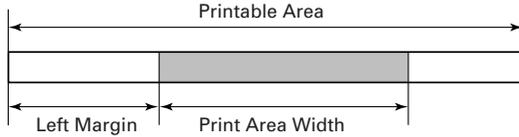|	
[Function]	Setting the print area width
[Code]	<1D>H<57>H<nL><nH>
[Range]	$0 \leqq nL \leqq 255$
	$0 \leqq nH \leqq 255$
[Outline]	Sets the print area width specified by nL and nH.

• The print area width will be [(nL + nH $\times$ 256) $\times$ basic calculation pitch] inches.

Printable Area

Left Margin   Print Area Width

[Caution]

• This command only works when it is entered at the beginning of a line.

• When PAGE MODE is selected, this command only executes the internal flagging of the printer.

• The setting of this command does not affect PAGE MODE.

• If the value entered with this command exceeds the printable area for one line, the entire area except the left margin is set as the print area width.

• The basic calculation pitches are defined by GS P. Once defined, the print area width is not changed if the basic calculation pitch is changed by GS P.

• The print area width is calculated with the horizontal basic calculation pitch (x) defined by GS P. A fraction resulting from the calculation is corrected with the minimum pitch of the mechanism, and the remainder is omitted.

• If the first character to be mapped at the beginning of a line has a width (Including the right spacing) greater than the print area width, only that line is handled as follows:

(1) The print area is extended toward the right to accommodate the first character, but not wider than the printable area.

Printable Area

A

Left Margin   Extended toward the right

Print Area Width
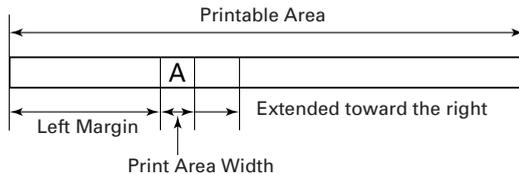
(2) If a sufficient area cannot be provided as a result of step (1), the print area is extended toward the left (So, the left margin is decreased).
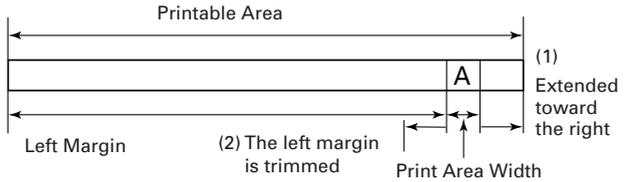
(3) If a sufficient area cannot be provided as a result of step (2), the right spacing is trimmed.

• When mapping a bit image (Or downloaded bit image), if the print area is narrower than the minimum width of the bit image (Two dots for single density, or one dot for double density), only the line for that image is handled as follows:

(1) The print area is extended toward the left (So, the left margin is decreased) until it is equal to the minimum width of the image, but not wider than the printable area.

[Default]   nL=64, nH=2 (When 58mm wide paper is used: nL=176, nH=1)

Since the default value varies depending on the number of columns, refer to "Defing the print area in PAGE MODE; ESC W"on page 44, for more information.

[See Also]   GS L, GS P

GS \ nL nH

[Function]	Specifying the relative vertical position of a character in PAGE MODE
[Code]	<1D>H<5C>H<nL><nH>
[Range]	$0 \leqq nL \leqq 255$
	$0 \leqq nH \leqq 255$
[Outline]	This command is used in PAGE MODE to specify the vertical position of a character in the data mapping start position, in a relative position with respect to the current position. The next data mapping start position will be at a point $[(nL + nH \times 256) \times$ basic calculation pitch] inches away from the current position.
[Caution]	• This command is ignored when PAGE MODE is not selected.
	• If a new position is specified for a character located beneath the current position, it should be specified as positive (+). If it is above the current position, it should be negative (-).
	• A negative value is the complement of 65536. For example, to move the position by N pitches up, specify it as:
	$nL + nH \times 256 = 65536 - N$
	• The specification of a relative position outside the specified print area is ignored.
	• Depending on the start point specified by ESC T, this command acts as follows:
	(1) If the start point is the top left or bottom right, the command specifies the relative position in the paper feed direction (The character's top-bottom direction) using the vertical basic calculation pitch (y).
	(2) If the start point is the top right or bottom left, the command specifies the relative position in the direction perpendicular to the paper feed (The character's top-bottom direction) using the horizontal basic calculation pitch (x).
	• The basic calculation pitch is set by GS P.
	• Fractions resulting from calculations are corrected with the minimum pitch of the mechanism, and the remainder is omitted.

GS ^ n1 n2 n3

[Function]	Executing the macro
[Code]	<1D>H<5E>H<n1><n2><n3>
[Range]	0 ≦ n1 ≦ 255
	0 ≦ n2 ≦ 255
	0 ≦ n3 ≦ 1
[Outline]	Executing contents defined in macro.

    n1 : The number of times of macro execution

    n2 : Waiting time on macro execution

        Waiting time of $n2 \times 100$ msec is given for every execution.

    n3 : Macro execution mode

        n3=0 Continuous execution:

          The Macro is executed "n1" times continuously at the time interval specified by "n2".

        n3=1 Execution by FEED Switch:

          After waiting for the time specified by "n2", the ARARM LED flickers and the FEED switch is waiting to be pressed. When it is pressed, the macro is executed once. This action is repeated "n1" times.

[Caution]	• When this command is received while in macro definition, suspension of macro definition is indicated. At this time, the defined content is cleared.
	• No execution takes place when the macro is held undefined or n1=0.
	• While in macro execution with n3=1, paper feed with the FEED switch is not available.
[Default]	The initial value is not defined.
[See Also]	GS :
[Sample Program]	Refer to Sample Program and Print Results for GS: on page 62.

GS a n

[Function]	Enabling/Disabling ASB (Automatic Status Back)
[Code]	<1D>H<61>H<n>
[Range]	0 ≦ n ≦ 255
[Outline]	This command selects the status item to be addressed by ASB (Automatic Status Back.)

Bit	Status item addressed by ASB	Hex.	Decimal
0	Status of pin 3 of Drawer Kick-Out Connector = disabled	00	0
	Status of pin 3 of Drawer Kick-Out Connector = enabled	01	1
1	Online/offline status = disabled	00	0
	Online/offline status = enabled	02	2
2	Error status = disabled	00	0
	Error status = enabled	04	4
3	Continuous Paper Sensor = disabled	00	0
	Continuous Paper Sensor = enabled	08	8
4	Undefined	—	—
5	Undefined	—	—
6	Undefined	—	—
7	Undefined	—	—

[Caution]

- If any status item is enabled, the status is sent to the host when this command is executed. After that time on, the status is sent each time an enabled status item changes. Because each status item represents the current condition, status items disabled for ASB may also have changed.

- The ASB function is disabled if all status items are disabled.

- If the ASB function is enabled by default, the host receives the status the first time the printer gets ready for communication after it is turned on.

- The printer sends 4 bytes of status shown in the tables below, without checking whether the host is ready to receive or busy. The 4 bytes of status is a continuous string except for XOFF code.

- Because this command is executed when data is mapped in the receive buffer, there may be a delay between command receiving and status sending depending on the condition of the receive buffer.

- Even if the printer is excluded from the selection of peripheral equipment (ESC =), the 4 bytes of status is sent to the host whenever status changes.

- When DLE EOT, GS I, or GS r is used, the host must discriminate between the status specified by these commands and the status due to ASB.

(1) 1st byte (Printer information)

Bit	Status	Hex.	Decimal
0	Unused	00	0
1	Unused	00	0
2	Status of pin 3 of Drawer Kick-Out Connector = "L"	00	0
2	Status of pin 3 of Drawer Kick-Out Connector = "H"	04	4
3	Online status	00	0
3	Offline status	08	8
4	Unused	10	16
5	Cover closed	00	0
5	Cover open	20	32
6	Not in paper feed state triggered by FEED switch	00	0
6	In paper feed state triggered by FEED switch	40	64
7	Unused	00	0

(2) 2nd byte (Error occurrence information)

Bit	Status	Hex.	Decimal
0	Undefined	—	—
1	Undefined	—	—
2	No label detection error occurred (only when "Label" is selected).	00	0
2	A label detection error occurred (only when "Label" is selected).	04	4
3	Auto cutter error not occurred	00	0
3	Auto cutter error occurred	08	8
4	Unused	00	0
5	Unrecoverable error not occurred	00	0
5	Unrecoverable error occurred	20	32
6	Auto recovery error not occurred	00	0
6	Auto recovery error occurred	40	64
7	Unused	00	0

(3) 3rd byte (Paper Sensor information)

Bit	Status	Hex.	Decimal
0,1	Paper found by Paper Near-end Sensor	00	0
0,1	Paper not found by Paper Near-end Sensor	03	3
2,3	Paper found by Paper end Sensor	00	0
2,3	Paper not found by Paper end Sensor	0C	12
4	Unused	00	0
5	Undefined	—	—
6	Undefined	—	—
7	Unused	00	0

(4) 4th byte (Paper Sensor information)

Bit	Status	Hex	Decimal
0	Undefined	—	—
1	Undefined	—	—
2	Undefined	—	—
3	Undefined	—	—
4	Unused	00	0
5	Undefined	—	—
6	Undefined	—	—
7	Unused	00	0

[Default]   DIP Switch 2-6 OFF: n = 0

DIP Switch 2-6 ON: n = 2

[See Also]   DLE EOT, GS r

GS b n

[Function]	Specifying/Canceling the smoothing
[Code]	<1D>H<62>H<n>
[Range]	0 ≦ n ≦ 255
[Outline]	This command specifies or cancels the smoothing.

• "n" is valid only for the lowest bit (n0).

• Control by the lowest bit (n0) is shown as follows:

n0	Function
0	The smoothing is canceled.
1	The smoothing is specified.

[Caution]
• Smoothing is effective to printer's internal characters, download characters, and non-standard characters.
• Smoothing is not effective to characters with either of their vertical or horizontal magnification is x1.

[Default]   n = 0

[See Also]   ESC !, GS !

GS f n

[Function]	Selecting the font of HRI characters
[Code]	<1D>H<66>H<n>
[Range]	n = 0, 1
[Outline]	Selecting the font of HRI characters in printing bar code.
	The type of font can be selected with "n" as follows:

n	Font
0, 48	Font A (12 × 24)
1, 49	Font B (9 × 24)

The HRI characters refer to the bar code-turned characters so that you can read them.

[Caution]	The HRI characters are printed at the position specified with GS H.
[Default]	n = 0
[See Also]	GS H

[Sample Program]

```
LPRINT CHR$(&H1D) + "h" + CHR$(50);
LPRINT CHR$(&H1D) + "H" + CHR$(2);
LPRINT CHR$(&H1D) + "f" + CHR$(0);
GOSUB BC
LPRINT CHR$(&H1D) + "f" + CHR$(1);
GOSUB BC
END
BC:
LPRINT CHR$(&H1D) + "k";
LPRINT CHR$(4);
LPRINT "12" + CHR$(0);
LPRINT CHR$(&HA);
RETURN
```

[Print Results]

←—— FONT A

←—— FONT B
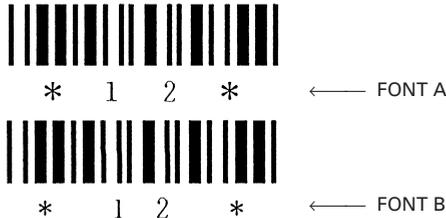
GS h n

[Function]	Specifying the height of the bar code
[Code]	<1D>H<68>H<n>
[Range]	1 ≦ n ≦ 255
[Outline]	Selecting bar code height.
	"n" denotes the number of dots in the vertical direction.
[Default]	n = 162
[Sample Program]	Refer to Sample Program and Print Results for GS w on page 93.

GS k m [d1 ..... dk] NUL
GS k m n [d1 ...... dn]

[Function]	Printing the bar code	
[Code]	(1) <1D>H<6B>H<m> [d1.....dk] NUL	
	(2) <1D>H<6B>H<m><n> [d1....dn]	
[Range]	(1) 0 ≦ m ≦ 6	The definitions of "k" and "d" vary with the bar code system.
	(2) 65 ≦ m ≦ 73	The definitions of "n" and "d" vary with the bar code system.

[Outline] Selects a bar code system and prints the bar code.

For (1):

m	Bar code system	Range of "n"	Range of "d"
0	UPC-A	11 ≦ k ≦ 12	48 ≦ d ≦ 57
1	UPC-E	11 ≦ k ≦ 12	48 ≦ d ≦ 57
2	JAN13 (EAN)	12 ≦ k ≦ 13	48 ≦ d ≦ 57
3	JAN8 (EAN)	7 ≦ k ≦ 8	48 ≦ d ≦ 57
4	CODE39	1 ≦ k	48 ≦ d ≦ 57, 65 ≦ d ≦ 90 32, 36, 37, 43, 45, 46, 47
5	ITF	1 ≦ k (Must be an even number)	48 ≦ d ≦ 57
6	CODABAR	1 ≦ k	48 ≦ d ≦ 57, 65 ≦ d ≦ 68 36, 43, 45, 46, 47, 58

For (2):

m	Bar code system	Range of "n"	Range of "d"
65	UPC-A	11 ≦ n ≦ 12	48 ≦ d ≦ 57
66	UPC-E	11 ≦ n ≦ 12	48 ≦ d ≦ 57
67	JAN13 (EAN)	12 ≦ n ≦ 13	48 ≦ d ≦ 57
68	JAN8 (EAN)	7 ≦ n ≦ 8	48 ≦ d ≦ 57
69	CODE39	1 ≦ n ≦ 255	48 ≦ d ≦ 57, 65 ≦ d ≦ 90 32, 36, 37, 43, 45, 46, 47
70	ITF	1 ≦ n ≦ 255 (An even number)	48 ≦ d ≦ 57
71	CODABAR	1 ≦ n ≦ 255	48 ≦ d ≦ 57, 65 ≦ d ≦ 68 36, 43, 45, 46, 47, 58
72	CODE93	1 ≦ n ≦ 255	0 ≦ d ≦ 127
73	CODE128	2 ≦ n ≦ 255	0 ≦ d ≦ 127

[Caution]	**For (1):**

For (1):

- This command ends with a NUL code.

- For UPC-A or UPC-E, the bar code is printed when 12 bytes of bar code data have been entered, and the subsequent data is handled as normal data.

- For JAN13, the bar code is printed when 13 bytes of bar code data have been entered, and the subsequent data is handled as normal data.

- For JAN8, the bar code is printed when 8 bytes of bar code data have been entered, and the subsequent data is handled as normal data.

- The data of ITF bar code must have an even number of columns. Should the data have an odd number of columns, the last column is ignored.

For (2):

- Numeral "n" indicates the number of data items, and the subsequent "n" bytes of data are handled as bar code data.

- If "n" is out of the range, the processing of the command is aborted, and the subsequent data is handled as normal data.

For STANDARD MODE:

- If "d" is out of the range, only a paper feed is executed, and the subsequent data is handled as normal data.

- If the bar code is wider than the print area for one line, the bar code is not printed, but only a paper feed is executed.

- The amount of paper feed corresponds to the height of the bar code (Including the HRI characters if HRI character printing is specified), irrespective of the line feed width set by a command such as ESC 2 or ESC 3.

- This command only works if no data exists in the print buffer. If any data exists in the print buffer, the data subsequent to "m" is handled as normal data.

- After the bar code is printed, the beginning of the line is taken as the start position for the next print.

- This command is not affected by any print modes (Emphasis, double strike, underline, and character size), except for the inverted character mode.

For PAGE MODE:

• This command only maps the bar code, without performing a printout. After the bar code is mapped, the dot next to the last data item of the bar code is taken as the start position for the next data mapping.

• If "d" is out of the range, the processing of the command is aborted, and the subsequent data is handled as normal data. In this case, the data mapping start position does not move.

• If the bar code is wider than the print area, the bar code is not printed, but the data mapping start position is moved to the left end of the non-print area.

[Default]   The initial value is not defined.

[Description of Bar Codes]

UPC-A   This bar code, consisting of numerals only, has a fixed length of 12 columns; a 11-column number entered from the host or application software plus a check digit (12th column) automatically calculated inside the printer. If the 12th-column numeral is sent from the host, the entire bar code will be printed as it is.

UPC-E   This bar code, consisting of numerals only, has a fixed length of 8 columns; the first number system character is "0" stationary. A 12-column numeral entered from the host or application software is compressed to 8 columns with a check digit attached and then is printed. The 12th-column check digit is automatically calculated inside the printer. If it is and sent from the host, the entire bar code will be printed, compressed to 8 columns.

JAN-13(EAN) This bar code, consisting of numerals only, has a fixed length of 13 columns; a 12-column number entered from the host or application software plus a check digit (13th column) automatically calculated inside the printer. If the 13th-column numeral is sent from the host, the entire bar code will be printed as it is.

JAN-8(EAN) This bar code, consisting of numerals only, has a fixed length of 8 columns; a 7-column number entered from the host or application software plus a check digit (8th column) automatically calculated inside the printer. If the 8th-column numeral is sent from the host, the entire bar code will be printed as it is.

CODE39   This bar code, consisting of upper-case alphabetic characters and numerals, has a variable length of columns. The start/stop code "∗" is automatically added by the printer. The available characters include space and "$ % + – · / 0 1 2 3 4 5 6 7 8 9" and upper-case alphabetic characters.

ITF   This bar code, consisting of only numerals, has a variable length of even-number columns. If a code of odd-number columns is sent, the bar code will not be printed.

CODABAR (NW-7)

> This bar code, consisting of alphanumerics, has a variable length of columns. Available characters include "0 1 2 3 4 5 6 7 8 9 A B C D $ + − . / : ". A start/stop code is required; any one of A, B, C, and D is used.

CODE93
> This bar code, consisting of alphanumeric and control characters, has a variable length of columns. The HRI character string is preceded and followed by a "■" character. HRI characters for control characters (00H - 1FH, and 7FH) are each printed as a combination of a "■" character and an alphabetic character.

Control character		HRI character	Control character		HRI character
ASCII	Hex.		ASCII	Hex.	
NUL	00	■ U	DLE	10	■ P
SOH	01	■ A	DC1	11	■ Q
STX	02	■ B	DC2	12	■ R
ETX	03	■ C	DC3	13	■ S
EOT	04	■ D	DC4	14	■ T
ENQ	05	■ E	NAK	15	■ U
ACK	06	■ F	SYN	16	■ V
BEL	07	■ G	ETB	17	■ W
BS	08	■ H	CAN	18	■ X
HT	09	■ I	EM	19	■ Y
LF	0A	■ J	SUB	1A	■ Z
VT	0B	■ K	ESC	1B	■ A
FF	0C	■ L	FS	1C	■ B
CR	0D	■ M	GS	1D	■ C
SO	0E	■ N	RS	1E	■ D
SI	0F	■ 0	US	1F	■ E
			DEL	7F	■ T

CODE128   This bar code consists of 103 bar code characters and three code sets, enabling 128 ASCII code characters to be printed. It has a variable length of columns.

- Code set A ASCII characters 00H - 5FH can be represented.
- Code set B ASCII characters 20H - 7FH can be represented.
- Code set C Two-digit numbers 00 - 99 can each be represented by one character.

In addition to the above characters, special characters are available:

- Shift character (SHIFT)

When used in code set A, one character next to a Shift character is treated as a character of code set B. When used in code set B, one character next to a Shift character is treated as a character of code set A. The Shift character cannot be used in code set C.

- Code set select characters (CODE A, CODE B, CODE C):

The code set following a code set select character is switched to code set A, B, or C.

- Function characters (FNC1, FNC2, FNC3, FNC4):

How the function characters are used depends on each application. In code set C, only FNC1 is available.

When sending print data, note these points:

(1) Each string of bar code data must begin with a code set select character (CODE A, CODE B, or CODE C), which selects the first code set to use.

(2) Every special character is specified by a combination of two characters: a brace "{" followed by one character. A brace "{" itself is sent twice consecutively.

Special characters

Hex.	ASCII	Code set A	Code set B	Code set C
7B53	{ S	SHIFT	SHIFT	–N/A
7B41	{ A	–N/A	CODE A	CODE A
7B42	{ B	CODE B	–N/A	CODE B
7B43	{ C	CODE C	CODE C	–N/A
7B31	{ 1	FNC1	FNC1	FNC1
7B32	{ 2	FNC2	FNC2	–N/A
7B33	{ 3	FNC3	FNC3	–N/A
7B34	{ 4	FNC4	FNC4	–N/A
7B7B	{ {	' { '	' { '	' { '

<Example>

To print "No." in code set B, followed by "123456" in code set C, send the following data string:

GS k <73><10><7Bh 42h> "No." <7Bh 43h><12><34><56>

- If the printer finds a string of bar code data that does not begin with a code set select character, it immediately aborts the command processing and handles the subsequent data as normal data.

- If the printer received a character that is not available in the currently selected code set, it immediately aborts the command processing and handles the subsequent data as normal data.

- An HRI character corresponding to either a Shift character or a code select character is not printed. An HRI character for either a function character or a control character is treated as a space character.

[Sample Program]

```
LPRINT CHR$(&H1D) + "H" + CHR$(2);
LPRINT CHR$(&H1D) + "k";
LPRINT CHR$(4);
LPRINT "123" + CHR$(0);
END
```

[Print Results]
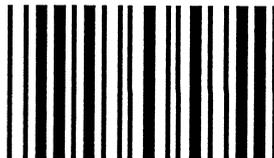
When the data "123" is printed with the code 39

[Description of Bar Codes]

UPC-A, UPC-E, JAN-13 (EAN), JAN-8 (EAN), CODE39, ITF, CODABAR, CODE93, CODE128

Type	Print Sample	Outline of Symbol
UPC-A	123456 789012	12-column fixed-length bar code consisting of numerals only.
UPC-E	123643	8-column fixed-length bar code consisting of numerals only. Abbreviated version of UPC-A.
JAN-13	1234567 890128	13-column fixed-length bar code consisting of numerals only.
JAN-8	1234 5670	8-column fixed-length bar code consisting of numerals only.
CODE39	＊ 1 2 3 4 5 ＊	Variable-length bar code consisting of alphabetic characters and numerals. The start/stop code "＊"is automatically added.
ITF	1234567890	Even-column variable-length bar code consisting of numerals only.
CODABAR (NW-7)	A 1 2 3 4 5 6 A	Variable-length bar code consisting of alphanumeric characters. Any one of A, B, C, and D is required as the start/stop code.
CODE93	□Code■M931234567890 1□	Variable-length bar code consisting of alphanumeric and control characters.
CODE128	ABCD12345	Variable-length bar code consisting of any of 128 ASCII code characters.

Printing is done according to bar code type, number of print columns, bar code height, width (Magnification), availability of HRI character, and bar code data.

GS p n   (Only for Label Model)

[Function]	Selecting the paper mode
[Code]	<1D>H<70>H<n>
[Range]	n = 0, 1
[Outline]	Selecting the paper mode.

The mode can be selected with "n" as follows:

n	Function
0	Standard thermal paper
1	Label paper (Label interval detection or Black mark detection)

[Caution]   When "n" is "1", it is set to the detection mode of DIP switch 2-8.

This command only works when it is entered at the beginning of a line.

[Default]   DIP switch 2-7 OFF: n = 0

DIP switch 2-7 ON: n = 1

GS r n

[Function]	Sending status
[Code]	<1D>H<72>H<n>
[Range]	$1 \leqq n \leqq 2$
	$49 \leqq n \leqq 50$
[Outline]	Sends the specified status to the host.

n	Function
1,49	Sends the paper Sensor status.
2,50	Sends the Drawer Kick-out Connector status.

[Caution]

• When the serial interface is used:

    For DTR/DSR control:

      The printer sends the status after verifying that the host is ready to receive. If the host is not ready to receive, the printer waits for the host to become ready to receive.

    For XON/XOFF control:

      The printer sends the status without checking whether the host is ready to receive or busy.

• Because this command is executed when data is mapped in the receive buffer, there may be a delay between receiving the command and sending the status depending on the condition of the receive buffer.

• If ASB (Automatic Status Back) is enabled by GS a, the host must discriminate between the status due to this command and the status due to ASB.

• Paper Sensor status (n = 1, 49)

Bit	Status	Hex.	Decimal
0,1	Paper found by Paper Near-end Sensor	00	0
	Paper not found by Paper Near-end Sensor	03	3
2,3	Paper found by Paper end Sensor	00	0
	Paper not found by Paper end Sensor	(0C)	(12)
4	Unused	00	0
5	Undefined	—	—
6	Undefined	—	—
7	Unused	00	0

Bits 2, 3: Whenever the Paper end Sensor detects a "paper out" state, the printer goes offline, and the command is not executed. The printer, therefore, never sends a status where bit 2 = "1" or bit 3 = "1".

• Drawer Kick-Out Connector status (n = 2, 50)

Bit	Status	Hex.	Decimal
0	Status of pin 3 of Drawer Kick Connector = "L"	00	0
	Status of pin 3 of Drawer Kick Connector = "H"	01	1
1	Undefined	—	—
2	Undefined	—	—
3	Undefined	—	—
4	Unused	00	0
5	Undefined	—	—
6	Undefined	—	—
7	Unused	00	0

[See Also]　　　　DLE EOT, GS a

GS v 0 m xL xH yL yH d1…dk

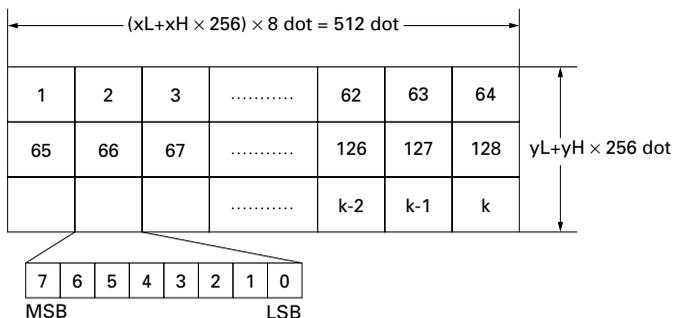|	
[Function]	Printing of raster bit image
[Code]	<1D>H<76>H<30>H<m><xL><xH><yL><yH> [<d>] k
[Range]	$0 \leqq m \leqq 3$, $48 \leqq m \leqq 51$, $0 \leqq xL \leqq 255$, $0 \leqq xH \leqq 255$,
	$0 \leqq yL \leqq 255$, $0 \leqq yH \leqq 8$, $0 \leqq d \leqq 255$,
	$k = (xL + xH \times 256) \times (yL + yH \times 256)$, however, $k \neq 0$
[Outline]	Prints raster bit images in mode "m".

m	Mode Name	Dot Density in Vertical Direction	Dot Density in Horizontal Direction
0,48	NORMAL MODE	203 DPI	203 DPI
1,49	DOUBLE WIDTH MODE	203 DPI	101 DPI
2,50	DOUBLE HEIGHT MODE	101 DPI	203 DPI
3,51	QUADRUPLE SIZE MODE	101 DPI	101 DPI

- xL, xH specify the number of data in horizontal direction of the bit image to $(xL + xH \times 256)$ bytes.
- yL, yH specify the number of data in vertical direction of the bit image to $(yL + yH \times 256)$ bytes.

[Details]
- In STANDARD MODE, this command is valid only when there is no print data in the print buffer.
- Any of the print modes (Character size, emphasis, double strike, inverting, underlining, back-to-white reversing, etc.) does not affect the raster bit image.
- If the print area specified by GS L and GS W is narrower than a minimum width, the print area for that line only is extended to the minimum width. The minimum width is one dot in NORMAL MODE (m=0, 48) and DOUBLE HEIGHT MODE (m=2, 50), and 2 dot in DOUBLE WIDTH MODE (m=1, 49) and QUADRUPLE SIZE MODE (m=3, 51).
- Any part of data that is out of the print area is only read and discarded in units of dot.
- The print start position can arbitrarily be specified with HT (Horizontal tab), ESC $ (Specifying absolute position), ESC \ (Specifying relative positions), and GS L (Setting left margins). Note that if the print start position is not a multiple of 8, the printing speed may decrease.
- The setting of ESC a (Aligning characters) are also valid for the raster bit image.

- If this command is executed during macro definition, the macro definition is suspended, and the processing of the command starts. The macro is left undefined.
- "d" denotes defined data. Dots to be printed are specified as "1", and those not to be printed as "0".

[Example]

When xL+xH $\times$ 256= 64

1	2	3	………	62	63	64
65	66	67	………	126	127	128
			………	k-2	k-1	k

(xL+xH $\times$ 256) $\times$ 8 dot = 512 dot

yL+yH $\times$ 256 dot

7	6	5	4	3	2	1	0

MSB   LSB

GS w n

[Function]	Specifying the horizontal size (Magnification) of bar code
[Code]	<1D>H<77>H<n>
[Range]	$2 \leqq n \leqq 6$
[Outline]	Selecting bar code width.
	"n" denotes the number of dots in fine element width.
[Default]	n = 3

[Sample Program]

```
LPRINT CHR$(&H1D) + "h" + CHR$(30);
LPRINT CHR$(&H1D) + "w" + CHR$(2);
GOSUB BC
LPRINT CHR$(&H1D) + "h" + CHR$(50);
LPRINT CHR$(&H1D) + "w" + CHR$(3);
GOSUB BC
LPRINT CHR$(&H1D) + "h" + CHR$(80);
LPRINT CHR$(&H1D) + "w" + CHR$(4);
GOSUB BC
END
BC:
LPRINT CHR$(&H1D) + "k";
LPRINT CHR$(4);
LPRINT "12" + CHR$(0);
RETURN
```

[Print Results]

←——— Height = 30, Magnification = 2

←——— Height = 50, Magnification = 3

←——— Height = 80, Magnification = 4
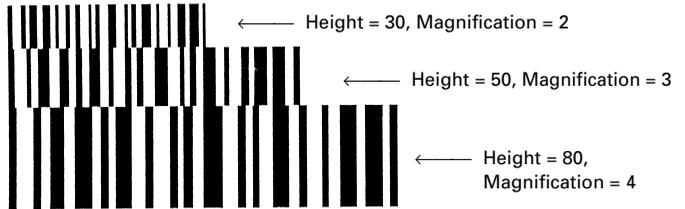
FS g3 m a1 a2 a3 a4 nL nH d1…dk

[Function]	Writing data into the download user NV memory
[Code]	<1C>H<67>H<33>H<m>H<a1>H<a2>H<a3>H<a4>H
	<nL>H<nH>H[<d>]nL+(nH × 256)
[Range]	m=0
	6000H ≦ (a1+(a2 × 256)+(a3 × 65536)+(a4 × 16777216)) ≦ 7FFFH
	Sto rage start address ≦ (nL+(nH × 256)) ≦ 1024
	k=(nL+(nH × 256))
[Outline]	This command loads data into the download user NV memory.
	• "m" is fixed at 0.
	• a1, a2, a3, a4 set the data storage start address at (a1+(a2 × 256)+(a3 × 65536)+(a4 × 16777216)).
	• nL, nH sets the number of stored data to (nL+(nH × 256)) bytes.
	• "d" denotes the data to be stored.
[Details]	• The download user NV memory refers to a storage area exclusively for character data secured on non-volatile memory.
	Font A: Start address 6000H End address 71FFH (36 bytes for 1 character)
	Font B: Start address 7200H End address 7F7FH (27 bytes for 1 character)
	• When the STANDARD MODE is selected, this command is valid only when it is written at the head of the line.
	• This command is invalid when PAGE MODE is selected.
	• If this command is sent while a macro is being defined, the definition process will be stopped and the execution of this command will start.
	• If the argument (m), the storage start address (a1, a2, a3, a4), or the number of stored data (nL, nH) is outside the definition area, this command becomes invalid and the following data will be processed as normal data.
	• Date storage processing causes "overwriting" to be executed, thus erasing the data stored already before the storage processing was executed.
	• When an error occurs during the writing process, the error will be a "Memory or gate-array R/W error".
	• Data in the user NV memory can be read by using the FS g4 command.
	• Data in the user NV memory is not initialized by using the ESC @ command, the FS q command or by resetting the printer or turning the power off.

[Caution] • Because frequent writing in the non-volatile memory can destroy the memory, the writing command (FS g3) should be used less than 10 times a day.

• It may happen that the printer becomes BUSY during the process of writing data into the non-volatile memory while this command is executed. When the printer becomes BUSY, it will stop receiving data. Therefore, sending data from the host (Including real time commands) is prohibited.

[Reference] FS g4

FS g4 m a1 a2 a3 a4 nL nH

[Function]	Reading data from the download user NV memory
[Code]	<1C>H<67>H<34>H<m>H<a1>H<a2>H<a3>H<a4>H <nL>H<nH>H
[Range]	m=0 6000H $\leqq$ (a1+(a2 × 256)+(a3 × 65536)+(a4 × 16777216)) $\leqq$ 7FFFH Write start address +n1+nH × 256 $\leqq$ 8000H K=(nL+(nH × 256))
[Outline]	• This command reads data from the download user NV memory. • "m" is fixed at 0. • a1, a2, a3, a4 set the data sending start address at (a1+(a2 × 256)+(a3 × 65536)+(a4 × 16777216)). • nL, nH set the number of sent data to (nL+(nH × 256)) bytes.

[Details]	• The download user NV memory refers to a storage area exclusively for character data secured on non-volatile memory.
	  Font A: Start address 6000H End address 71FFH (36 bytes for 1 character)
	  Font B: Start address 7200H End address 7F7FH (27 bytes for 1 character)
	• If the argument (m), the send start address (a1, a2, a3, a4), or the number of sent data (nL, nH) is outside the definition area, this command becomes invalid and the following data will be processed as normal data.
	• When the preparation for sending data is completed, the following processes are executed.
	  1) The printer state will change from READY to BUSY. If the printer state is already set to BUSY, the printer will do nothing.
	  2) (Header + data + NUL) is sent.
	  3) The printer state will change from BUSY to READY. At this moment, if the printer state is set to BUSY because of other reasons, it remains in the BUSY state.
	  The construction of (Header + data + NUL) is as follows.
	  Header: 5FH in hexadecimal = 95 in decimal (1 byte)
	  Data: data in download user NV memory ((nL+nH × 256) bytes)
	• When the DTR/DSR control is selected, all codes are sent continuously after verifying that the host can receive the data to be sent. If the host cannot receive the data, it will wait until it can be received.

- When the XON/XOFF control is selected, all the codes are sent continuously without verifying that the host can receive the data. Data that has been sent is always continuous except for the XOFF code.
- When parallel interface is used, the size of the buffer for sending data (The buffer that stores all data to be sent except for ASB status) is 99 bytes. Data which exceeds 99 bytes, will be discarded.
- Data can be written into the download user NV memory using the FS g3 command.
- There may be a delay between receiving this command and storing the data depending on the state of the receiving buffer.

[Caution]
- After the header is sent, all data will be sent without verifying whether the host can receive the data or not. Therefore, the available space in the receiving buffer of the host should be more than (The number of sent data+2) in order not to lose data during the execution of this command.
- While data is being sent, real time commands (Commands with a DLE extension) will be ignored. And even if the ASB function is validly selected, ASB status will not be sent while data is in the process of being sent. Therefore, it is not possible to check the change in the printer state by checking its status. The user must pay attention to this.

[Reference] FS g3

F S p n m

[Function]	Printing the download NV bit images
[Code]	<1C>H<70>H<n><m>
[Range]	1 ≦ n ≦ 255
	0 ≦ m ≦ 3
	48 ≦ m ≦ 51
[Outline]	This command prints the download NV bit images (n) using a specified mode (m).

m	Mode Name	Dot Density in Vertical Direction	Dot Density in Horizontal Direction
0,48	NORMAL MODE	203 DPI	203 DPI
1,49	DOUBLE WIDTH MODE	203 DPI	101 DPI
2,50	DOUBLE HEIGHT MODE	101 DPI	203 DPI
3,51	QUADRUPLE SIZE MODE	101 DPI	101 DPI

• "n" denotes the number of the download bit image.

• "m" denotes the bit image mode.

[Details]

• The download NV bit image refers to the image that is defined by the FS q command in the non-volatile memory and printed by the FS p command.

• When the specified NV bit image "n" is undefined, this command is invalid.

• When the STANDARD MODE is selected, this command is valid only when there is no data in the print buffer.

• This command is invalid when PAGE MODE is selected.

• Any printing modes except the upside-down printing mode (i.e. emphasis, double strike, underlining, character size, inverted character printing, 90° - right-turned) are not affected.

• When the printing area set by the functions GS L and GS W is not enough for one vertical line of the download NV bit image, the line alone is dealt with as follows. One vertical line of the bit image is 1dot in NORMAL MODE (m = 0, 48) and DOUBLE HEIGHT MODE (m = 2, 50), and it is 2 dots in double WIDTH MODE (m = 1, 49) and QUADRUPLE SIZE MODE. (m = 3, 51)

1) The printing area is extended to the right side within the limits of the printing area so that one vertical line of the download NV bit image can be printed.

2) When a sufficient printing area cannot be maintained even after executing (1), the printing area is extended to the left side. (The left margin is reduced.)

- When the size of a bit image exceeds the limits of the printing area, the data within the limits of the printing area will be printed but the parts exceeding the limit will not be printed.
- Regardless of the amount of line feed set with ESC 2 and ESC 3, NORMAL MODE and DOUBLE WIDTH MODE execute a paper feed of (Height n of NV bit image) dots while DOUBLE HEIGHT MODE and QUADRUPLE SIZE MODE execute a paper feed of (Height n of NV bit image $\times$ 2) dots.
- At the completion of the bit image printing, the head of the line will be used for the next printing position and normal data processing will take place.

[Related Commands] ESC $*$, FS q, GS / , GS v 0

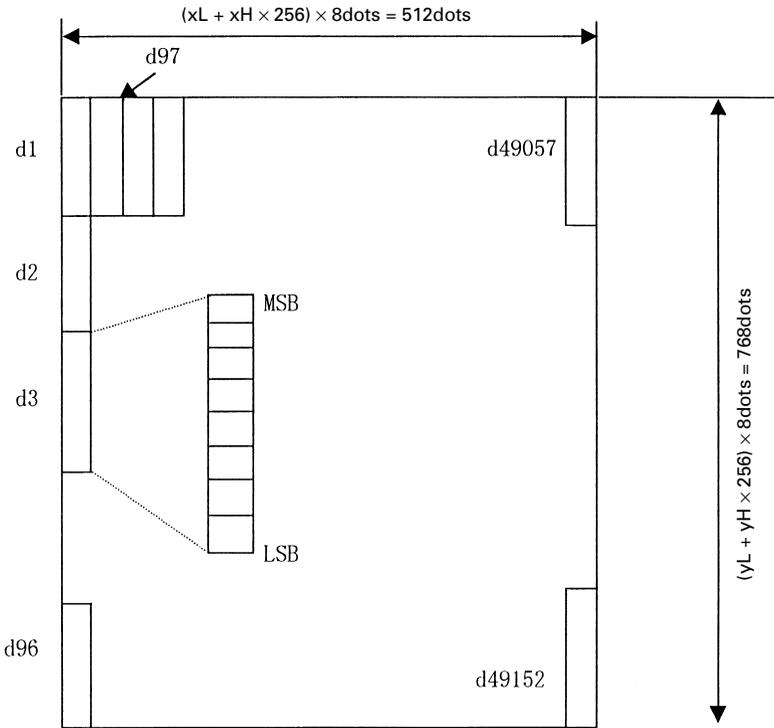## F S q n [xL xH yL yH d1…dk] 1… [xL xH yL yH d1…dk] n

[Function]	Defining the download NV bit image
[Code]	<1C>H<71>H<n>H{<xL><xH><yL><yH><d1...dk>}1...
	{<xL><xH><yL><yH><d1...dk>}n
[Range]	$1 \leqq n \leqq 255$, $0 \leqq xL \leqq 255$,
	$0 \leqq xH \leqq 3$ but, $1 \leqq (xL + xH \times 256) \leqq 1023$
	$0 \leqq yL \leqq 255$
	$0 \leqq yH \leqq 1$ but, $1 \leqq (yL + yH \times 256) \leqq 288$
	$0 \leqq d \leqq 255$
	$k = (xL + xH \times 256) \times (yL + yH \times 256) \times 8$
	Total definition area = 2M bit (256K bytes)
[Outline]	This command defines the specified NV bit image.
	• "n" denotes the number of bit images to be defined.
	• xL and xH denote the horizontal size of one NV bit image as $(xL + xH \times 256) \times 8$ dots.
	• yL and yH denote the vertical size of one NV bit image as $(yL + yH \times 256) \times 8$ dots.
[Details]	• Because all the NV bit images previously defined by this command are deleted, it is not possible to redefine any one of the previously defined multiple data. All the data must be resent.
	• From the execution of this command until the completion of the hardware reset, any mechanical operation such as opening the cover, initializing the printer head position, or using the paper-feed switch etc.
	• The NV bit image refers to a bit image that is defined by the FS q command in the non-volatile memory and printed by the FS p command.
	• When the STANDARD MODE is selected, this command is only valid when it is written at the head of a line.
	• This command is invalid when PAGE MODE is selected.
	• This command becomes valid after the 7 bytes of <FS – yH> are processed as normal values.
	• When data which exceeds the remaining capacity of the defined area is specified by xL, xH, yL, yH, outside-defined-area arguments will be processed.
	• When outside-defined-area arguments are processed for the first bit image data group, this command becomes invalid.

- If outside-defined-area arguments are processed for the second or subsequent NV bit image data groups, the processing of this command is suspended, and a writing process into the non-volatile memory starts. At this time, the NV bit image being defined becomes invalid (Undefined), but the preceding NV bit images are valid.

- "d" denotes the definition data. Bits which correspond to dots to be printed are represented as 1, and those not to be printed as 0.

- The definition will start from NV bit image number 01H and n-number bit images will be defined in ascending order. Therefore, the first data group [xL xH yL yH d1… dk] becomes NV bit image number 01H, and the last data group [xL xH yL yH d1… dk] becomes NV bit image number 0nH. These numbers of NV bit images coincide with those specified with FS p.

- The definition data of one NV bit image consists of [xL xH yL yH d1… dk]. Therefore, when only one NV bit image is defined, n=1; the data group [xL xH yL yH d1… dk] is manipulated once, and ([Data: $(xL + xH \times 256) \times (yL + yH \times 256) \times 8$] + [header: 4]) bytes of non-volatile memory is used to store it.

- The maximum definition area of this printer is 2M bit (256K byte). Multiple NV bit images can be defined, but bit images of which total size (Bit image data + header) exceeds 2M bit(256K byte) can not be defined.

- The printer state will change to BUSY just before the writing operation into the non-volatile memory begins. Also,for a printer that have a dip switch[BUSY], the printer state will change to BUSY just before the writing operation begins regardless of the state of the dip switch.

- While this command is being executed, it is not possible to send ASB status or to detect the printer status even when the ASB function is selected.

- If this command is sent while a macro is still being defined, the definition process will be stopped and the execution of this command will start.

- NV bit images that are defined already are not initialized by using ESC @ command, or by resetting the printer or turning the power off.

- The command only executes definition of NV bit image, but not start printing. The printing of NV bit image will be executed by FS p.

[Caution]
- Because frequent writing in the non-volatile memory can destroy the memory, the writing command should be used less than 10 times a day.
- Just after the completion of the writing operation into the non-volatile memory, the printer hardware will be reset. Therefore, download characters, download bit images, and macro definition will be made undefined. The receiving buffer/printer buffer will be cleared, and each setting will go back to its default value. Then the status of dip switches will be checked once more.
- It may happen that the printer becomes BUSY during the process of writing data into the non-volatile memory in the execution of this command. When the printer becomes BUSY, it will stop receiving data. Therefore, sending data from the host (Including real time command) is prohibited.

[Related Commands] FS p

$(xL + xH \times 256) \times 8dots = 512dots$

d97

d1

d49057

d2

MSB

d3

LSB

$(yL + yH \times 256) \times 8dots = 768dots$

d96

d49152

[Example]   When xL =64, xH = 0, yL = 96, yH = 0

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GS FF

[Function]	Printing and discharging the label.
[Code]	<1DH><0C>H
[Outline]	This command prints the data in the printer buffer and cuts discharged the label
[Caution]	Valid only if "Label" is chosen for paper type.
	Operation depends on the selection mechanism:
	No auto cutter:
	• The label is advanced to the manual cutter.
	• The LED flashes, indicating that the printer is ready for manual cutting and subsequent FEED switch operations.
	• When the FEED switch is pressed, the next label is advanced to the print position.
	With auto cutter:
	• The printed label is advanced to the auto cutter position, where it is completely cut off.
	• The next label is advanced to the print position.
[See Also]	FF, GS <

GS <

[Function]	Initializing the printer mechanism
[Code]	<1D>H<3C>H
[Outline]	Perform a label initialization identical to power-on initialization.
[Caution]	This command is valid only if "label" is chosen.
	• Parameters configured by commands are not reset.

GS A m n

[Function]	Correcting the label top position
[Code]	<1DH><41>H<m><n>
[Range]	$0 \leqq m \leqq 255$
	$0 \leqq n \leqq 255$
[Outline]	This command sets the label head position in terms of correction value the default position.
	• m denotes the correctingdirection and valid only for the least
	• significant bit(m0).

m0	Correcting direction
0	Corrects in the forward direction
1	Corrects in the reverse direction

[Caution]	• This command is valid only if "label" is chosen.
	• This command is ignored immediately after the execution of a leader positioning command (FF, GS FF, GS A, GS <) or immediately after leader positioning performed on a paper feed action with the FEED switch, power on, or cover closure.
	• The maximum reverse correction span is 0.5 mm. Correction settings exceeding this value are truncated into the maximum value. The label may be mispositioned due to paper flexure. For reverse correction, exercise care so the leader position does not step out of the label.
	• For forward correction, set the correction span by taking into account the label length as the printable area changes before and after correction setting.
	• In calculating a correction span, use the calculated basic feed span for the vertical direction. The fractional part contained in the calculation result should be used for correction at an increment of the mechanism's minimum feed span, with the remaining fractional part truncated.
[See Also]	FF, GS FF

GS C0 m n

[Function]	Setting the numbering print mode.
[Code]	<1D>H<43>H<30>H<m><n>
[Range]	$0 \leqq m \leqq 5$ $0 \leqq n \leqq 2$
[Outline]	This command sets the numbering(serial number counter) print mode. m denotes the number of print columns.

m=0　　　Prints the columns indicated by numeral. In theis case, n has no meaning.

m=1 to 5　Indicates the maximum number of columns to be printed.
If a counter value is larger than this the number of columns set with this command, the printer will the lower m-columns of the counter value.

n specifies a printing position within the printing columns.

n=0　　　Prints the data right justified. The blank columns are spaced.

n=1　　　Prints the data right justified. The blank columns are filled with "0".

n=2　　　Prints the data left justified. The right blank will become invalid.

[Caution]	• If either m or n has a value beyond their ranges, that setting will becomes invalid.
[Default]	m = 0 , n = 0
[See Also]	GS C1, GS C2, GS c, GS C;

[Sample Program]

```
LPRINT CHR$(&H1D) ;"C0";
LPRINT CHR$(0);CHR$(0);
GOUSAB *CNT
LPRINT CHR$(&H1D);"C0";
LPRINT CHR$(1); CHR$(0);
GOUSAB *CNT
LPRINT CHR$(&H1D);"C0";
LPRINT CHR$(3) CHR$(0);
GOUSAB *CNT
LPRINT CHR$(&H1D);"C0";
LPRINT CHR$(3); CHR$(1)
GOUSAB *CNT
LPRINT CHR$(&H1D);"C0";
LPRINT CHR$(3) CHR$(2);
GOUSAB *CNT
END
```

```
          *CNT
          FORI = 1 TO 5
LPRINT CHR$(&H1D);"c";
          NEXT I
          LPRINT CHR$(&HA);
RETURN
```

[Print Result]

12345 ←————————— Counts from 1 to 5 at m = 0 and n = 0.
67890 ←————————— Counts from 6 to 10 at m = 1 and n = 0.
　11 12 13 14 15 ←—— Counts from11 to 15 at m = 3 and n = 0.
0160 170 180 19020 ← Counts from 16 to 20 at m = 3 and n = 1.
21 22 23 24 25 ←——— Counts from 21 to 25 at m = 3 and n = 2.

GS C1 n1 n2 n3 n4 n5 n6

[Function]	Setting the numbering counter mode (A)
[Code]	<1D>H<43>H<31>H<n1><n2><n3><n4><n5><n6>
[Range]	$0 \leqq n1 , n2 , n3 , n4 , n5 , n6 \leqq 255$
[Outline]	This command sets the numbering(serial number counter) mode.

$n1 + n2 \times 256(n1 = \text{remainder}, n2 = \text{quotient})$: Counter default

$n3 + n4 \times 256(n3 = \text{remainder}, n4 = \text{quotient})$: Counter final value

$n5$: Counter step value

$n6$: Idential counter print counter

$(n1 + n2 \times 256) < (n3 + n4 \times 256)$: Count-up system

$(n1 + n2 \times 256) > (n3 + n4 \times 256)$: Count-down system

$(n1 + n2 \times 256) = (n3 + n4 \times 256)$ or $n5 = 0$ or $n6 = 0$: Counter stop

[Default]	$n1 + n2 \times 256 = 1$
	$n3 + n4 \times 256 = 65535$
	$n5 = 1$
	$n6 = 1$
[See Also]	GS C0 , GS C2 , GS c , GS C ;
[Sample Program]	

```
LPRINT CHR$(&H1D) ;"C0";          *CNT
LPRINT CHR$(3);CHR$(0);           FORI = 1 TO 5
LPRINT CHR$(&H1D);"C1";              LPRINT CHR$(&H1D)"c";
LPRINT CHR$(50) CHR$(0);          NEXT I
LPRINT CHR$(0);CHR$(0);           LPRINT CHR$(&HA);
LPRINT CHR$(5);CHR$(2);           RETURN
GOUSAB *CNT
LPRINT CHR$(&H1D);"C2"
LPRINT CHR$(5); CHR$(0);
GOUSAB *CNT
END
```

[Print Result]

When setting a count-down range = 0 to 50 step value = 5, repeat count = 2, and start value = 5 to

50 50 45 45 40 40 ←—— print a counte value.

 5   0 50 45 40 35 ←—— When setting a count-down range = 0 to 50, step cleared)

GS C2 n1 n2

[Function]	Setting the numbering counter
[Code]	<1D>H<43>H<32>H<n1><n2>
[Range]	$0 \leqq n1 \leqq 255$
	$0 \leqq n2 \leqq 255$
[Outline]	This command sets the numbering (serial number counter) value.
	n1 + n2 x 256(n1= remainder, n2=quotient) becomes a counter value.
[Caution]	• If the counter is set with this command, a repeat count of the idential count will be cleared. If the counter value is beyond the Range specified with the "GS C1" or "GS C;" command, the counter will be initialized.
[Default]	Not defined.
[See Also]	GS C0, GS C1, GS c, GS C;
[Sample Program]	
[Print Result]	See the sample program and print result for the GS C1 command.

GS C ; n1 ; n2 ; n3 ; n4 ; n5 ;

[Function]	Setting the numbering counter mode (B)
[Code]	<1D>H<43>H<3B>H<n1><3B>H<n2><3B>H<n2>
	<3B>H<n3><3B>H<n4><3B>H<n5><3B>H
	<n1>,<n2>,<n3>,<n4>,<n5> are character codes.
[Range]	$0 \leqq$ n1 , n2 , n5 $\leqq 65535$
	$0 \leqq$ n3 , n4 $\leqq 255$

[Outline]   This command sets the numbering (serial number counter) mode and a counter value.

n1	: Counter default
n2	: Counter final value
n3	: Counter step value
n4	: Idential counter print count
n5	: Counter start value
n1 < n2	: Count-up system
n1 > n2	: Count-down system
n1 = n 2 or n3 = 0 or n4 = 0	: Counter stop

[Caution]   If the n5 counter start value is beyond the counter range specified with n1 and n2, it is assumed to be n1 = n5.
If each value of n1 through n5 contains the character code other than "0" through "9", the printer will invalidate the data up to that parameter and handle the subsequent data as normal data.

[Default]
n1 = 1
n2 = 65535
n3 = 1
n4 = 1
n5 = 1

[See Also]   GS C0 , GS C1 , GS C2 , GS c

[Sample Program]

```
LPRINT CHR$(&H1D) ;"C0";          *CNT
LPRINT CHR$(3);CHR$(0);           FORI = 1 TO 5
LPRINT CHR$(&H1D);"C;";              LPRINT CHR$(&H1D);"c";
LPRINT "50;0;5;2;50;              NEXT I
GOUSAB *CNT                       LPRINT CHR$(&HA);
LPRINT CHR$(&H1D);"C;";           RETURN
LPRINT "50;0;5;2;5";
GOUSAB *CNT
END
```

[Print Result]

When setting a count-down range = 0 to 50, step value = 5, repeat count = 2, and start value = 50 to
50 50 45 45 40 40 ←—— print a counte value.
5 0 50 45 40 35 ←—— When setting a count-down range = 0 to 50, step value = 5, repeat count = 1, and start value = 5 to print a counter value.

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GS c

[Function]	Print the counter
[Code]	<1D>H<63>H
[Outline]	This command prints the serial number counter data. After setting the current counter value in the print buffer as the print data (Character string), it increments or decrements the counter according to the set count mode.
[Caution]	• When setting the value in the print buffer, its format depends on the GS c command, the counter will be initialized to the set default.
[See Also]	GS C0 , GS C1 , GS C2 , GS C ;
[Print Result]	See the sample programs and print results for the GS C1 command.

GS I n1L n1H n2L n2H   (Only for Label Paper)

[Function]	Setting the label length
[Code]	<1D>H<6C>H<n1L><n1H><n2L><n2H>
[Range]	$0 \leqq n1L \leqq 255$ ($24 \leqq n1L + n1H \times 256 \leqq 360$)
	$0 \leqq n1H \leqq 1$
	$8 \leqq n2L \leqq 30$ (Label paper)
	$4 \leqq n2L \leqq 8$ (Black mark paper)
	$n2H = 0$
[Outline]	Define the specifications (length) of the label used.
	n1: Sets the label length (Gap between black mark paper)
	n2: Sets the label gap length (black mark paper length)
	nl and n2 are specified units of millimeters.
	Divide the maximum label length by 256 and make the quotient n1L and the remainder n2H.
[Caution]	• If the specified length is outside of label specifications, the default length is set.
	• 360 mm is the maximum label length allowed to define and 24 mm is the minimum.
	• 30 mm is the maximum allowable label gap length to define and 8 mm (4 mm black mark paper length) is the minimum.
[Default]	• The following default values are set when DS2-9 is set to ON.
	Label paper:
	Label length = 25 mm (n1L=25 n1H=0): Label gap length = 8 mm (n2L=8 n2H=0)
	Black mark paper:
	Black mark paper gap = 25 mm (n1L=25 n1H=0)
	Black mark paper length = 4 mm (n2L=4 n2H=0)

Label Paper   Black Mark Paper