

# Command Reference

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## 2. Print Control Functions

### 2-1. Control Code List

	Character	Command	STANDARD MODE	PAGE MODE	Affect by GSP
	HT	Horizontal Tab	†	†	
	LF	Printing and Line Feed	†	†	
	FF	Form Feed		†	
	CR	Returning to printing	†	†	
	CAN	Canceling print data in PAGE MODE		†	
	RS	Journal Tab	†		
	DLE EOT	Real-time sending of status	†	†	
	DLE ENQ	Real-time request to printer	†	†	
	DLE DC4	Real-time output of specified pulse			
	ESC FF	Data printing in PAGE MODE		†	
	ESC SP	Setting the spacing of characters	†	†	†
	ESC !	Collectively specifying a printing mode	†	†	
	ESC \$	Specifying the absolute printing positions	†	†	†
	ESC %	Specifying/Canceling the download character set	†	†	
	ESC &	Defining the download characters	†	†	
	ESC *	Specifying the bit image mode	†	†	
	ESC -	Specifying/Canceling underline	†	†	
	ESC 2	Specifying the 1/6-inch line feed rate	†	†	
	ESC 3	Setting the line feed rate	†	†	†
	ESC =	Data input control	†	†	
	ESC ?	Deleting the download characters	†	†	
	ESC @	Initializing the printer	†	†	
	ESC D	Specifying horizontal tab positions	†	†	
	ESC E	Specifying/Canceling emphasis printing	†	†	
	ESC G	Specifying/Canceling double strike printing	†	†	
	ESC J	Printing and feeding paper	†	†	†
	ESC L	Selecting PAGE MODE	Line		
	ESC M	Selection of character fonts	†	†	
	ESC R	Selecting the international character set	†	†	
	ESC S	Selecting STANDARD MODE		†	
	ESC T	Selection of character printing direction in PAGE MODE	Setting	†	
	ESC V	Specifying/Canceling 90 ° -right-turned characters	†	Setting	
	ESC W	Setting the print area in PAGE MODE	Setting	†	†
	ESC \	Specifying the relative printing position	†	†	†
	ESC a	Aligning the characters	Line	Setting	

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	Character	Command	STANDARD MODE	PAGE MODE	Affect by GSP
	ESC C0	Selection of printing sheet	Line		
	ESC C1	Selection of setting sheet	‡	‡	
	ESC C2	Selecting the Paper Sensor valid for a paper end signal output	‡	‡	
	ESC C3	Selecting the paper sensor valid for print stop	‡	‡	
	ESC C4	Selecting the paper sensor valid for print stop	‡	‡	
	ESC C5	Enabling/Disabling the panel switches	‡	‡	
	ESC d	Printing and feeding paper by “n” lines	‡	‡	
	ESC P	Generating the specified pulse	‡	‡	
	ESC t	Selecting the character code table	‡	‡	
	ESC {	Specifying/Canceling the inverted characters	Line	Setting	
	ESC~f	Font specifying command	‡	‡	
	FS g 1	Writing data into the user NV memory	‡		
	FS g 2	Reading data from the user NV memory	(Line)		
	FS P	Printing the NV bit images	‡	Disabling	
	FS q	Defining the NV bit images	(Line)	Disabling	
	ESC i	Full cut	ρ	ρ	
	ESC m	Partial cut (Leaving one area uncut)	ρ	ρ	
	ESC s	Specifying a printing mode	■	■	
	ESC u	Status signal of peripheral equipment	ρ	ρ	
	ESC v	Signal of printer status	ρ	ρ	
	ESC z	Printing the same data to Receipt/Journal	(Line)		
	GS !	Specifying character sizes	‡	‡	
	GS \$	Specifying the absolute vertical position of characters in PAGE MODE		‡	‡
	GS *	Defining download bit images	‡	‡	
	GS ( A	Execution of test printing	‡	‡	
	GS /	Printing download bit images	‡	‡	
	GS :	Starting/Ending the macro definition	‡	‡	
	GS B	Specifying/Canceling the black/white inverted printing	‡	‡	
	GS H	Selecting of printing position of HRI characters	‡	‡	
	GS I	Sending the printer ID	‡	‡	
	GS L	Setting the left margin	(Line)	Setting	‡
	GS M	Specifying/Canceling the micro characters	‡	‡	
	GS P	Setting the basic calculation pitch	‡	‡	
	GS V	Paper cutting	(Line)	‡	‡
	GS W	Setting the print area width	(Line)	Setting	‡
	GS \	Specifying the relative vertical position in PAGE MODE		‡	‡
	GS ^	Execution of macro	‡	‡	
	GS a	Enabling/Disabling Automatic Status Back	‡	‡	
	GS b	Specifying/Canceling smoothing	‡	‡	
	GS f	Selection of font for HRI characters	‡	‡	
	GS h	Selection of height of the bar code	‡	‡	
	GS k	Printing the bar code	‡	‡	
	GS r	Sending of status	‡	‡	
	GS v 0	Printing of raster bit image	‡	‡	
	GS w	Selection of horizontal size (magnification) of bar code	‡	‡	

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‡ = Enabling

No mark = Disabling

Line = Command which is valid at the line head

Setting = Command by which only setting is valid

ρ = Non-recommendable command (command provided only for maintaining compatibility with Version 1)

■ = Command for maintenance (which cannot be used by customers)

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### 3. Descriptions of Control Code

#### Horizontal Tab [HT]

---

HT

[ASCII] HT  
[Decimal] 9  
[Hexadecimal] 09

[Parameter]

[Description]

- Shifts the printing position to the next horizontal tab position. The horizontal tab position is set by ESC D. The initial setting is at intervals of 8 characters for Font A (at 9th, 17th, 25th, 33rd columns).

#### Printing and Line Feed [LF]

---

LF

[ASCII] LF  
[Decimal] 10  
[Hexadecimal] 0A

[Parameter]

[Description]

- By specifying the C/R operation set inside the printer, the operations will be as follows:

**<In case of CR+LF>**

- If data exist inside the print buffer, line feed is performed after printout. Without data, only line feed is performed. The next printing position becomes the head of line. If LF code is entered right after CR code, the LF code will be ignored.

**<In case of LF and being ignored>**

- If data exist inside the print buffer, line feed is performed after printout. Without data, only line feed is performed. The next printing position becomes the head of line.
- Even if LF code is entered right after CR code, the LF code will not be ignored.

#### Form Feed [FF]

---

FF

[ASCII] FF  
[Decimal] 12  
[Hexadecimal] 0C

[Parameter]

[Description]

- Executes a batch printout of the data mapped in the print area and returns to STANDARD MODE. All data is erased after printout.
- This command is effective only in PAGE MODE.

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## Returning to printing [CR]

---

CR

[ASCII]            CR  
[Decimal]         13  
[Hexadecimal]    0D

[Parameter]

[Description]

- By specifying the C/R operation set inside the printer, the operations will be as follows:

**<In case of CR+LF>**

If data exist inside the print buffer, line feed is performed after printout.  
Without data, only line feed is performed. The next printing position becomes the head of line.  
If LF code is entered right after CR code, the LF code will be ignored.

**<In case of LF >**

If data exist inside the print buffer, line feed is performed after printout.  
Without data, only line feed is performed. The next printing position becomes the head of line.  
Even if LF code is entered right after CR code, the LF code will not be ignored.

**<In case of being ignored>**

This code is ignored.

## Data canceling in PAGE MODE [CAN]

---

CAN

[ASCII]            CAN  
[Decimal]         24  
[Hexadecimal]    18

[Parameter]

[Description]

- Erases all data contained in the print area set in PAGE MODE. All data in the previously set print area are also erased if they are in the currently specified print area.
- This command is effective only in PAGE MODE.

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[ASCII] RS  
[Decimal] 30  
[Hexadecimal] 1E

[Parameter]

[Description]

- Shifts the printing position to the head of journal paper.
- This command is effective only when both of RECEIPT/JOURNAL are selected (ESC“c1”3) and printout of the same data to RECEIPT/JOURNAL is canceled (ESC“z”0).
- If data are entered in PAGE MODE, this command will become invalid.

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Real-time sending of status [DLE EOT]

DLE EOT

[ASCII]	DLE	EOT	n
[Decimal]	16	4	n
[Hexadecimal]	10	04	n

[Parameter]  $1 \leq n \leq 4h$

[Description]

- Sends in real-time the status specified by “n”.
  - n=1: Printer status.
  - n=2: Status caused by an offline condition.
  - n=3: Status caused by an error.
  - n=4: Paper detector status.
- Each status represents the current status.
- The status is transferred without checking whether the host is ready to receive or busy.
- This command is dealt with when it is received.
- If the same data string as that with this command is received, the same operation will be performed. Therefore, the user should be reminded of this fact. (Bit Image, etc.)
- This command cannot be interleaved into the code string of another command consisting of 2 bytes or more codes.
- If ASB is valid, it is necessary to discriminate between the status due to this command and the status due to ASB.

Note) For details of ASB (Automatic Status Back), refer to the section of GS a.

(1) n = 1: In case of printer status

Bit	Function	Value	
		0	1
0	Unused	Fixed at 0	
1	Unused	Fixed at 1	
2	Status of Pin 3 of Drawer	“L”	“H”
3	Online/Offline	Online	Offline
4	Unused	Fixed at 1	
5	Undefined	–	–
6	Undefined	–	–
7	Unused	Fixed at 0	

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(2) n = 2: In case of status caused by an offline condition

		Value	
		0	1
0	Unused	Fixed at 0	
1	Unused	Fixed at 1	
2	Lever open	Lever closed	Lever opened
3	Paper feed by paper feed switch	Not in paper feed state	In paper feed state
4	Unused	Fixed at 1	
5	Printing stop because of "paper out" state	No stopping	Stopping
6	Error occurred	Not occurred	Occurred
7	Unused	Fixed at 0	

Bit 5: If the paper end detector detects a "paper out" state, or the paper near-end sensor is enabled by ESC C4, printing will be stopped. At this time, bit 5 = 1.

N = 3: In case of status caused by an error

Bit	Function	Value	
		0	1
0	Unused	Fixed at 0	
1	Unused	Fixed at 1	
2	Undefined	-	-
3	Auto Cutter error occurred	No error	Error occurred
4	Unused	Fixed at 1	
5	Unrecoverable error occurred	No error	Error occurred
6	Auto recovery error occurred	No error	Error occurred
7	Unused	Fixed at 0	

Bit 3: If this error occurs due to causes such as a paper jam, remove the cause of the error.

Then DLE ENQ n (1 ≤ n ≤ 2) can be used to recover from the error.

It is not possible, however, to recover from any error due to defect in hardware or mechanism.

Bit 6: If a head overheat is detected, it will become "1". If the temperature falls, it will become "0".

N=4: In case of paper detector status

Bit	Function	Value	
		0	1
0	Unused	Fixed at 0	
1	Unused	Fixed at 1	
2	Detecting Journal Near-end	Paper found	Paper not found
3	Detecting Receipt Near-end	Paper found	Paper not found
4	Unused	Fixed at 1	
5	Detecting Journal paper-end	Paper found	Paper not found
6	Detecting Receipt paper-end	Paper found	Paper not found
7	Unused	Fixed at 0	

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Real-time request of status [DLE ENQ]

DLE ENQ

[ASCII]	DLE	ENQ	n
[Decimal]	16	5	n
[Hexadecimal]	10	05	n

[Parameter]  $1 \leq n \leq 2h$

[Description]

- Responds in real-time to the request that the host specifies with number “n”.
  - n=1: After recovering from an error, the printer resumes printing from the beginning of the line where the error occurred.
  - n=2: After clearing the receive buffer and the print buffer, the printer recovers from the error.
- This command is effective only when an auto cutter error has occurred.
- If the same data string as that with this command is received, the same operation will be performed. Therefore, the user should be reminded of this fact.  
(Bit Image, etc.)
- This command cannot be interleaved into the code string of another command consisting of 2 bytes or more codes.

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Real-time output of specified pulse [DLE DC4]

DLE DC4

[ASCII]            DLE   DC4        n    m    t  
 [Decimal]        16     20        n    m    t  
 [Hexadecimal]   10     14        n    m    t

[Parameter]       n=1   m=0, 1   1≤t≤8

[Description]

- 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

- On-time is set at  $t \times 100\text{ms}$  and off-time is set at  $t \times 100\text{ms}$ .
- In case an error occurred during the processing of this command, this command is ignored.
- In case pulse output was being performed during the processing of this command (ESC P or DEL DC 4 is being executed), this command is ignored.
- This command will be processed as it is received.
- In specification of serial interface, this command is executed even in off-line, reception buffer full and error conditions.

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Data printing in PAGE MODE [ESC FF]

ESC FF

[ASCII]           ESC    FF  
 [Decimal]        27     12  
 [Hexadecimal]   1B     0C

[Parameter]

[Description]

- Executes a batch printout of data mapped in the print area in PAGE MODE. Data, ESC T and ESC W settings and the character mapping position are held even after printing.

Setting the spacing of characters [ESC SP]

ESC SP

[ASCII]           ESC    SP    n  
 [Decimal]        27     32    n  
 [Hexadecimal]   1B     20    n

[Parameter]       0≤n≤FFh

[Description]

- Default    n=0
  - Sets the right spacing of characters to [n × basic calculation pitch] inches.
  - If the horizontal magnification of character is 2 or more, the spacing increases with the magnification.
  - The basic calculation pitch is set by GS P. Once the right spacing is set, it will not be changed even if the basic calculation pitch is changed by GS P.
  - In STANDARD MODE, the horizontal basic calculation pitch x is used.
  - In PAGE MODE
    - If the start point specified by ESC T is top left or bottom left, the horizontal basic calculation pitch x is used.
    - If the start point specified by ESC T is top right or bottom right, the vertical basic calculation pitch y is used.
- The character size can be specified also by GS !, but the last set command will become effective.  
 The initial value is n=0.

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Collectively specifying a printing mode [ESC !]

ESC !

[ASCII]           ESC     !     n  
 [Decimal]        27     33     n  
 [Hexadecimal]   1B     21     n

[Parameter]      0≤n≤FFh

[Description]

- Printing mode is specified with each bit.

Bit	Function	Value	
		Hexadecimal number	Decimal number
0	Character Font A (12*24)	00	0
	Character Font B (9*24)	01	1
1	Undefined		
2	Undefined		
3	Canceling emphasis	00	0
	Specifying emphasis	08	8
4	Canceling double height	00	0
	Specifying double height	10	16
5	Canceling double width	00	0
	Specifying double width	20	32
6	Undefined	-	-
7	Canceling underline	00	0
	Specifying underline	80	128

- With double height and double width of bit being specified simultaneously, quadruple characters are created.
- An underline is attached to the full character width but not attached to the part having been skipped by the horizontal tab, ESC“\” and ESC“\$”. Neither is it attached to 90°-turned characters.
- The underline width is as specified by the <ESC → command regardless of character size.
- The underline can be specified also by the <ESC → command but the last processed command will become effective.
- The character size can be specified also by GS !, but the last processed command will become effective.
- Printing of characters with different sizes such as double-size characters and normal-size characters is possible.
- The initial value is n=0.

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Specifying the absolute printing position [ESC \$]

ESC \$

[ASCII]	ESC	\$	n1	n2
[Decimal]	27	36	n1	n2
[Hexadecimal]	1B	24	n1	n2

[Parameter]  $0 \leq n1 \leq FFh$   $0 \leq n2 \leq FFh$

[Description]

- Specifies the next printing start position by the absolute position with reference to the left margin. The printing position is set by [16 bit specification value × basic calculation pitch] inches.
- The basic calculation pitch is set by GS P.
- “n1” is the low 8 bits of 16 bit data and “n2” is the high 8 bits.
- If the calculation leaves a fraction, the fraction is corrected with the minimum pitch of the mechanism (203DPI) and the remainder is omitted.
- Specification beyond the printing area is ignored.
- In STANDARD MODE, the basic calculation pitch x is used.
- In PAGE MODE,
  - If the start point specified by ESC T is top left or bottom left, the horizontal basic calculation pitch x is used.
  - If the start point specified by ESC T is top right or bottom right, the vertical basic calculation pitch y is used.

Specifying/Canceling the download character set [ESC %]

ESC %

[ASCII]	ESC	%	n
[Decimal]	27	37	n
[Hexadecimal]	1B	25	n

[Parameter]  $0 \leq n \leq FFh$

[Description]

- Specifying/Canceling the download characters
- The lowest bit “n0” is valid for “n”.
  - With n=<\*\*\*\*\*0>B, the download character set is canceled.
  - With n=<\*\*\*\*\*1>B, the download character set is specified.
- Only the lowest bit is valid for “n”.
- If the download character set is canceled, the internal character set will be automatically specified.
- Download characters and download bit images (GS\*) cannot be defined simultaneously.
- The initial value is n=0.

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Defining the download characters [ESC &]

ESC &

[ASCII]	ESC	&	s	n	m	a	p1...pn
[Decimal]	27	38	s	n	m	a	p1...pn
[Hexadecimal]	1B	26	s	n	m	a	p1...pn

[Parameter]	s=3h (Font A, B)	2h (Font C)
	0≤n≤7Eh	20h≤m≤7Eh
	In case of Font A,	0≤a≤0Ch
	In case of Font B,	0≤a≤09h
	In case of Font C,	0≤a≤08h
		0≤p1...pn≤255

[Description]

- Defines the download characters of alphabet, number and Kana.
- “s” indicates the number of bytes in vertical direction.
- “n” indicates the start character code and “m” indicates the end character code. To define only one character, set n=m.
- Definable character codes include 95 characters at maximum in the range of ASCII code (20h to 7Eh).
- “a” indicates the number of dots in horizontal direction.
- “pn” is the data to be defined, which indicates the pattern equal to “a” dots in horizontal direction from the left end. The rest of pattern on the right side is filled with space.
- Once download characters are defined, they remain valid until redefinition, execution of ESC “@” and GS “\*” or power OFF is performed.
- It is possible to check with the ESC “v” command whether download is being performed.  
(Only in case of serial I/F)

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		<b>B</b>	

Defining characters to blank pages [ESC (]

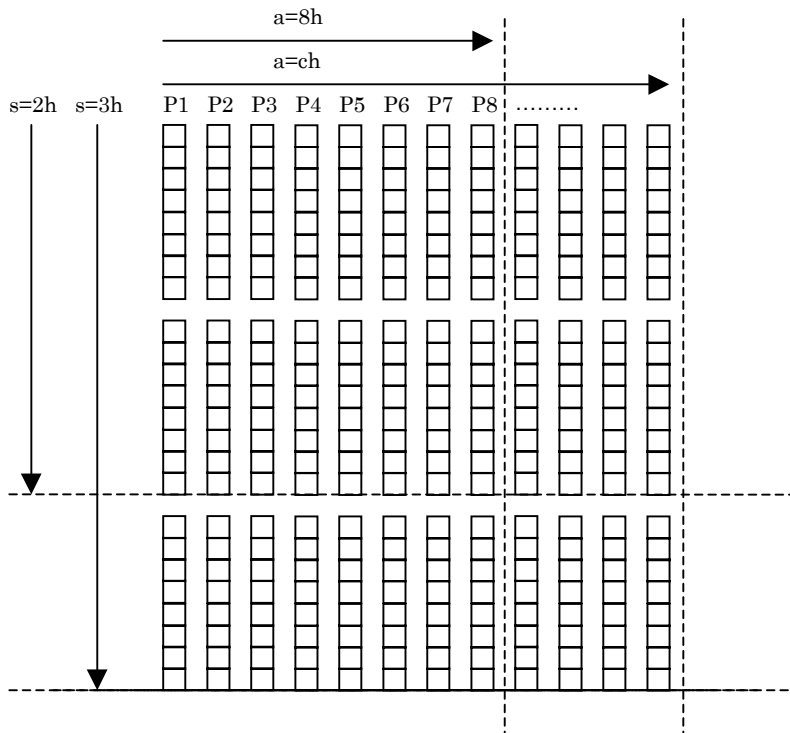
ESC (

[ASCII]	ESC	(	s	a	n	m	p1...pn
[Decimal]	27	40	s	a	n	m	p1...pn
[Hexadecimal]	1B	28	s	a	n	m	p1...pn

[Parameter] s = 3h (Font A, B) 2h (Font C)  
 80h ≤ n ≤ FFh 80h ≤ m ≤ FFh  
 In case of Font A, a = 0Ch  
 In case of Font B, a = 0Ch  
 In case of Font C, a = 08h  
 0 p1...pn 255

[Description]

- Defines characters to blank pages.
- The characters defined with this command are stored in the nonvolatile memory. Therefore, even if the printer is powered OFF, the definition details will be held.
- “s” indicates the number of bytes in vertical direction.
- “n” indicates the start character code and “m” indicates the end character code. To define only one character, set n=m.
- Definable character codes are in the range of ASCII code (80h to FFh).
- “a” indicates the number of dots in horizontal direction. If characters of Font B are defined, specify 12 dots with command, define 9 dots for character data. Configure the remaining 4 dots with white data.
- “pn” is the data to be defined, which indicates the pattern equal to “a” dots in horizontal direction from the left end. The rest of pattern on the right side is filled with space.
- By specifying a blank page with ESC t 255, printing is performed.
- The alignment of data is as follows.



Specifying the bit image mode [ESC \*]

ESC \*

[ASCII]           ESC    \*    m    n1   n2   dn  
 [Decimal]        27    42    m    n1   n2   dn  
 [Hexadecimal]   1B    2A    m    n1   n2   dn

[Parameter]       m=0, 1, 20h  21h  0≤n1≤FFh  0≤n2≤03h

[Description]

- According to the bit image mode specified by m, bit image data are printed.
- The number of dots printed is specified as 16 bits. “n1” is the low 8 bits and “n2” is the high 8 bits.
- If bit image data have been input excess of dot positions that can be printed on one line, the excess data are discarded.
- Concerning bit image data (dn), bits to be printed are specified as “1” and bits not to be printed as “0”.
- The printing modes specified by m are as follows:

m(h)	Mode	Vertical direction		Horizontal direction
		No. of Dots	Dot Density	Dot Density
0	8-dots single density	8	67DPI	101DPI
1	8-dots double density	8	67DPI	203DPI
20	24 dots single density	24	203DPI	101DPI
21	24 dots double density	24	203DPI	203DPI

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

<b>CITIZEN</b>	TITLE:	SHEET	16
	PB-32/33	REVISION B	16/85

Specifying/Canceling an underline [ESC -]

ESC -

[ASCII]           ESC    -    n  
 [Decimal]        27     45    n  
 [Hexadecimal]   1B     2D    n

[Parameter]       0≤n≤02h, 30h≤n≤32h

[Description]

- Specifying/Canceling an underline.
- An underline is attached to the full character width but not attached to the part having been skipped by the horizontal tab (HT) and the dot position shifts (ESC \$, ESC \). Neither is it attached to 90°-turned characters.
- The kinds of underline specified by n are as follows:
  - n=0 : Canceling an underline.
  - n=1: Specifying an underline for 1-dot width.
  - n=2: Specifying an underline for 2- dots width.
- The width of underline is a specified width regardless of character size.
- The underline can be specified also by ESC !, but the last processed command will become effective.
- The initial value is n=0.

<b>CITIZEN</b>	TITLE:  <b>PB-32/33</b>	SHEET REVISION  <b>A</b>	17
			17/85

Specifying the 1/6-inch line feed rate [ESC 2]

ESC 2

[ASCII]	ESC	2
[Decimal]	27	50
[Hexadecimal]	1B	32

[Parameter]

[Description]

- Sets the line feed rate per line to 1/6-inch.

Setting the line feed rate [ESC 3]

ESC 3

[ASCII]	ESC	3	n
[Decimal]	27	51	n
[Hexadecimal]	1B	33	n

[Parameter]  $0h \leq n \leq FFh$

[Description]

- Sets the line feed rate per line to [n × basic calculation pitch] inches.
- Sets the line feed rate to the selected setting sheet with ESC c1.
- Independent line feed rate can be set to Receipt and Journal, respectively. If printing of the same data to Receipt and Journal is specified and PAGE MODE printing is performed, the line feed rate of Journal will be ignored and the line feed rate of Receipt will become effective.
- Independent line feed rate can be set for STANDARD MODE and PAGE MODE, respectively.
- The basic calculation pitch is set by GS P. Once the line feed rate is set, it will not be changed even if the basic calculation pitch is changed by GS P.
- If the calculation leaves a fraction, the fraction will be corrected with the minimum pitch of mechanism (203DPI) and the remainder will be omitted.
- In STANDARD MODE, the vertical basic calculation pitch y is used.
- In PAGE MODE,
  - If the start point specified by ESC T is top left or bottom right, the horizontal basic calculation pitch y is used.
  - If the start point specified by ESC T is top right or bottom left, the vertical basic calculation pitch x is used.
- If the specified line feed rate is smaller than the printing character size (vertical length), the line feed rate will become a printing character size.
- The maximum settable line feed width is 40 inches. If the line feed width is specified to the value greater than this maximum value, it will be trimmed to the maximum.
- The initial value is n=22h and approximately 1/6 inches (4.25mm)

<b>CITIZEN</b>	TITLE:	<b>PB-32/33</b>	SHEET REVISION	18
			<b>B</b>	18/85

Data input control [ESC =]

ESC =

[ASCII]           ESC     =     n  
 [Decimal]        27     61     n  
 [Hexadecimal]   1B     3D     n

[Parameter]       0≤n≤FF

[Description]

- Selects an equipment for which data input from the host is valid.
- Each bit of “n” is as follows:

Bit	Function	Value	
		Hexadecimal number	Decimal number
0	Printer Valid	00	0
	Printer Invalid	01	1
1	Undefined		
2	Undefined		
3	Undefined		
4	Undefined		
5	Undefined		
6	Undefined		
7	Undefined		

- When the printer has not been selected, the printer abandons all received data until it is selected by this command.
- Even when the printer has not been selected, it may become a BUSY state through any printer operation.
- The initial value is n=1.

<b>CITIZEN</b>	TITLE:  <b>PB-32/33</b>	SHEET REVISION  <b>B</b>	19
			19/85

Deleting the download characters [ESC ?]

---

ESC ?

[ASCII]           ESC     ?     n  
[Decimal]         27     63     n  
[Hexadecimal]    1B     3F     n

[Parameter]       20≤n≤ 7E

[Description]

- Deletes the download characters of specified code.
- “n” indicates the code of characters to be deleted.
- This command deletes the character font selected by ESC !.
- If the specified character code is undefined, this command will be ignored.

Initializing the printer [ESC @]

---

ESC @

[ASCII]           ESC     @  
[Decimal]         27     64  
[Hexadecimal]    1B     40

[Parameter]

[Description]

- Clears data stored in the print buffer and initializes various settings.
- Macro definitions are not cleared.
- Data in the receiving buffer are maintained.
- NV bit image definitions are maintained.
- User NV memory data are maintained.

<b>CITIZEN</b>	TITLE:	SHEET	20
	<b>PB-32/33</b>	REVISION	20/85
		<b>B</b>	



Setting the horizontal tab format [ESC D]

ESC D

[ASCII]	ESC	D	n1...nK	NULL
[Decimal]	27	68	n1...nK	NULL
[Hexadecimal]	1B	44	n1...nK	NULL

[Parameter]  $1 \leq n \leq 255$   $0 \leq k \leq 32$

[Description]

- Sets the horizontal tab position.
- “n” indicates the number of columns between the left margin and the horizontal tab setting position. If n=8 is specified, for example, the next printing position will be shifted to the ninth column by execution of HT.
- “k” indicates the number of horizontal tab position data to be set.
- The tab position is set to the position defined by “character width × n from the left margin”.
- At this time, the character width includes space between characters. If a horizontal magnification of character is 2 or more, the character width will increase with the magnification.
- <n> which denotes a setting position is processed in the increasing order and ends at <00>h. When <n> is equal to or smaller than its preceding <n>, the tab setting is finished. Then, the next data onward will be processed as normal data.
- Settable tab positions are maximum 32. Tab positions specified exceeding this limit is ignored.
- ESC “D”NULL clears all the set tab positions. The horizontal tab (HT) command after clearing is ignored.
- Default is Font A and positions at eight-character intervals (9th, 17th, 25th, 33rd,...“n”th columns) at the right spacing =0.

<b>CITIZEN</b>	TITLE:  PB-32/33	SHEET REVISION  B	21
			21/85

Specifying/Canceling emphasis printing [ESC E]

ESC E

[ASCII]           ESC     E     n  
 [Decimal]        27     69     n  
 [Hexadecimal]   1B     45     n

[Parameter]       0≤n≤FFh

[Description]

- Specifies/Canceling the printing of emphasized characters.
- “n” is valid for the lowest bit (n0).
- Control by the lowest bit is as follows:  
   n=0: Canceling emphasis printing.  
   n=1: Specifying emphasis printing.

Specifying/Canceling double strike printing [ESC G]

ESC G

[ASCII]           ESC     G     n  
 [Decimal]        27     71     n  
 [Hexadecimal]   1B     47     n

[Parameter]       0≤n≤FFh

[Description]

- Specifies/Canceling the double strike printing.
- “n” is valid for the lowest bit (n0).
- Control by the lowest bit is as follows:  
   n=0: Canceling double strike printing.  
   n=1: Specifying double strike printing.
- With this printer, double-strike printing and emphasis printing provide completely the same result.

<b>CITIZEN</b>	TITLE:	SHEET REVISION <b>A</b>	22
	<b>PB-32/33</b>		22/85

Printing and feeding paper [ESC J]

ESC J

[ASCII]           ESC     J     n  
 [Decimal]        27     74     n  
 [Hexadecimal]   1B     4A     n

[Parameter]       0≤n≤FFh

[Description]

- Prints data stored in the print buffer and feeds paper by [n × basic calculation pitch] inches.
- After execution of this command, the beginning of line becomes the next print start position.
- 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.
- If the calculation leaves a fraction, the fraction will be corrected with the minimum pitch of the mechanism (203DPI) and the remainder will be omitted.
- In STANDARD MODE, the vertical basic calculation pitch y is used.
- In PAGE MODE,
  - If the start point specified by ESC T is top left or bottom right, the vertical basic calculation pitch y is used.
  - If the start point specified by ESC T is top right or bottom left, the horizontal basic calculation pitch x is used.
  - If the [n × basic calculation pitch] is specified to the value greater than 40 inches, it will be trimmed to 40 inches.

<b>CITIZEN</b>	TITLE:  <b>PB-32/33</b>	SHEET REVISION  <b>A</b>	23
			23/85

[ASCII]           ESC    L  
 [Decimal]        27     76  
 [Hexadecimal]   1B     4C

[Parameter]

[Description]

- Switches from STANDARD MODE to PAGE MODE.  
 This command becomes effective only if it is entered at the head of line.
- With FF code or ESC S, ESC @, STANDARD MODE is restored.
- The starting position of character mapping will be the point specified by ESC T within the print area specified by ESC W.
- The settings by the following commands, which have separate settings for PAGE MODE and STANDARD MODE, are changed to the settings for PAGE MODE.  
     Spacing setting:   ESC SP, FS S  
     Line feed setting: ESC 2, ESC 3
- In PAGE MODE, the following commands are effective only for setting.
  - (1) ESC V           Specifying/Canceling 90°-turned characters.
  - (2) ESC a           Alignment of characters
  - (3) ESC {           Specifying/Canceling inverted characters
  - (4) GS L            Setting the left margin
  - (5) GS W            Setting the print area
- In PAGE MODE, the following commands are ignored.
  - (1) GS (A           Execution of test printing
- In PAGE MODE, the following commands become invalid.
  - (1) FS p            Printing of NV bit image
  - (2) FS q            Definition of NV bit image
  - (3) FS g 1          Data writing to user NV memory
  - (4) GS v 0          Printing of raster bit image

<b>CITIZEN</b>	TITLE:	SHEET	24
	PB-32/33	REVISION	24/85
		A	

Selection of character fonts [ESC M]

ESC M

[ASCII]           ESC    M    n  
 [Decimal]        27     77    n  
 [Hexadecimal]   1B     4D    n

[Parameter]      n=0 , 1 , 48 , 49

[Description]

- Selects character fonts.

n	Function
0, 48	Selecting Font a (12 x 24).
1, 49	Selecting Font B (9 x 24).

Selecting the international character set [ESC R]

ESC R

[ASCII]           ESC    R    n  
 [Decimal]        27     82    n  
 [Hexadecimal]   1B     52    n

[Parameter]      0≤n≤0Dh

[Description]

- Selects the international character set.
- Default is Japan.

n=8h

n(HEX)	International character set
0	U.S.A.
1	France
2	Germany
3	U.K.
4	Denmark
5	Sweden
6	Italy
7	Spain
8	Japan
9	Norway
0A	Denmark 2
0B	Spain 2
0C	Latin America
0D	Korea
40	Legal

<b>CITIZEN</b>	TITLE:	<b>B</b>	25
	<b>PB-32/33</b>		25/85

## Selecting STANDARD MODE [ESC S]

ESC S

[ASCII]	ESC	S
[Decimal]	27	83
[Hexadecimal]	1B	53

[Parameter]

[Description]

- Switches from PAGE MODE to STANDARD MODE.
- This command is effective only if it is entered in PAGE MODE.
- Data mapped in PAGE MODE are cleared.
- The print area defined by ESC W is initialized.
- The settings by the following commands, which have separate settings for PAGE MODE and STANDARD MODE, are changed to the settings for PAGE MODE.
  - Spacing setting: ESC SP, FS S
  - Line feed setting: ESC 2, ESC 3
- In STANDARD MODE, the following commands are effective only for setting.
  - (1) ESC W Setting of print area in PAGE MODE
  - (2) ESC T Selection of printing direction of characters in PAGE MODE
- In STANDARD MODE, the following commands are ignored.
  - (1) GS \$ Specifying the absolute position of characters in vertical direction in PAGE MODE
  - (2) GS \ Specifying the relative position of characters in vertical direction in PAGE MODE
- When the printer is powered ON or reset, or when ESC @ is executed, STANDARD MODE is selected.

<b>CITIZEN</b>	TITLE:	SHEET	26
	PB-32/33	REVISION	26/85
		A	

Selection of character printing direction in PAGE MODE [ESC T]

ESC T

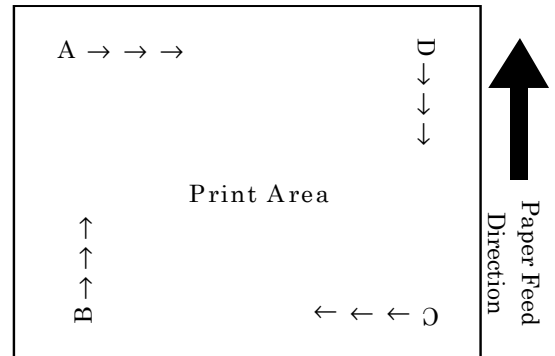
[ASCII] ESC T n  
 [Decimal] 27 84 n  
 [Hexadecimal] 1B 54 n

[Parameter]  $0 \leq n \leq 3h$ ,  $30h \leq n \leq 33h$

[Description]

- Selects the printing direction and starting point of characters in PAGE MODE.

n	Printing direction	Starting point
0,30h	Left to right	Top left (A in the figure)
1,31h	Bottom to top	Bottom left (B in the figure)
2,32h	Right to left	Bottom right (C in the figure)
3,33h	Top to bottom	Top right (D in the figure)



In STANDARD MODE, only internal settings of printer will be executed with this command. The character mapping position will be the starting point within the print area specified by ESC W. The basic calculation pitch “x” or “y” used by the following commands varies with starting point.

- If the starting point is top left or bottom right,
    - Commands using “x”: ESC SP, ESC \$, ESC \
    - Commands using “y”: ESC 3, ESC J, GS \$, GS \
  - If the starting point is top right or bottom left,
    - Commands using “x”: ESC 3, ESC J, GS \$, GS \
    - Commands using “y”: ESC SP, ESC \$, ESC \
- Default is n=0.

<b>CITIZEN</b>	TITLE:	SHEET	27
	PB-32/33	REVISION	27/85
		<b>B</b>	

[ASCII]           ESC     V     n  
 [Decimal]        27     86     n  
 [Hexadecimal]   1B     56     n

[Parameter]       $0 \leq n \leq 1h$ ,  $30h \leq n \leq 31h$

[Description]

- Specifying/Canceling 90°-right-turned characters.
- Depending on the “n” value, specifying or canceling is performed as follows:

n	Function
0, 30	Canceling 90°-right-turned characters
1, 31	Specifying 90°-right-turned characters.

- In PAGE MODE, settings with this command are not affected.
- In PAGE MODE, this command executes only the internal flagging of printer without affecting printing in PAGE MODE.
- Default is n=0.



Setting the print area in PAGE MODE [ESC W]

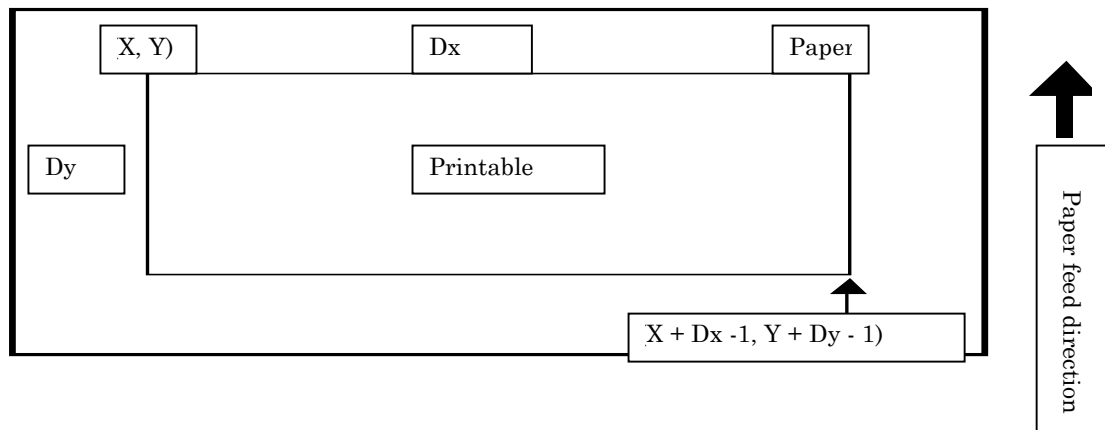
ESC W

[ASCII]	ESC	W	xL	xH	yL	yH	dxL	dxH	dyL	dyH
[Decimal]	27	87	xL	xH	yL	yH	dxL	dxH	dyL	dyH
[Hexadecimal]	1B	57	xL	xH	yL	yH	dxL	dxH	dyL	dyH

[Parameter]  $0 \leq xL, xH, yL, yH, dxL, dxH, dyL, dyH \leq FFh$

[Description]

- Sets the location and the size of print area.  
 Horizontal start point =  $xL + xH \times 256$  / Vertical start point =  $yL + yH \times 256$   
 Horizontal length =  $d \ xL + dxH \times 256$  / Vertical Length =  $dyL + dyH \times 256$
- In STANDARD MODE, this command executes only the internal flagging of printer without affecting printing in STANDARD MODE.
- If the horizontal start point or the vertical start point is out of the printable area, this command will be canceled and the next data will be processed as normal printing data.
- If the horizontal length or the vertical length is 0, this command will be canceled and the next data will be processed as normal printing 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) exceeds the horizontal printable area, the (horizontal printable area - horizontal start point) will be taken as a horizontal length.  
 If the (vertical start point + vertical length) exceeds the vertical printable area, the (vertical printable area - vertical start point) will be taken as a vertical length.
- The basic calculation pitch is calculated by GS P. Once a print area is set, the print area will not be changed even if the basic calculation pitch is changed by GS P. If the calculation leaves a fraction, the fraction will be corrected with the minimum pitch of the mechanism (203DPI) and the remainder will be omitted. The horizontal start point and the horizontal length are calculated with the basic calculation pitch x. The vertical start point and the vertical length are calculated with the basic calculation pitch y.
- The print area, where the horizontal start point is X, the vertical start point is Y, the horizontal length is Dx and the vertical length is Dy, will be as shown in the figure below.
- The horizontal length of printable area for this printer is 432/203 inches and the vertical length is 938/203 inches.



The default is  $xL=xH=yL=yH=0$   
 $dxL=B0, dxH=01, dyL=AA, dyH=03$

<b>CITIZEN</b>	TITLE:	SHEET	29
	PB-32/33	REVISION	29/85
		<b>B</b>	

Specifying the relative printing position [ESC \]

ESC \

[ASCII]	ESC	\	n1	n2
[Decimal]	27	92	n1	n2
[Hexadecimal]	1B	5C	n1	n2

[Parameter]  $0 \leq n1 \leq FFh$   $0 \leq n2 \leq FFh$

[Description]

- Specifies the next print start position in a relative position with respect to the current position. The relative amount (moving amount) is specified as 16 bit, the [specified value × basic calculation pitch] inches.
- The basic calculation pitch is set by GS P.
- “n1” is the low 8 bits of 16 bit data and “n2” is the high 8 bits.
- If the calculation leaves a fraction, the fraction will be corrected with the minimum pitch of the mechanism (203DPI) and the remainder will be omitted. If the next print start position is specified to the right of the current position, specify it as positive (plus). If it is to the left, specify it as negative (minus).  
In case the position is moved to the left by N pitches, specify it as:  
 $n1 + n2 \times 256 = 65536 - N$
- If a position is specified outside the print area, the specification will be ignored.
- In STANDARD MODE, the basic calculation pitch x is used.
- In PAGE MODE,
  - (1) If the start point specified by ESC T is top left or bottom left, the horizontal basic calculation pitch x is used.
  - (2) If the start point specified by ESC T is top right or bottom right, the vertical basic calculation pitch y is used.

<b>CITIZEN</b>	TITLE:	SHEET	30
	PB-32/33	REVISION	30/85
		A	

Aligning the characters [ESC a]

ESC a

[ASCII]           ESC     a     n  
 [Decimal]        27     97     n  
 [Hexadecimal]   1B     61     n

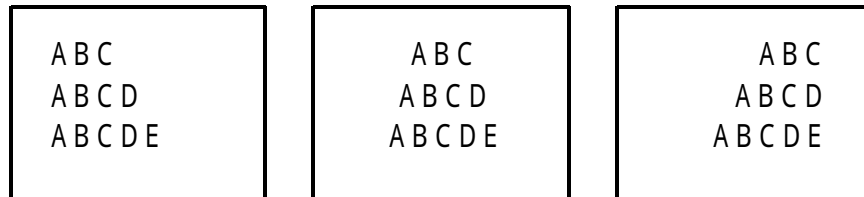
[Parameter]        $0 \leq n \leq 2h, 30h \leq n \leq 32h$

[Description]

- Print data are aligned in the specified position.
- Depending on the “n” value, alignment is carried out as follows:

n	Function
0, 30	Left end alignment
1, 31	Centering
2, 31	Right end alignment

- This command is valid only at the head of line.
- In PAGE MODE, this command executes only the internal flagging of printer without affecting printing in PAGE MODE.  
 Alignment is performed on the portions skipped by HT , ESC \$ or ESC \, too.
- Default is n=0.



Selection of printing sheet [ESC c 0]

ESC c 0

[ASCII]           ESC     c     0     n  
 [Decimal]        27     99     48     n  
 [Hexadecimal]   1B     63     30     n

[Parameter]      1≤n≤3h

[Description]

- Selects the printing sheet (Receipt/Journal).
- Each bit of “n” means as follows:

Bit	Function	Value	
		0	1
0	Journal	Invalid	Valid
1	Receipt	Invalid	Valid
2	Undefined		
3	Undefined		
4	Undefined		
5	Undefined		
6	Undefined		
7	Undefined		

- If the same printing date to Receipt/Journal are cleared with ESC z and both Receipt and Journal are selected for the printing sheet, Receipt will become effective only for the printing sheet in PAGE MODE and printing to Journal will not be executed.
- This command is valid only at the head of line.
- If “n” is defined out of the area, this command will be ignored.
- If the printing sheet in PAGE MODE is selected, this command will be executed prior to ESC L. Once PAGE MODE is selected, this command becomes invalid.
- Default is n=3.

[ASCII]           ESC       c       1       n  
 [Decimal]       27       99       49       n  
 [Hexadecimal]   1B       63       31       n

[Parameter]       1≤n≤3h

[Description]

- Selects the sheet for setting line feed with ESC 2 or ESC 3 and setting the print area with GS L or GS W.
- Each bit of “n” means as follows:

Bit	Function	Value	
		0	1
0	Journal	Invalid	Valid
1	Receipt	Invalid	Valid
2	Undefined		
3	Undefined		
4	Undefined		
5	Undefined		
6	Undefined		
7	Undefined		

- If “n” is defined out of the area, this command will be ignored.
- Default is n=3.

[ASCII]           ESC       c           3       n  
 [Decimal]       27       99       51       n  
 [Hexadecimal]   1B       63       33       n

[Parameter]       1≤n≤FFh

[Description]

- Selects a sensor with which output to PE signal of Centronics parallel I/F is performed.
- Each bit of “n” means as follows:

Bit	Function	Value	
		Hexadecimal	Decimal
0	Journal near-end sensor disabled	00	0
	Journal near-end sensor enabled	01	1
1	Receipt near-end sensor disabled	00	0
	Receipt near-end sensor enabled	02	2
2	Journal end sensor disabled	00	0
	Journal end sensor enabled	04	4
3	Receipt end sensor disabled	00	0
	Receipt end sensor enabled	08	8
4	Undefined		
5	Undefined		
6	Undefined		
7	Undefined		

- Multiple paper end sensors can be selected simultaneously. If multiple sensors are set as enabled, paper end signal will be output when any sensor detects paper end.
- This command is valid only for Parallel Interface specification. This command is ignored on Serial Interface specification.
- When this command is executed, sensors are switched. Therefore, depending on receiving buffer conditions, the command receiving and the paper end sensor are selected.
- If either of bit 0 and bit 1 is 1, a roll paper near-end sensor will be selected as a paper end sensor effective for paper end signal output.
- If either of bit 2 and bit 3 is 1, a roll paper near-end sensor will be selected as a paper end sensor effective for paper end signal output.
- If all sensors are set as disabled, the paper end signal will always output the “paper-in” status.

Selecting the paper sensor valid for print stop [ESC c 4]

ESC c 4

[ASCII]           ESC       c       4       n  
 [Decimal]        27       99       52       n  
 [Hexadecimal]   1B       63       34       n

[Parameter]      1≤n≤FFh

[Description]

- Selects the paper end sensor which helps to stop printing when a paper-out condition occurs.

Bit	Function	Value	
		Hexadecimal	Decimal
0	Journal near-end sensor disabled	00	0
	Journal near-end sensor disabled	01	1
1	Receipt near-end sensor disabled	00	0
	Receipt near-end sensor disabled	02	2
2	Undefined		
3	Undefined		
4	Undefined		
5	Undefined		
6	Undefined		
7	Undefined		

- Printing stops after printing of the current line and paper feed are completed.
- If printing stops, it will become offline.
- If either of bit 0 and bit 1 is 1, a roll paper near-end sensor will be selected as a paper end sensor effective for print stop.

<b>CITIZEN</b>	TITLE:	<b>SHEET REVISION B</b>	35
	<b>PB-32/33</b>		35/85

Enabling/Disabling the panel switches [ESC c 5]

ESC c 5

[ASCII]	ESC	c	5	n
[Decimal]	27	99	53	n
[Hexadecimal]	1B	63	35	n

[Parameter]  $0 \leq n \leq FFh$

[Description]

- Switches enabling/disabling the paper feed switch on the operation panel.
- “n” is valid for the lowest bit “n0”.
  - n=<\*\*\*\*\*0>B enables the paper feed switch.
  - n=<\*\*\*\*\*1>B disables the paper feed switch.
- While a cover is opened, the switch is invalid regardless of specification with this command.
- During the wait state of macro execution, the switch is valid regardless of specification with this command.
- Default is n0=0.

Printing and feeding paper by “n” lines [ESC d]

ESC d

[ASCII]	ESC	d	n
[Decimal]	27	100	n
[Hexadecimal]	1B	64	n

[Parameter]  $0 \leq n \leq FFh$

[Description]

- Prints data in the print buffer and feeds paper by “n” lines.
- Specified lines do not remain.
- The next print start position is set at the head of line.
- If the maximum feeding amount exceeds 40 inches, paper feeding by 40 inches will be executed.

<b>CITIZEN</b>	TITLE:	SHEET	36
	PB-32/33	REVISION B	36/85



Generating the specified pulses [ESC p]

ESC p

[ASCII]	ESC	p	m	n1	n2
[Decimal]	27	112	m	n1	n2
[Hexadecimal]	1B	70	m	n1	n2

[Parameter]  $0 \leq m \leq 1$ ,  $30h \leq m \leq 31h$   $0 \leq n1 \leq FFh$   $0 \leq n2 \leq FFh$

[Description]

- The signals specified by “n1” and “n2” are output to the drawer kick-out connector pin specified by “m”.

m	Connector pin
0. 30h	Drawer kick-out connector pin No. 2
1. 31h	Drawer kick-out connector pin No. 5

- The ON time is  $n1 \times 2ms$ , and the OFF time is  $n2 \times 2ms$ .  
In case of  $n2 < n1$ , the OFF time is  $n1 \times 2ms$  for execution.

<b>CITIZEN</b>	TITLE:  <b>PB-32/33</b>	SHEET REVISION  <b>A</b>	37
			37/85

Full cut [ESC i]

---

ESC i

[ASCII]           ESC     i  
[Decimal]         27     105  
[Hexadecimal]    1B     69

[Parameter]        $1 \leq n \leq FFh$

[Description]

- Executes full cut of Receipt paper.
- This command is effective only at the head of line.

Partial cut [ESC m]

---

ESC m

[ASCII]           ESC     m  
[Decimal]         27     109  
[Hexadecimal]    1B     6D

[Parameter]

[Description]

- Executes partial cut of Receipt paper (leaving one area uncut).
- This command is effective only at the head of line.

<b>CITIZEN</b>	TITLE:	SHEET	38
	<b>PB-32/33</b>	REVISION	38/85
		<b>A</b>	

Selection of printing mode (unprovided) [ESC s]

ESC s

[ASCII]        ESC        s        n  
 [Decimal]     27        115     n  
 [Hexadecimal] 1B        73        n

[Parameter]    0≤n≤FFh

[Description]

- Selects a printing mode.
- Each bit of “n” is as follows:

Bit	Function	Value	
		0	1
0	Divided current-carrying	Block	Chopper
1	Printing speed	High speed	Low speed
2	Undefined		
3	Undefined		
4	Undefined		
5	Undefined		
6	Undefined		
7	Undefined		

• Printing speed

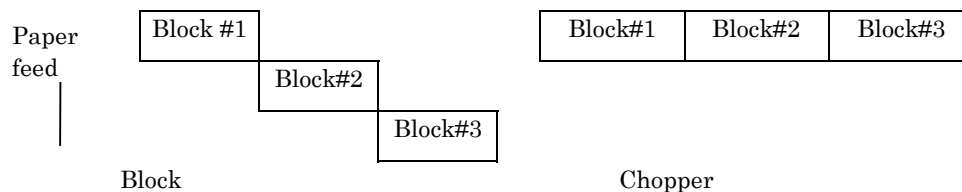
At a low speed, paper feed is stopped and current is passed through the head, resulting in improvement of printing quality, especially in high-density bit image such as halftone.

At a high speed, current is passed through the head during paper feeding, resulting in improvement of throughput.

• Divided current-carrying

On this printer, power consumption is reduced in case of high-density printing. Therefore, printing is performed in a maximum of three blocks (divided current-carrying). If the divided current-carrying is specified to Block, high-speed printing will be enabled. Deviation, however, will occur between blocks.

If the divided current-carrying is specified to Chopper, deviation between blocks will not occur and printing quality will be improved. Throughput, however, will be reduced.



- This command is effective only at the head of line.
- Default is n=0.

\*On CBM262II, this command doesn't function.

<b>CITIZEN</b>	TITLE:	SHEET	39
	PB-32/33	REVISION <b>B</b>	39/85

Selecting the character code table [ESC t]

ESC t

[ASCII]           ESC     t     n  
 [Decimal]        27     116    n  
 [Hexadecimal]   1B     74     n

[Parameter]      0≤n≤6h   n=FFh

[Description]

- Selects the character code table.
- The character code table depending on the value of “n” is as follows:

n	Character code
0	PC437 (USA: Standard Europe)
1	Katakana
2	PC850 (Multilingual)
3	PC860 (Portugal)
4	PC863 (Canada-French)
5	PC865 (Norway)
6	PC858
255	Blank page

- The initial value of “n” is n=0 for PC437.

Status signal of peripheral equipment [ESC u]

ESC u

[ASCII]           ESC     u     n  
 [Decimal]        27     117    n  
 [Hexadecimal]   1B     75     n

[Parameter]    n=0,1

[Description]

- Sends the current status of drawer kick-out connector pin No.3.
- This command is valid only at Serial I/F.
- The status to be sent is 1 byte and its details are as follows:

Bit	Function	Value	
		0	1
0	Level of No.3 pin	“L”	“H”
1	Undefined		
2	Undefined		
3	Undefined		
4	Unused	Fixed at 0	
5	Undefined		
6	Undefined		
7	Undefined		

- If the serial protocol is DTR/DSR, before sending a signal, the printer will check with DSR signal that the host is ready for receiving. If the host is not ready for receiving (DSR is LOW), the printer will wait till it becomes ready for receiving (DSR = HIGH).
- If the serial protocol is XON/XOFF, the printer will not check with DSR signal.

<b>CITIZEN</b>	TITLE:	SHEET	41
	PB-32/33	REVISION	41/85
		A	

Sending the printer status [ESC v]

ESC v

[ASCII]           ESC     v  
 [Decimal]        27     118  
 [Hexadecimal]   1B     76

[Parameter]

[Description]

- Sends the current printer status.
- This command is valid only at Serial I/F.
- The status to be sent is 1 byte and its details are as follows:

Bit	Function	Value	
		0	1
0	Journal near-end sensor	Paper-in	Paper-out
1	Receipt near-end sensor	Paper-in	Paper-out
2	Journal paper end sensor	Paper-in	Paper-out
3	Receipt paper end sensor	Paper-in	Paper-out
4	Unused	Fixed at 0	
5	Download of ANK	No download	Download enabled
6	Download of bit image	No download	Download enabled
7	Unused	Fixed at 0	

- If the serial protocol is DTR/DSR, before sending a signal, the printer will check with DSR signal that the host is ready for receiving. If the host is not ready for receiving (DSR is LOW), the printer will wait till it becomes ready for receiving (DSR = HIGH).
- If the serial protocol is XON/XOFF, the printer will not check with DSR signal.

Specifying/Canceling printing the same date to Receipt/Journal [ESC z]

ESC z

[ASCII]           ESC     z     n  
 [Decimal]        27     122    n  
 [Hexadecimal]   1B     7A     n

[Parameter]       0≤n≤FFh

[Description]

- Specifies/Canceling printing the same data to Receipt/Journal.
- “n” is valid for the lowest bit “n0”.
  - n0=0: Cancels printing the same data.
  - n0=1: Specifies printing the same data.
- This command is effective only at the head of line.
- In PAGE MODE, this command is disabled.
- Unless both Receipt and Journal are selected for the printing sheet, the same printing will not be executed by specification of the same date printing.
- Default is n=0.

<b>CITIZEN</b>	TITLE:	SHEET	42
	PB-32/33	REVISION B	42/85

Specifying/Canceling inverted characters [ESC {]

ESC {

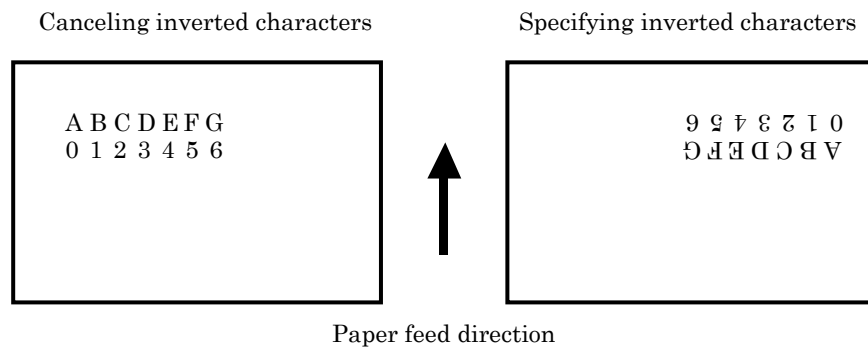
[ASCII]	ESC	{	n
[Decimal]	27	123	n
[Hexadecimal]	1B	7B	n

[Parameter]

[Description]

- Specifies/Canceling inverted characters.
- “n” is valid for the lowest bit.
  - n=0: Canceling inverted characters.
  - n=1: Specifies inverted characters.
- This command is effective only at the head of line.
- In PAGE MODE, this command executes only the internal flagging of printer.
- This command doesn't affect printing in PAGE MODE.
- Default is n=0.

Printing Example)



<b>CITIZEN</b>	TITLE:	SHEET REVISION <b>C</b>	43
	<b>PB-32/33</b>		43/85

Specifying font size [ESC ~ f]

ESC ~ f

[ASCII]	ESC	~	f	m	n
[Decimal]	27	126	102	m	n
[Hexadecimal]	1B	7E	66	m	n

[Parameter] m=0 , 1 or "0" , "1"  
n=0 , 1 , 2 , or "0" , "1" , "2"

[Description]

- m= 0: ANK Font
- n= 0: 24-dot size Font
- 1: Reserve
- 2: 16-dot size Font
- Default is 24 dot size Font.
- Fonts of various sizes are selected for printing.

<b>CITIZEN</b>	TITLE:  <b>PB-32/33</b>	SHEET REVISION  <b>C</b>	44
			44/85



Specifying the print density [ESC ~]

ESC ~

[ASCII]	ESC	~	m	n
[Decimal]	27	126	m	n
[Hexadecimal]	1B	7E	m	n

[Parameter]  $0 \leq m \leq 1$

[Description]

- Specifies the print density.
- This command is for maintenance. Users shouldn't use this command.  
If users use this command, it may damage reliability of the product. This command may be subject to change without notice.
- Specifies Receipt/Journal by "m".  
m=0: Specifies the printing density of Receipt.  
m=1: Specifies the printing density of Journal.
- Specifies the density by "n". The specification is on percentage (%). In case of standard, for example, n=100. The print densities on menu setting correspond to the following "n" values.

Density	"n" value (Decimal)
1	100
2	110
3	120
4	130

- These values may be changed depending on ROM version. Don't set any value except the 140.

<b>CITIZEN</b>	TITLE:	SHEET REVISION <b>C</b>	45
	<b>PB-32/33</b>		45/85

Setting of nonvolatile memory [ESC DEL]

ESC DEL

[ASCII]	ESC	DEL	m	n
[Decimal]	27	127	m	n
[Hexadecimal]	1B	7F	m	n

[Parameter]  $0 \leq m \leq 8$   $0 \leq n \leq FFh$

[Description]

- Set the status at power-on to nonvolatile memory.
- This command is for maintenance. Users shouldn't use this command.  
If users use this command, it may damage reliability of the product. This command may be subject to change without notice.
- The settable contents are the same as the menu setting items.
- The setting contents are stored in nonvolatile memory and they are kept even after power is turned OFF.
- Specifies items by "m" and selects contents by "n".

m	n	m	n
0: Receipt print density	0: Density1 1: Density2 2: Density3 3: Density4	7: C/R operation	0: CR + LF 1: LF 2: Ignoring
1: Journal print density	0: Density1 1: Density2 2: Density3 3: Density4	8: -----	
2: Cover Open	0: Enabling 1: Disabling	9: Reset by INIT	0: Enabling 1: Disabling
3: Auto Cutter	0: Enabling 1: Disabling	10: DSR reset	0: Enabling 1: Disabling
4: Auto Loading	0: Enabling 1: Disabling	11: Error hand shake	0: BUSY 1: Disabling
5: Receipt Paper Near-end	0: Enabling 1: Disabling		
6: Journal Paper Near-end	0: Enabling 1: Disabling		

Note 1) These values may be changed.

<b>CITIZEN</b>	TITLE:	SHEET	46
	PB-32/33	REVISION <b>B</b>	46/85

Writing data into the user NV memory [FS g 1]

FS g 1

[ASCII]	FS	g	1	m	a1	a2	a3	a4	nL	nH	d1..dk
[Decimal]	28	103	49	m	a1	a2	a3	a4	nL	nH	d1..dk
[Hexadecimal]	1C	67	31	m	a1	a2	a3	a4	nL	nH	d1..dk

[Parameter] m=0  
 $0 \leq (a1 + (a2 \times 256) + (a3 \times 65536) + (a4 + 16777216)) \leq 1023$   
 $1 \leq (nL + (nH \times 256)) \leq 1024$   
 $32 \leq d \leq 255$   
 $k = (nL + (nH \times 256))$

[Description]

- Stores data into the user NV memory.
- “m” is fixed at 0.
- a1, a2, a3, a4 specify the start address for storing data at  $(a1 + (a2 \times 256) + (a3 \times 65536) + (a4 + 16777216))$ .
- nL, nH specify the stored data to  $(nL + (nH \times 256))$  bytes.
- “d” denotes the data to be stored.
- “User NV memory” refers to a storage area exclusively for character data secured on nonvolatile memory.  
 In STANDARD MODE, this command is valid only when it is processed at the head of line.  
 In PAGE MODE, this command is invalid.
- If this command is sent while a macro is being defined, the macro definition process will be stopped and the execution of this command will be started.
- 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, or in case of “the storage start address (a1, a2, a3, a4) + the number of stored data (nL, nH)  $\geq 1024$ ”, this command will become invalid and the following data will be processed as normal data.
- At the time of completion of processing of the stored data (d) outside the definition area, processing by this command will be stopped and the next data will be processed as normal data. At this time, the data which has already been processed will be stored into memory.
- Data storage processing executes “overwriting”. Therefore, the data which have been already stored into the area for storage processing are erased.
- If an error occurs during the writing process, the error will be “Memory R/W Error”.
- The data in the user NV memory can be read by FS g.
- The data in the user NV memory is not initialized by execution of ESC @, execution of FS q, resetting or power OFF.

[Caution]

- Frequent use of the “writing into the nonvolatile memory” command (FS g1) may destroy memory. Therefore, the “writing into the nonvolatile memory” command should be used “less than 10 times a day”.
- In some cases, the printer may become BUSY while data is being written into the nonvolatile memory with this command.

While the printer is BUSY, it will stop receiving data and sending data from the host (including real-time commands) will be prohibited.

<b>CITIZEN</b>	TITLE:	SHEET	47
	PB-32/33	REVISION	47/85
		C	

[ASCII]	FS	g	2	m	a1	a2	a3	a4	nL	nH
[Decimal]	28	103	50	m	a1	a2	a3	a4	nL	nH
[Hexadecimal]	1C	67	32	m	a1	a2	a3	a4	nL	nH

[Parameter]      m=0  
 $0 \leq (a1 + (a2 \times 256) + (a3 \times 65536) + (a4 + 16777216)) \leq 1023$   
 $1 \leq (nL + (nH \times 256)) \leq 80$

[Description]

- Reads data to the user NV memory.
- “m” is fixed at 0.
- a1, a2, a3, a4 specify the start address for sending data at  $(a1 + (a2 \times 256) + (a3 \times 65536) + (a4 + 16777216))$ .
- nL, nH specify the number of data to be sent to  $(nL + (nH \times 256))$  bytes.
- “User NV memory” refers to a storage area exclusively for character data secured on nonvolatile memory.
- 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, or in case of “the storage start address (a1, a2, a3, a4) + the number of stored data (nL, nH)  $\geq 1024$ ”, this command will become invalid and the following data will be processed as normal data.
- After the preparation for sending data is completed, the following processes will be executed.
  - (1) The printer state will change from READY to BUSY. If the state has already been set to BUSY, the printer will do nothing.
  - (2) “Header + Data + NUL” will be sent.
  - (3) The printer state will change BUSY from to READY. At this time, if the printer state has already been set to BUSY due to other causes, the printer will do nothing.
- The configuration of “Header + Data + NUL” is as follows:  
 Header: Hexadecimal number = 5F/Decimal number = 95 (1 byte)  
 Data: Data in User NV memory “  $(nL + (nH \times 256))$  bytes”  
 NUL: Hexadecimal number = 00H / Decimal number = 0 (1 byte)
- When the DTR/DSR control is selected, all codes are sent continuously after checking that the host can receive data when the header is sent. If the host cannot receive data, the printer will wait until the host is ready for receiving data.
- When the XON/XOFF control is selected, all codes are sent continuously without checking whether the host can receive data or not. Data that has been sent is always continuous except for XOFF code.
- When parallel interface is used, the size of buffer for data to be sent (buffer that stores all data to be sent except for ASB status) is 99 bytes. Data exceeding 99 bytes will be discarded.
- Data in the user NV memory can be written by using FS g1.
- Depending on the state of receiving buffer, there may be a delay between receiving this command and storing data.
- After the header is sent, all data will be sent without checking whether the host can receive the data or not. Therefore, when this command is used, more than (the number of sending data + 2) bytes of space should be secured in the receiving buffer of the host in order not to fail to receive data.
- While data is being sent, real-time commands (DLE extension command) are ignored. Even if ASB function is selected as enabled, ASB status will not be sent while data are being sent.  
 Accordingly, it is not possible to know any change in printer state by its status during data sending. Users should pay attention to this.

<b>CITIZEN</b>	TITLE:	SHEET	48
	PB-32/33	REVISION B	48/85

[ASCII]	FS	p	n	m
[Decimal]	28	112	n	m
[Hexadecimal]	1C	70	n	m

[Parameter]  $1 \leq n \leq 255$   
 $0 \leq m \leq 3, 48 \leq m \leq 51$

[Description]

- Prints the NV bit images “n” with a mode “m”.

m	Mode	Dot density in vertical direction	Dot density in horizontal density
0, 48	NORMAL MODE	180 DPI	180 DPI
1, 49	DOUBLE WIDTH MODE	180 DPI	90 DPI
2, 50	DOUBLE HEIGHT MODE	90 DPI	180 DPI
3, 51	QUADRUPLE SIZE MODE	90 DPI	90 DPI

- “n” denotes the NV bit image number.
- “m” denotes the NV bit image mode.
- The NV bit image refers to a bit image defined by FS q in the nonvolatile memory and printed by FS p.
- If the specified NV bit image “n” is undefined, this command will be invalid.
- In STANDARD MODE, this command is valid only when there is no data in the print buffer.
- In PAGE MODE, this command is invalid.
- This command doesn't affect any printing modes (i.e. emphasis, double strike, underline, character size, reversed characters, 90°-right turned characters) except inverted printing
- When the print area set by GS L and GS W is not enough for one vertical line of NV bit image, the line alone is dealt with as mentioned below. One vertical line of NV bit image is 1 dot in NORMAL MODE (m=0, 48) and DOUBLE HEIGHT WIDTH (m=2, 50) and 2 dots in DOUBLE WIDTH MODE (m=1, 49) and QUADRUPLE SIZE MODE (m=3,51).
  - The print are is extended to the right side within the limit of print area so that one vertical line of NV bit image can be printed.
  - When a sufficient print area cannot be maintained even after executing (1), the print area is extended to the left side.  
(The left margin is reduced.)
- If the size of bit image exceeding the limit of print area is specified, the data within the limit of print area will be printed, but the data outside the print area will not be printed.
- In NORMAL MODE and DOUBLE WIDTH MODE, regardless of the line feed amount set by ESC 2 and ESC 3, a paper feed of (the height of NV bit image “n”) dots is executed, while in DOUBLE HEIGHT MODE and QUADRUPLE SIZE MODE, a paper feed of (the height of NV bit image “n” ×2) dots is executed.
- After completion of this bit image printing, the head of line will be the next printing position and normal data process will be executed.

<b>CITIZEN</b>	TITLE:	SHEET REVISION	49
	PB-32/33	B	49/85

[ASCII]	FS	q	n	[ xL xH yL yH d1...dk ] 1... [ xL xH yL yH d1...dk ] n
[Decimal]	28	113	n	[ xL xH yL yH d1...dk ] 1... [ xL xH yL yH d1...dk ] n
[Hexadecimal]	1C	71	n	[ xL xH yL yH d1...dk ] 1... [ xL xH yL yH d1...dk ] n

[Parameter]

$1 \leq n \leq 255$   
 $0 \leq xL \leq 255$   
 $0 \leq xH \leq 3$  on condition that  $1 \leq (xL + xH \times 256) \leq 1023$   
 $0 \leq yL \leq 255$   
 $0 \leq yH \leq 1$  on condition that  $1 \leq (yL + yH \times 256) \leq 288$   
 $0 \leq d \leq 255$   
 $k = (xL + xH \times 256) \times (yL + yH \times 256) \times 8$

Total definition area = 2M bits (256k bytes)

[Description]

- Defines the specified NV bit image.
- 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.
- All the previously defined NV bit images are deleted by this command. Therefore, it is not possible to redefine any one of the previously defined multiple data. To make it possible, all data must be resent.
- During the time between the process start by this command and the completion of hardware reset, any mechanical operation (such as initializing a printer head position by opening a cover and paper feeding with switch) cannot be executed.
- NV bit image refers to a bit image that is defined by FS q in the nonvolatile memory and printed by FS p.
- This command is valid only when it is specified at the head of line where STANDARD MODE was selected.
- This command is valid only when it is specified at the head of line where PAGE MODE was selected
- This command becomes valid after 7 bytes of <FS ~ yH> are processed as normal values.
- If the number of data exceeding the remaining capacity of the area defined by (xL, xH, yL, yH) is specified, this command will be invalid.
- "d" denotes a definition data. Bits which correspond to dots to be printed are represented as 1, and bits which correspond to dots not to be printed are represented as 0.
- "n" pieces of NV bit images are defined starting from the number 01H in ascending order. Therefore, the first data group [ xL xH yL yH d1...dk ] becomes NV bit image No.01H. This number is identical to the NV bit image number specified by FS p.
- The definition data of one NV bit image consists of [xL xH yL yH d1...dk]. Therefore, if only one NV bit image is defined, n=1; the data group [xL xH yL yH d1...dk] will be processed once, and ([Data:  $(xL + xH \times 256) \times (yL + yH \times 256) \times 8$  + [header:4]] bytes of nonvolatile memory is used.
- The maximum definition area of this printer is 2M bits (256K bytes). Multiple NV bit image can be defined, but data of bit images of which total size (bit image data + header) exceeds 2M bits (256K bytes) cannot be defined.
- The printer state will be BUSY just before writing data into the nonvolatile memory.
- While this command is being executed, processes of ABS status sending and status detection will not be executed even if ABS function is specified.
- If this command is sent while a macro is still being defined, the macro definition process will be stopped and the process by this command will start.
- Once NV bit images are defined, the NV bit images are not initialized by execution of ESC @, resetting or Power OFF.
- This command executes only definition of NV bit image, and it doesn't start printing. Printing of NV bit image will be executed by FS p.

<b>CITIZEN</b>	TITLE:	SHEET	50
	PB-32/33	REVISION	50/85
		C	

[ASCII]	FS	I	n
[Decimal]	28	73	n
[Hexadecimal]	1C	49	n

[Parameter]      0h≤n≤6h,    30h≤n≤36h

[Description]

- Adjusts the printing density.
 

n=0h, 30h	-3	(Light)	70%
n=1h, 31h	-2	↑	80%
n=2h, 32h	-1	↑	90%
n=3h, 33h	0	(Standard)	100%
n=4h, 34h	+1	↓	110%
n=5h, 35h	+2	↓	120%
n=6h, 36h	+3	(Dark)	130%
- Settings except the above values are ignored.
- Settings are effective by line in STANDARD MODE and by page in PAGE MODE.
- Setting for the range from 100% to 130% are the same as setting by the “ESC~mn” command.

<b>CITIZEN</b>	TITLE:	SHEET	51
	PB-32/33	REVISION A	51/85

[ASCII]	GS	!	n
[Decimal]	29	33	n
[Hexadecimal]	1D	31	n

[Parameter] 0≤n≤FFh  
 on condition that 1≤magnification in vertical direction≤8,  
 1≤magnification in horizontal direction ≤8

[Description]

- Specifies (character sizes magnification in vertical direction/magnification in horizontal direction).

Bit	Function	Value	
		Hexadecimal number	Decimal number
0	Specification of magnification in vertical direction	Refer to the following Table 1	
1			
2			
3			
4	Specification of magnification in horizontal direction	Refer to the following Table 2	
5			
6			
7			

Table 1  
(magnification in horizontal direction)

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

Table 2  
(magnification in horizontal direction)

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

- This command works for all characters except for HRI characters.
- In STANDARD MODE, the vertical direction means a paper feed direction and the horizontal direction means a direction perpendicular to paper feed direction. Therefore, if 90°-right-turned characters are specified, the relationship between vertical and horizontal directions will be reversed.
- In PAGE MODE, the vertical direction means the top-bottom direction of each character and the horizontal direction means the side-to side direction of each character.
- If characters which have different vertical magnifications are contained in the same line, base lines of characters will be aligned.
- Double width and double height of character can be specified/canceled by ESC !, too. But the last processed command becomes effective.
- Default is n=0.



Specifying the absolute vertical position of characters in PAGE MODE [GS \$]

GS \$

[ASCII]	GS	\$	n1	2
[Decimal]	29	36	n1	2
[Hexadecimal]	1D	24	n1	2

[Parameter]      0≤n1≤FFh      0≤n2≤FFh

[Description]

- Specifies the vertical position of characters at the data mapping start position in PAGE MODE as an absolute value measured from the start point. The vertical position will be at a point of [16 bit specification value × basic calculation pitch] inches from the start point.
- “n1” is the low 8 bits of 16 bit data and “n2” is the high 8 bits.
- This command is ignored except when PAGE MODE is selected.
- Any specification of absolute vertical position out of the specified print area is ignored.
- The horizontal position of character at the start point is not moved.
- The start point as a base is specified by ESC T. Depending on the start point, this command executes as follows:
  - (1) If the start point is specified at top left or bottom right, this command will specify the absolute position of paper feed direction (vertical direction of characters). At this time, vertical basic calculation pitch (y) is used.
  - (2) If the start point is specified at top right or bottom left, this command will specify the absolute position in the direction perpendicular to paper feed direction (vertical direction of characters). At this time, horizontal basic calculation pitch (x) is used.
- The basic calculation pitch is a value set by GS P.
- If the calculation leaves a fraction, the fraction will be corrected with the minimum pitch of the mechanism (203DPI) and the remainder will be omitted.

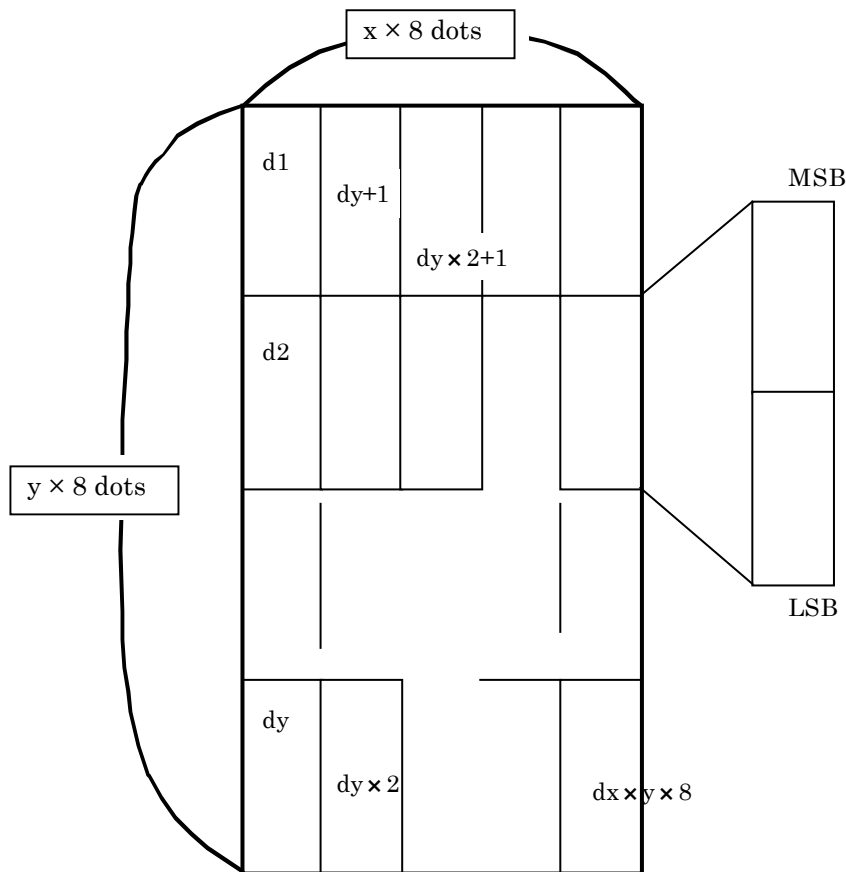
<b>CITIZEN</b>	TITLE:	SHEET	53
	PB-32/33	REVISION	53/85
		A	

[ASCII]	GS	*	n1	n2	dn
[Decimal]	29	42	n1	n2	dn
[Hexadecimal]	1D	2A	n1	n2	dn

[Parameter]  $0 \leq n1 \leq FFh$   $0 \leq n2 \leq 30h$   $n1 \times n2 \leq 600h$   
 Defines the download bit images of dots specified by n1 and n2.

[Description]

- Defines the download bit images of dots specified by n1 and n2.
- The number of dots in horizontal direction is  $n1 \times 8$  and the number of dots in vertical direction is  $n2 \times 8$ .
- "dn" indicates bit image data.
- Once a download bit image is defined, it remains effective until redefinition, execution of ESC @, execution of ESC & or power OFF is conducted.
- A download character and a download bit image cannot be defined simultaneously. If this command is executed, download characters are cleared.
- The bit image data is defined as follows:



[ASCII]	GS	(	A	pL	pH	n	m
[Decimal]	29	40	65	pL	pH	n	m
[Hexadecimal]	1D	28	41	pL	pH	n	m

[Parameter] (pL + (pH × 256)) = 2 (pL=2, pH=0)  
 0 ≤ n ≤ 2, 48 ≤ n ≤ 50  
 1 ≤ m ≤ 3, 49 ≤ n ≤ 51

[Description]

- Executes the specified test printing.
- pL, pH set the number of subsequent parameters to (pL + (pH × 256))bytes.
- “n” specifies the paper for test printing shown in the following table.

n	Kind of paper
0, 48	Basic sheet (Roll paper)
1, 49	Roll paper
2, 50	

- “m” specifies the kind of test printing shown in the following table.

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

- In STANDARD MODE, this command is valid only when it is processed at the head of line.
- In PAGE MODE, this command is ignored.
- If this command is processed while a macro is being defined, the macro definition process will be stopped and the execution of this command will be started.
- After completion of test printing, the printer will reset its hardware. Therefore, download characters, download bit images and macros will be made undefined, reception buffer/print buffer will be cleared and various settings will be returned to the initial values. At this time, DIP switches will be read again.
- Paper cutting is executed at the end of test printing.
- The printer state will be BUSY if process by this command is started.

[ASCII]	GS	/	m
[Decimal]	29	47	m
[Hexadecimal]	1D	2F	m

[Parameter]  $0 \leq m \leq 3h, 30h \leq m \leq 33h$

[Description]

- Prints the download bit image in a mode specified by “m”.
- Modes selected by “m” are as shown in the table below.

m	Mode	Dot density in vertical direction	Dot density in horizontal direction
0, 30h	NORMAL MODE	203DPI	203DPI
1, 31h	DOUBLE WIDTH MODE	203DPI	101DPI
2, 32h	DOUBLE HEIGHT MODE	101DPI	203DPI
3, 33h	QUADRUPLE SIZE MODE	101DPI	101DPI

- If data exist in the print buffer, this command will be ignored.
- If a download bit image has not been defined, this command is ignored.
- The download bit image for the portion exceeding the length of one line is not printed.
- If the print area width specified by GS L, GS W is less than the minimum horizontal width of bit image mode (1 dot in NORMAL MODE and DOUBLE HEIGHT MODE, 2 dots in DOUBLE WIDTH MODE and QUADRUPLE SIZE MODE), the following processes will be executed only for the line.

- (1) The print area is extended to the right within the printable area so that it becomes equal to the minimum horizontal width of bit image mode
- (2) If sufficient print area cannot be secured after execution of the process mentioned in (1), the print area will be extended to the left. (The left margin will be reduced.)

<b>CITIZEN</b>	TITLE:	SHEET	56
	PB-32/33	REVISION	56/85
		A	

Starting/Ending the macro definition [GS :]

GS :

[ASCII] GS :  
 [Decimal] 29 58  
 [Hexadecimal] 1D 3A

[Parameter]

[Description]

- Specifies starting/ending of macro definition.
- Macro is a single instruction into which existing printer commands and printing data are compiled. By using macro, repeated printings and commands which are used frequently can be executed efficiently.
- ESC @ can be included into the definition content.
- The maximum data available for macro definition is 2048 bytes.
- Even during execution of macro definition, printing can be executed.

Specifying/Canceling the black/white reverse printing [GS B]

GS B

[ASCII] GS B n  
 [Decimal] 29 66 n  
 [Hexadecimal] 1D 42 n

[Parameter] 0≤n≤255

[Description]

- Specifying/Canceling the black/white reverse printing.
- “n” is effective for the lowest bit “n0”. “n0” is as follows:  
 n = <\*\*\*\*\*0>: Canceling (Cancels the black/white reverse printing.)  
 n = <\*\*\*\*\*1>: Specifying (Specifies the black/white reverse printing.)
- The black/white reverse printing works on internal characters and download characters.
- The black/white reverse printing also works on the right space of character set by ESC SP.
- This command doesn't affect bit image, download bit image, bar code, HRI characters and the parts skipped by HT, ESC \$, ESC \.
- This command doesn't affect the parts skipped by ESC \.
- This command doesn't affect the space between lines.
- Specification of black/white reverse printing takes precedence over specification of underline. Therefore, even if underline has been specified, underline is not be attached to black/white inverted characters. The state of underline setting, however, remains unchanged.
- Default is n=0.

<b>CITIZEN</b>	TITLE:	SHEET	57
	PB-32/33	REVISION	57/85
		A	

Selection of printing position of HRI characters [GS H]

GS H

[ASCII] GS H n  
 [Decimal] 29 72 n  
 [Hexadecimal] 1D 48 n

[Parameter]  $0 \leq n \leq 3$ ,  $30h \leq n \leq 33h$

[Description]

- Selects the printing position of HRI characters for printing bar codes.
- “n” is as follow:

n	Printing position
0, 48h	No printing
1, 49h	Above the bar code
2, 50h	Below the bar code
3, 51h	Above and below the bar code (both)

- HRI characters are printed in the font specified by GS “f”.
- Default is n=0.

<b>CITIZEN</b>	TITLE:  <b>PB-32/33</b>	SHEET REVISION  <b>A</b>	58
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[ASCII]	GS	I	n
[Decimal]	29	73	n
[Hexadecimal]	1D	49	n

[Parameter]  $1 \leq n \leq 3$ ,  $49 \leq n \leq 51$ ,  $65 \leq n \leq 69$

[Function]

- Sends the specified printer ID.

n	Type of printer ID	Specification	Value (Hex.)
1, 49	Model ID	* * * * *	60
2, 50	Type ID	Refer to Table "Type ID".	
3, 51	ROM version	As per ROM version	
65	Firmware version	As per firmware version	
66	Maker name	CBM	
67	Model name	CBM262-2	
68	Serial number	As per serial number	

Table "Type ID"

Bit	Function	Hex.	Decimal
0	Not equipped for 2 byte code	00	0
	Equipped for 2 byte code	01	1
1	Equipped with auto cutter	02	2
2	Direct connection of customer display	00	0
3	Without MICR reader	00	0
4	Unused	00	0
5	Undefined	-	-
6	Undefined	-	-
7	Unused	00	0

- When Serial Interface is being used, under DTR/DSR control, the printer sends the printer ID after checking that the host is ready to receive.  
If the host is not ready to receive, the printer will wait until the host becomes ready to receive. Under XON/XOFF control, the printer sends the printer ID without checking whether the host is ready to receive or not.
- This command is executed at the time of mapping of the receive buffer. Therefore, depending on the state of receive buffer, a delay between command receiving and printer ID sending may occur.
- By specifying ( $1 < n < 3$ ,  $49 < n < 51$ ), one byte of printer ID will be sent.
- If ASB is enabled by GS a, it is necessary to discriminate between the printer ID due to this command and the status due to ASB. For the discriminating method.
- By specifying ( $65 < n < 69$ ), the following printer information will be sent.  
Header : Hexadecimal=5FH/Decimal=95 (1 byte)  
Data : Printer information  
NUL : Hexadecimal : 00H/Decimal = 0 (1 byte)

After data processing is completed, the following process will be executed.

- (1) The process of (READY  $\square$  BUSY) is executed. At this time, if the printer state has already been BUSY, the printer will do nothing.
- (2) The sending process of "Header + Data + NULL" is executed.
- (3) The process of (BUSY  $\square$  READY) is executed. At this time, if the printer state has already been set to BUSY due to other causes, the printer will do nothing.

<b>CITIZEN</b>	TITLE:	SHEET	59
	PB-32/33	REVISION B	59/85

Setting the left margin [GS L]

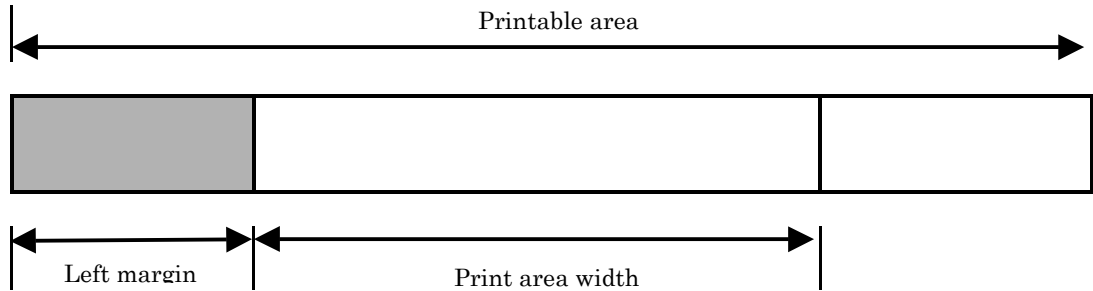
GS L

[ASCII]           GS       L       n1   n2  
 [Decimal]        29       76       n1   n2  
 [Hexadecimal]   1D       4C       n1   n2

[Parameter]       0≤n1≤FFh   0≤n2≤FFh

[Description]

- Sets the left margin specified by n1 and n2.
- The left margin is “(n1+n2 × 256) × basic calculation pitch”.



- This command is effective only when it is entered at the head of line.
- In PAGE MODE, this command executes only the internal flagging operation of printer and doesn't affect printing in PAGE MODE.
- The maximum settable left margin is equal to the print area in horizontal direction. If the left margin is specified to the value greater than the maximum value, it will be set to the maximum value.
- The left margin can be set separately for RECEIPT and JOURNAL. But if printing of the same data to RECEIPT and JOURNAL is specified, the left margin set for JOURNAL will be ignored and the left margin set for RECEIPT will be effective.
- Default is n1=0, n2=0.

<b>CITIZEN</b>	TITLE:	SHEET REVISION <b>B</b>	60
	PB-32/33		60/85



[ASCII] GS M n  
 [Decimal] 29 77 n  
 [Hexadecimal] 1D 4D n

[Parameter]  $0 \leq n \leq FFh$ , on condition that bit 1, 2, 4, 5, 6 should be 0.

[Description]

Bit	Function	Value	
		0	1
0	Reduced character printing in vertical direction	Cancel	Specify
1	Unused	0	Fixed
2	Unused	0	Fixed
3	Undefined		
4	Unused	0	Fixed
5	Unused	0	Fixed
6	Unused	0	Fixed
7	Undefined		

- This command is effective for all characters except for HRI characters.
- In STANDARD MODE, characters are reduced in the paper feed direction.
- In PAGE MODE, regardless of print direction selected by ESC T, characters are reduced in the vertical direction of each character.
- If reduced character printing is specified, underline will not be attached.
- Default is n=0.

<b>CITIZEN</b>	TITLE:	SHEET REVISION <b>A</b>	61
	<b>PB-32/33</b>		61/85

Setting the basic calculation pitch [GS P]

GS P

[ASCII]	GS	P	x	y
[Decimal]	29	80	x	y
[Hexadecimal]	1D	50	x	y

[Parameter]  $0 \leq x \leq FFh$   $0 \leq y \leq FFh$

[Description]

- Sets the horizontal basic calculation pitch to (1/x) inches and the vertical basic calculation pitch to (1/y) inches.
  - In case of x=0, the horizontal basic calculation pitch is reverted to the initial value.
  - In case of y=0, the vertical basic calculation pitch is reverted to the initial value.
- The horizontal direction refers to the direction perpendicular to paper feed direction. The vertical direction refers to paper feed direction.
- In STANDARD MODE, the following parameters are used regardless of the orientation of character (e.g. inverted or 90°-turned),.
  - Command using x : ESC SP, ESC \$, ESC \, FS S, GS L, GS W
  - Command using y : ESC 3, ESC J
- In PAGE MODE, depending on the orientation of character, the following parameters are used.
  - In case the start point specified by ESC T is set at top left or bottom right (characters are mapped in the direction perpendicular to paper feed)
    - Command using x : ESC SP, ESC \$, ESC W, ESC \, FS S
    - Command using y : ESC 3, ESC J, ESC W, GS \$, GS \
  - In case the start point specified by ESC T is set at bottom left or top right ( characters are mapped in the paper feed direction)
    - Command using x : ESC 3, ESC J, ESC W, GS \$, GS \
    - Command using y : ESC SP, ESC \$, ESC W, ESC \, FS S
- Default is x=203, y=203.

<b>CITIZEN</b>	TITLE:	SHEET	62
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		A	

[ASCII]	GS	V	m	- (1)
[Decimal]	29	86	m	
[Hexadecimal]	1D	56	m	
[ASCII]	GS	V	m n	- (2)
[Decimal]	29	86	m n	
[Hexadecimal]	1D	56	m n	

[Parameter]

- (1) m=0,1 m=48,49
- (2) m=65, 66 0h≤n≤255

[Description]

- Executes the specified paper cutting.

n1	Function
0, 48	Full cut
1, 49	Partial cut (leaving one portion uncut)
65	Paper feed by (cut position + n × basic calculation pitch) and full cut
66	Paper feed by (cut position + n × basic calculation pitch) and partial cut (leaving one portion uncut)

In case of (1)

- In case of m=0, full cut is executed.
- In case of m=1, partial cut is execute.

In case of (2)

In case of n=0, after paper is fed to the cut position, paper is cut.

In case of n≠0, after paper is fed to the position exceeding the cut position by (n2× basic calculation pitch) inches, paper is cut.

- The basic calculation pitch is set by GS P.
- The paper feed amount is calculated with the vertical basic calculation pitch (y). If the calculation leaves a fraction, the fraction will be corrected with the minimum pitch of the mechanism and the remainder will be omitted.

<b>CITIZEN</b>	TITLE:  <b>PB-32/33</b>	SHEET REVISION  <b>B</b>	63
			63/85

Setting the print area width [GS W]

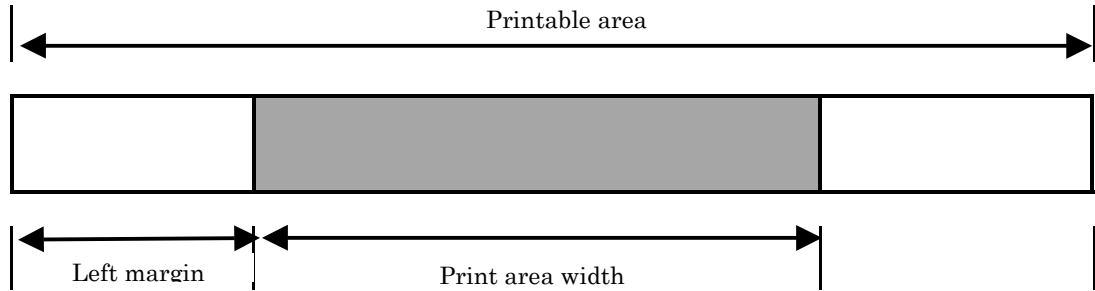
GS W

[ASCII]	GS	W	n1	n2
[Decimal]	29	87	n1	n2
[Hexadecimal]	1D	57	n1	n2

[Parameter]  $0 \leq n1 \leq FFh$   $0 \leq n2 \leq FFh$

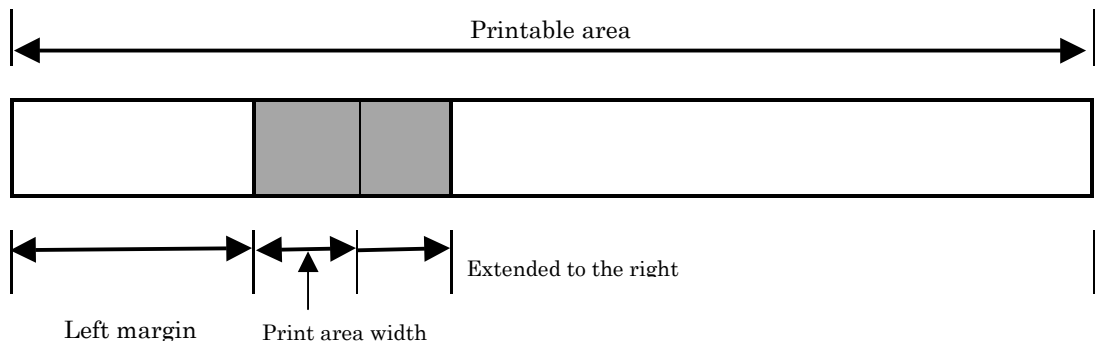
[Description]

- Sets the print area width specified by n1 and n2.
- The print area width will be “(n1 + n2 × 256) × basic calculation pitch” inches.



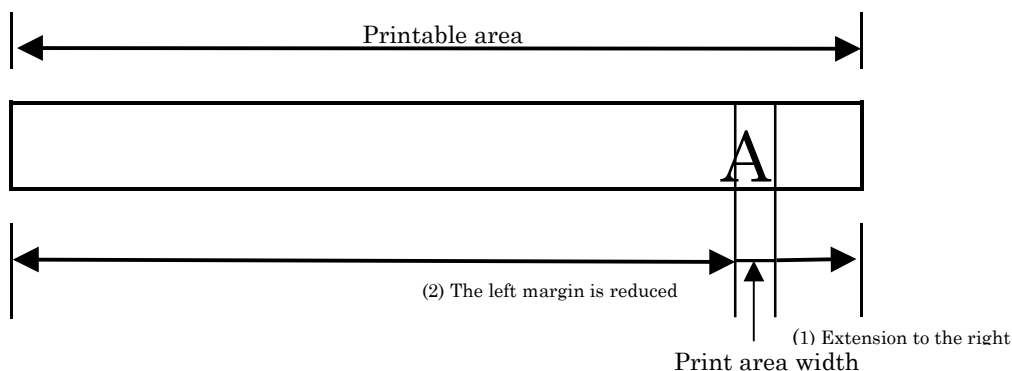
- In STANDARD MODE, this command is effective only when it is entered at the head of line.
- In PAGE MODE, this command executes only the internal flagging operation of printer.
- This command doesn't affect printing in PAGE MODE.
- If the value exceeding the printable area for one line is specified, the entire area except the left margin will be set as the printable area width.
- The print area width is set to the setting sheet selected as enabled by ESC c.
- The basic calculation pitch is set by GS P. Once the print area width is set, it will not be changed, even 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. If the calculation leaves a fraction, the fraction will be corrected with the minimum pitch of the mechanism and the remainder will be omitted.
- In case the first character is mapped at the head of line, if the print area width is smaller than the horizontal width of the character to be mapped (including the right spacing), the following processes will be executed only for that line.

(1) The print area is extended to the right within the printable area so that the character is accommodated in the area.



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			<b>B</b>	64/85

(2) If sufficient area cannot be provided after the process of (1), the right space will be reduced.



(3) If sufficient area cannot be provided after the process of (2), the left space will be reduced.

☛ In case of bit image mapping, if the print area width is smaller than the minimum horizontal width of bit image, the following processes will be executed only for that line.

(1) The print area is extended to the right within the printable area so that it becomes equal to the minimum horizontal width of bit image.

(2) If sufficient area cannot be provided after the process of (1), the print area will be extended to the left. (The left margin will be reduced.)

☛ The minimum width of each bit image for the process of extending the print area width is as follows:

☛ Bit image (ESC \*): Single density = 2 dots/ Double density = 1 dot

☛ Download bit image (GS /): DOUBLE WIDTH MODE, QUADRUPLE MODE = 2 dots

NORMAL MODE, DOUBLE HEIGHT MODE = 1 dot

☛ NV bit image mode (FS p): DOUBLE WIDTH MODE, QUADRUPLE MODE = 2 dots

NORMAL MODE, DOUBLE HEIGHT MODE = 1 dot

☛ Raster image mode (GS v0): DOUBLE WIDTH MODE, QUADRUPLE MODE = 2 dots

NORMAL MODE, DOUBLE HEIGHT MODE = 1 dot

☛ The print area width can be set separately for RECEIPT and JOURNAL. If printing of the same data to RECEIPT and JOURNAL is specified, the print area width set for JOURNAL will be ignored and the print area width set for RECEIPT will be effective.

☛ Default is nL=B0h, nH=1h.

<b>CITIZEN</b>	TITLE:	SHEET	65
	PB-32/33	REVISION B	65/85

Specifying the relative vertical position of character in PAGE MODE [GS \ ]

GS \

[ASCII] GS \ n1 n2  
 [Decimal] 29 92 n1 n2  
 [Hexadecimal] 1D 5C n1 n2

[Parameter]  $0 \leq n1 \leq FFh$   $0 \leq n2 \leq FFh$

[Description]

- Specifies the relative vertical position of character in the data mapping start position in PAGE MODE by the relative position with respect to the current position. The next data start position will be set at the position of (16 bit specification value × basic calculation pitch) inches away from the current position.
- Except for PAGE MODE, this command is ignored.
- The basic calculation pitch is a value set by GS P.
- n1 is the low 8 bits of 16 bits and n2 is the high 8 bits.
- If the calculation leaves a fraction, the fraction will be corrected with the minimum pitch (203DPI) of the mechanism and the remainder will be omitted.
- If a new position is specified to a position located beneath the current position with respect to a character, it should be specified as positive (+). If a new position is specified to a position located above the current position, it should be specified as negative (-).
- The negative setting value is calculated with the following expression if a position is moved upward by N pitches, for example.  

$$n1 + n2 \times 256 = 65536 - N$$
- The following processes are executed depending on the start point of ESC T.  
 If the start point is specified at top left or bottom right, the relative position will be set to the paper feed direction.  
 At this time, the vertical basic calculation pitch (y) is used.  
 If the start point is specified at top right or bottom left, the relative position will be set to the direction perpendicular to the paper feed direction.  
 At this time, the horizontal basic calculation pitch (x) is used.
- The basic calculation pitch is set by GS P.

<b>CITIZEN</b>	TITLE:  <b>PB-32/33</b>	SHEET REVISION  <b>A</b>	66
			66/85

Execution of macro [GS ^]

GS ^

[ASCII]	GS	^	n1	n2	n3
[Decimal]	29	94	n1	n2	n3
[Hexadecimal]	1D	5E	n1	n2	n3
[Parameter]	$0 \leq n1 \leq FFh$	$0 \leq n2 \leq FFh$	$0 \leq n3 \leq 1$		

[Description]

- Executes the defined macro.
  - Contents of n1, n2 and n3 are as follows:
  - With the following specification, printing and commands which are frequently used can be executed efficiently.
    - n1 : The number of times of macro execution
    - n2 : Waiting time on macro execution
  - Waiting time of 100msec is given per one execution.
  - n3 : Macro execution mode
    - n3 = 0 : Specifies continuous execution.  
Macro is executed n1 times continuously at the time interval specified by n2.
    - n3 = 1 : Specifies execution by the paper feed switch.
- After waiting for the time specified by n2, ERROR LED flashes till the paper feed switch for RECEIPT or JOURNAL is pressed.
- If the switch is pressed, the macro will be executed. This action is repeated n1 times.
- If this command is entered during macro definition, the macro definition will be suspended. At this time, the defined content will be cleared.
- If the macro is undefined or n1=0, the printer will do nothing.
- In case of n3=1, paper feed cannot be executed by the paper feed switch.
- During the waiting time of macro, ERROR LED is flashing.

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[ASCII] GS a n  
 [Decimal] 29 97 n  
 [Hexadecimal] 1D 61 n

[Parameter]  $0 \leq n \leq FFh$

[Description]

- Selects the status to be addressed by Automatic Status Back (ASB : Automatic Status Back)

Bit	Status to be addressed by ASB	Value	
		Hex.	Decimal
0	Status of Drawer kick-out connector No. 3 pin = Disabled	00	0
	Status of Drawer kick-out connector No. 3 pin = 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	-	-

- If any one of statuses is enabled, the status at the time of execution of this command will be sent. After that, the status will be sent each time an enabled status changes.
- If all statuses are disabled, the ASB function will be disabled.
- The 4 byte statuses shown in the tables below are sent without checking that the host is ready to receive or busy.
- The 4 byte statuses are continuous except XOFF code.

The 1st byte (Printer information)

Bit	Status	Value	
		Hex.	Decimal
0	Unused	00	0
1	Unused	00	0
2	Status of Drawer kick-out connector No. 3 pin = "L"	00	0
	Status of Drawer kick-out connector No. 3 pin = "H"	04	4
3	Online status	00	0
	Offline status	08	8
4	Unused	10	16
5	Lever closed	00	0
	Lever opened	20	32
6	Not in the state of paper feeding by the paper feed switch	00	0
	In the state of paper feeding by the paper feed switch	40	64
7	Unused	00	0



The 2nd byte (Error occurrence information)

Bit	Status	Value	
		Hex.	Decimal
0	Undefined	00	0
1	Undefined	00	0
2	Undefined	00	0
3	No occurrence of auto cutter error	00	0
	Occurrence of auto cutter error	08	8
4	Unused	00	0
5	No occurrence of unrecoverable error	00	0
	Occurrence of unrecoverable error	20	32
6	No occurrence of auto recovery error	00	0
	Occurrence of auto recovery error	40	64
7	Unused	00	0

The 3rd byte

(Paper sensor information For single)

Bit	Status	Value	
		Hex.	Decimal
0, 1	Roll paper near-end = Paper-in	00	0
	Roll paper near-end = Paper-out	03	3
2, 3	Roll paper end = Paper-in	00	0
	Roll paper end = Paper-out	0C	12
4	Unused	00	0
5	Undefined	-	-
6	Undefined	-	-
7	Unused	00	0

(Paper sensor information For two stations)

Bit	Status	Value	
		Hex.	Decimal
0	Journal near-end = Paper-in	00	0
	Journal near-end = Paper-out	01	1
1	Receipt near-end =Paper-in	00	0
	Receipt near-end =Paper-out	02	3
2	Journal end =Paper-in	00	0
	Journal end =Paper-out	04	4
3	Receipt end =Paper-in	00	0
	Receipt end =Paper-out	08	8
4	Unused	00	0
5	Undefined	-	-
6	Undefined	-	-
7	Unused	00	0

The 4th byte (Paper sensor information)

Bit	Status	Value	
		Hex.	Decimal
0	Undefined	–	–
1	Undefined	–	–
2	Undefined	–	–
3	Undefined	–	–
4	Unused	00	0
5	Undefined	–	–
6	Undefined	–	–
7	Unused	00	0

- Default: When error hand shake of menu setting is BUSY, n=0
- Default: When error hand shake of menu setting is INVALID, n=2

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Specifying/Canceling smoothing [GS b]

GS b

[ASCII]	GS	b	n
[Decimal]	29	98	n
[Hexadecimal]	1D	62	n

[Parameter]  $0 \leq n \leq 255$

[Description]

- Specifies/Canceling smoothing.
  - In case of  $n = \langle \text{*****0} \rangle$  B, smoothing is canceled.
  - In case of  $n = \langle \text{*****1} \rangle$  B, smoothing is set.
- “n” is effective only for the lowest bit.
- Smoothing works on internal characters, download characters and external characters.
- Even if smoothing is specified, when either of vertical magnification and horizontal magnification is one time, smoothing will not be executed.
- Default is  $n=0$ .

Selection of font for HRI characters [GS f]

GS f

[ASCII]	GS	f	n
[Decimal]	29	102	n
[Hexadecimal]	1D	66	n

[Parameter]  $0 \leq n \leq 1, 48 \leq n \leq 49$

[Description]

- Selects the font for HRI characters in printing bar code.
- “n” is as follows:

n	Font
0, 48h	Font A
1, 49h	Font B

- HRI characters are printed at the position specified by GS H.
- Default is  $n=0$ .

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			<b>B</b>	71/85

Selection of height of bar code [GS h]

GS h

[ASCII]	GS	h	n
[Decimal]	29	104	n
[Hexadecimal]	1D	68	n

[Parameter]  $1 \leq n \leq 255$

[Description]

- Specifies the height of bar code.
- “n” denotes the number of dots in vertical direction.
- Default is n=162.

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[ASCII]	GS	k	n	Ds	NULL . . . . .	(1)
[Decimal]	29	107	n	Ds	NULL . . . . .	(1)
[Hexadecimal]	1D	6B	n	Ds	NULL . . . . .	(1)
[ASCII]	GS	k	n	S Ds	. . . . .	(2)
[Decimal]	29	107	n	S Ds	. . . . .	(2)
[Hexadecimal]	1D	6B	n	S Ds	. . . . .	(2)

[Parameter] In case of (1),  $0 \leq n \leq 6$ . In case of (2),  $41h \leq n \leq 49h$

[Description]

- Selects the bar code system and prints it.
- The next printing start position will be the head of line.
- “n” is as follows:

In case of (1)

n	Bar code system	Definition range of “s”	Definition range of D
0	UPC-A	$11 \leq s \leq 12$	$48 \leq D \leq 57$
1	UPC-E	$11 \leq s \leq 12$	$48 \leq D \leq 57$
2	JAN13(EAN13)	$12 \leq s \leq 13$	$48 \leq D \leq 57$
3	JAN8(EAN8)	$7 \leq s \leq 8$	$48 \leq D \leq 57$
4	CODE39	$1 \leq s$	$48 \leq D \leq 57, 65 \leq D \leq 90$ 32, 36, 37, 43, 45, 46, 47
5	ITF	$1 \leq s$ (Even number)	$30h \leq D \leq 39h$
6	CODEBAR	$1 \leq s$	$30h \leq D \leq 39h, 41h \leq D \leq 5Ah$ 24h, 2Bh, 2Dh, 2Eh, 2Fh, 3Ah

In case of (2)

n	Bar code system	Definition range of “s”	Definition range of D
65	UPC-A	$11 \leq s \leq 12$	$48 \leq D \leq 57$
66	UPC-E	$11 \leq s \leq 12$	$48 \leq D \leq 57$
67	JAN13(EAN13)	$12 \leq s \leq 13$	$48 \leq D \leq 57$
68	JAN8(EAN8)	$7h \leq s \leq 8h$	$48 \leq D \leq 57$
69	CODE39	$1 \leq s \leq 255$	$48 \leq D \leq 57, 65 \leq D \leq 90$ 32, 36, 37, 43, 45, 46, 47
70	ITF	$1 \leq s \leq 255$ (Even number)	$48h \leq D \leq 57$
71	CODEBAR	$1 \leq s \leq 255$	$48 \leq D \leq 57, 65 \leq D \leq 68$ 36, 43, 45, 46, 47, 58
72	CODE93	$1 \leq s \leq 255$	$0 \leq D \leq 127$
73	CODE128	$2 \leq s \leq 255$	$0 \leq D \leq 127$

In case of (1) :

This command ends with a NULL code.

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

For JAN 13, when 13 bytes of bar code data is entered, the bar code will be printed and the subsequent data will be handled as normal data.

For JAN 8, when 8 bytes of bar code data is entered, the bar code will be printed and the subsequent data will be handled as normal data.

The number of data of ITF bar code must be an even number. If the number of data be an odd number, the last datum will be ignored.

In case of (2) :

- ☞ S denotes the number of data and “n” bytes of subsequent data will be processed as bar code data.
- ☞ If S is out of the definition range, the command process will be aborted and the subsequent data will be handled as normal data.

In case of STANDARD MODE

- ☞ If D is out of the definition range, only paper feed will be executed and the subsequent data will be handled as normal data.  
If the horizontal width of bar code exceeds the print area of one line, only paper feed will be executed without printing of bar code.  
Paper is fed by the amount of height of bar code (including HRI characters when HRI character printing is specified) regardless of the line feed amount set by ESC 3, ESC 2.  
If data exists in the print buffer, this command will be ignored.  
If the character code Dn is an unprintable character, the subsequent data will be handled as normal data.
- ☞ After printing the bar code, the next printing start position will be set at the head of line.  
This command doesn't affect the printing modes (emphasis printing, double printing, underline, character size) except for inverted printing.

In case of PAGE MODE

Only mapping of bar code is executed and printing is not executed. After completion of mapping of bar code, the dot next to the last data of bar code will be the next data mapping start position.  
If D is out of the definition range, the command process will be aborted and the subsequent data will be handled as normal data.  
At this time, the data mapping start position is not moved.  
If the horizontal width of bar code exceeds the print area, the data mapping start will be moved to the left end outside the print area without printing of bar code.

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		<b>B</b>	

[ASCII]	GS	r	n
[Decimal]	29	114	n
[Hexadecimal]	1D	72	n

[Parameter]  $1 \leq n \leq 2h$ ,  $49 \leq n \leq 50$

[Description]

- Sends the specified status.
  - n=1, 49 : Sends the paper sensor status.
  - n=2, 50 : Sends the drawer kick-out connector status.
- When Serial Interface is used,
  - In case of DTR/DSR control ..... The printer sends the status after checking that the host is ready to receive.  
If the host isn't ready to receive, the printer will wait until it becomes ready to receive.
  - In case of XON/XOFF control ..... The printer sends the status without checking whether the host is ready to receive or not.

Paper sensor status (n=1, 49)

(1) For Single

Bit	Status	Value	
		Hex.	Decimal
0, 1	Roll paper near-end = Paper-in	00	0
	Roll paper near-end = Paper-out	03	3
2, 3	Roll paper end = Paper-in	00	0
	Roll paper end = Paper-out	(0C)	(12)
4	Unused	00	0
5	Undefined	-	-
6	Undefined	-	-
7	Unused	00	0

(2) For two stations

Bit	Status	Value	
		Hex.	Decimal
0	Journal near-end = Paper-in	00	0
	Journal near-end = Paper-out	01	1
1	Receipt near-end = Paper-in	00	0
	Receipt near-end = Paper-out	02	3
2	Journal end = Paper-in	00	0
	Journal end = Paper-out	04	4
3	Receipt end = Paper-in	00	0
	Receipt end = Paper-out	08	8
4	Unused	00	0
5	Undefined	-	-
6	Undefined	-	-
7	Unused	00	0

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

Bit	Printer status	Value	
		Hex.	Decimal
0	Status of Drawer kick-out connector No.3 pin "L"	00	0
	Status of Drawer kick-out connector No.3 pin "H"	01	0
1	Undefined	-	-
2	Undefined	-	-
3	Undefined	-	-
4	Unused	00	0
5	Undefined	-	-
6	Undefined	-	-
7	Unused	00	0

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[ASCII]	GS	v	0	m	xL	xH	yL	yH	d1...dk
[Decimal]	29	118	48	m	xL	xH	yL	yH	d1...dk
[Hexadecimal]	1D	76	30	m	xL	xH	yL	yH	d1...dk

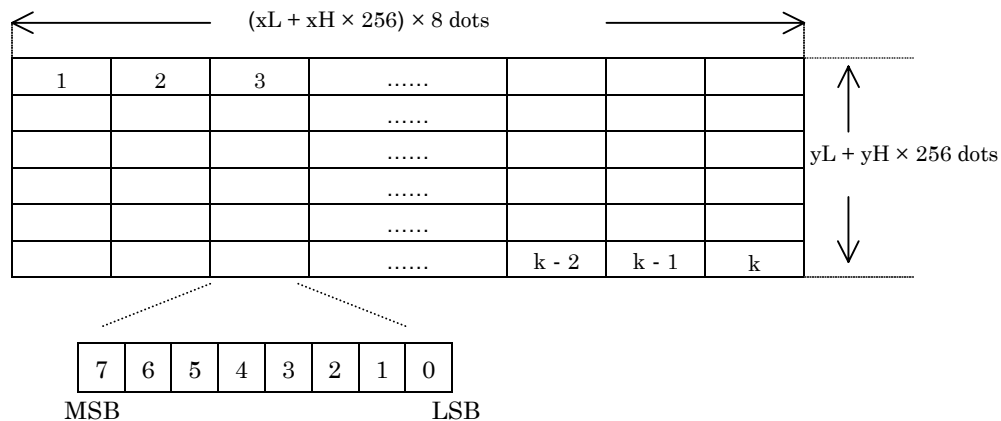
[Parameter]  $0 \leq m \leq 3, 30h \leq m \leq 33h$   
 $0 \leq xL \leq FFh$   
 $0 \leq xH \leq FFh$ , on condition that  $1 \leq (xL + xH \times 256) \leq 128$   
 $0 \leq yL \leq FFh$   
 $0 \leq yH \leq 8h$ , on condition that  $1 \leq (yL + yH \times 256) \leq 4095$   
 $k = (xL + xH \times 256) \times (yL + yH \times 256)$ , on condition that  $k \neq 0$

[Description]

- Prints raster bit images in mode “m”.

m	Mode	Dot density in vertical direction	Dot density in horizontal direction
0, 48	NORMAL MODE	203dpi	203dpi
1, 49	DOUBLE WIDTH MODE	203dpi	101dpi
2, 50	DOUBLE HEIGHT MODE	101dpi	203dpi
3, 51	QUADRUPLE SIZE MODE	101dpi	101dpi

- xL, xH specify the number of data in horizontal direction to  $(xL + xH \times 256)$  bytes.
- yL, yH specify the number of data in vertical direction to  $(yL + yH \times 256)$  bytes.
- In STANDARD MODE, this command is effective only when there is no data in the print buffer.
- If the print area width set by GS L, GS W is smaller than the minimum width, the print area only for the line will be extended to the minimum value. The minimum value is 1 dot in NORMAL MODE and DOUBLE HEIGHT MODE, and 2 dots in DOUBLE WIDTH MODE and QUADRUPLE MODE.
- Data which is out of the print area is read and discarded in units of dot.
- By the horizontal tab setting, the absolute position and relative position specifying, and the left margin setting, the printing start position of raster bit image can be specified arbitrarily. The print start position is a multiple of 8.
- ESC a (Aligning the characters) is effective for the raster bit image.
- If this command is executed during macro definition, the macro definition will be suspended, and the process of this command will be started. At this time, the macro will become undefined.
- “d” denotes a definition data. The bit corresponding to the dot to be printed is 1 and the bit corresponding to the dot not to be printed is 0.



Selection of bar code width size (magnification) [GS w]

GS w

[ASCII]	GS	w	n
[Decimal]	29	119	n
[Hexadecimal]	1D	77	n

[Parameter]  $2 \leq n \leq 6h$

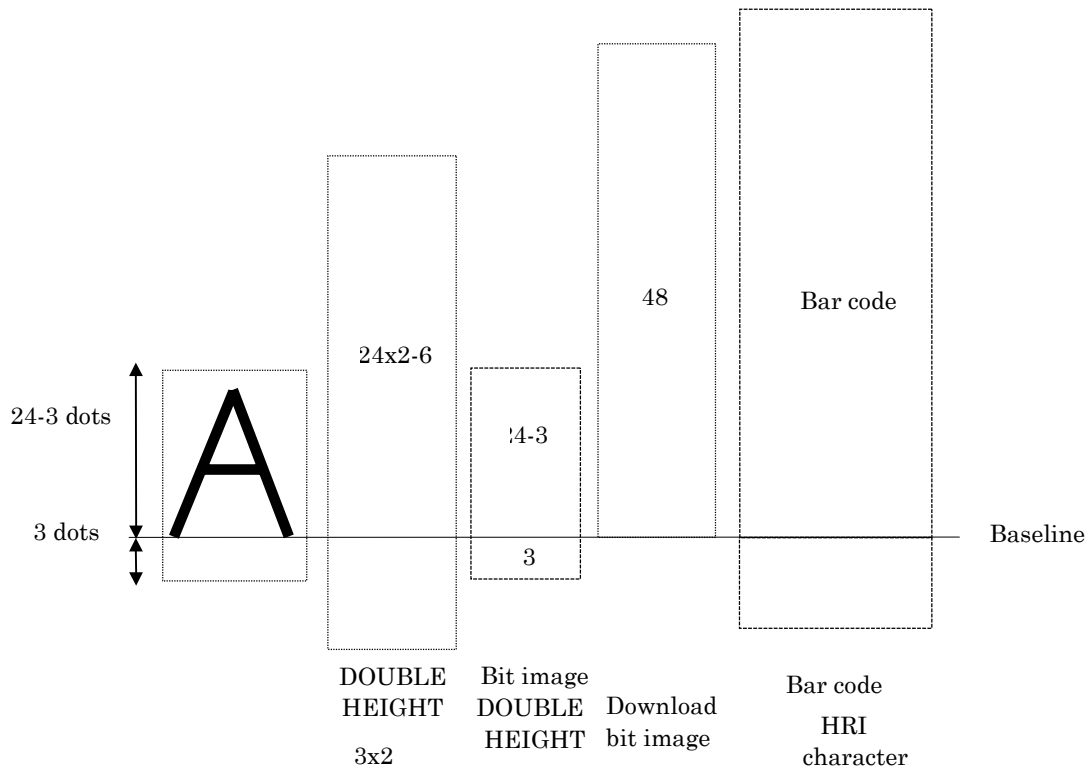
[Description]

- Specifies the horizontal size of bar code.
- “n” denotes the number of dots in horizontal direction of thin bar.
- Default is n=3.

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### 12-7. Position of character

Print mapping position of character (baseline) is as shown in the figure below.



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