



M-520146
ISSUE 1B

PROGRAMMING INSTRUCTION

for **MICROLINE 82A/83A**
STANDARD DOT-IMPACT
MATRIX LINE PRINTER

Character Generator (for OEE)

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1. GENERAL

This instruction manual describes the procedure for writing character patterns into a character generator to be mounted in MICROLINE 82A/83A printer.



2. MEMORY

MICROLINE 82A/83A can use the following memories for the character generator (CG):

- . EPROM 2716 (2 KB, INTEL) or the equivalent
- . Masked ROM 2316E (2 KB, INTEL) or the equivalent

The character generator is mounted at the position Q4 on the printed circuit board after writing character patterns.

3. ADDRESS AND POLARITY

EPROM 2716 has 11 address pins and 8 output pins as shown in Fig. 1.

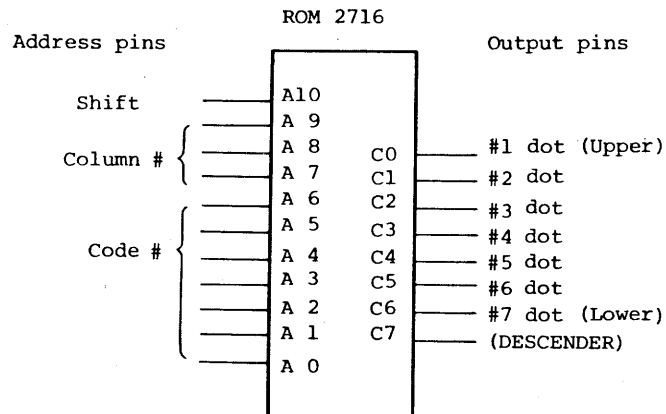


Fig. 1 EPROM 2716

The address pins A₀ to A₆ correspond to the input code, while A₇ to A₉ assign the column numbers of a character pattern, and A₁₀ assigns the shift status of the input code.

The output pins O₀ to O₆ correspond to the individual dots of a character pattern: O₀ corresponds to the uppermost dot #1, and O₆ to the lowest dot #7. The output pin O₇ indicates whether the character concerned is a DESCENDER character.

The dot pattern data has the following polarity:

- (1) Presence of dot "0" (low level)
- (2) Absence of dot "1" (high level)



4. CHARACTER ALLOCATION OF CHARACTER GENERATOR

Fig. 2, Character Set, shows characters and the corresponding codes to be input from the interface of the printer.

b_1 to b_8 indicate the individual bits of the input code. As shown in Fig. 2, alphanumerics and symbols are allocated when $b_8 = 0$ or SI side, and graphics (mosaic patterns) are allocated when $b_8 = 1$ or SO side.

Refer to Fig. 2 for details of the character set.

These characters, symbols and graphics are allocated in the character generator as shown in Fig. 2. Addresses A_0 to A_6 , and A_{10} are determined according to this table. Fig. 2 shows an example of a standard character generator, where all necessary characters and graphics are allocated.

b s = 0										b s = 1									
b7	0	0	0	0	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1
b6	0	0	1	1	0	0	1	1	1	0	0	1	1	0	0	1	1	1	1
b5	0	1	0	1	0	1	0	1	1	0	1	0	1	0	1	0	1	0	1
b4 b3 b2 b1	R	C	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
0 0 0 0	0				SP	0	②	P	⑦	p									
0 0 0 1	1		DC1	!	1	A	Q	a	q										
0 0 1 0	2			"	2	B	R	b	r										
0 0 1 1	3		DC3	①	3	C	S	c	s										
0 1 0 0	4		DC4	\$	4	D	T	d	t										
0 1 0 1	5			%	5	E	U	e	u										
0 1 1 0	6			&	6	F	V	f	v										
0 1 1 1	7			'	7	G	W	g	w										
1 0 0 0	8		CAN	(	8	H	X	h	x										
1 0 0 1	9			)	9	I	Y	i	y										
1 0 1 0	A	LF		*	:	J	Z	j	z										
1 0 1 1	B	VT	ESC	+	;	K	③	k	⑧										
1 1 0 0	C	FF		,	<	L	④	l	⑨										
1 1 0 1	D	CR	GS	-	=	M	⑤	m	⑩										
1 1 1 0	E		RS	.	>	N	⑥	n	⑪										
1 1 1 1	F		US	/	?	O	-	o	DEL										

Note: 1) For TRS-80, even when the input code of "DEL" is input, it is processed as a space when printing.

2)  indicates a DESCENDER character. (for 6 LPI only)

Language	1	2	3	4	5	6	7	8	9	10	11
US ASCII	#	@	[	\	]	^	`				~
BRITISH	£										
GERMAN		§	Ä	Ö	Ü			ä	ö	ü	ß
FRENCH	£	à	•	ç	§			é	ù	è	ê
SWEDISH		É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
DANISH			Æ	Φ	Å	Ü		æ	ø	å	ü
NORWEGIAN			Æ	Φ	Å		•	æ	ø	å	
NETHERLANDISH	£			IJ					ij		
ITALIAN	£	§	•	ç	é		ù	à	ò	è	ì
TRS-80			l	l	-	-					

Note: Differences among languages (Same as US ASCII if blank)

Fig. 2-1 Character Set (Input Code)
Europe & USA 8 Bits (Standard)

				S I SIDE								S O SIDE							
b7	b6	b5	b4	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
b3	b2	b1	R	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0		SP	0	②	P	⑦	p								
0	0	0	1	1	DC1	!	!	A	Q	a	q	DC1							
0	0	1	0	2		"	2	B	R	b	r								
0	0	1	1	3	DC3	①	3	C	S	c	s	DC3							
0	1	0	0	4	DC4	\$	4	D	T	d	t	DC4							
0	1	0	1	5		%	5	E	U	e	u								
0	1	1	0	6		&	6	F	V	f	v								
0	1	1	1	7		'	7	G	W	g	w								
1	0	0	0	8	CAN	(	8	H	X	h	x	CAN							
1	0	0	1	9		)	9	I	Y	i	y								
1	0	1	0	A	LF	*	:	J	Z	j	z	LF							
1	0	1	1	B	VT ESC	+	;	K	③	k	⑧	VT ESC							
1	1	0	0	C	FF	,	<	L	④	l	⑨	FF							
1	1	0	1	D	CR GS	-	=	M	⑤	m	⑩	CR GS							
1	1	1	0	E	SO RS	.	>	N	⑥	n	⑪	SO RS							
1	1	1	1	F	SI US	/	?	O	—	o	DEL	SI US							

Note: 1) For TRS-80, even when the input code of "DEL" is input, it is processed as a space when printing.

2)  indicates a DESCENDER character. (for 6 LPI only)

Language	1	2	3	4	5	6	7	8	9	10	11
US ASCII	#	@	[	\	]	^	`				~
BRITISH	£										
GERMAN		§	Ä	Ö	Ü			ä	ö	ü	ß
FRENCH	£	à	•	ç	§			é	ù	è	ê
SWEDISH		É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
DANISH			Æ	Φ	Å	Ü		æ	ø	å	ü
NORWEGIAN			Æ	Φ	Å		•	æ	ø	å	
NETHERLANDISH	£			IJ					ij		
ITALIAN	£	§	•	ç	é		ù	à	ò	è	ì
TRS-80			!	!	-	-					

Note: Differences among languages (Same as US ASCII if blank)

Fig. 2-2 Character Set (Input Code)
Europe & USA 7 Bits (Standard)

				b8 = 0								b8 = 1								
				b7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				b6	0	0	1	1	0	0	1	1	0	0	1	1	0	1	1	
				b5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	1	
b4	b3	b2	b1	C	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0			SP								SP					
0	0	0	1	1			DC1								DC1					
0	0	1	0	2																
0	0	1	1	3			DC3								DC3					
0	1	0	0	4			DC4								DC4					
0	1	0	1	5																
0	1	1	0	6																
0	1	1	1	7																
1	0	0	0	8			CAN								CAN					
1	0	0	1	9																
1	0	1	0	A	LF										LF					
1	0	1	1	B	VT	ESC									VT	ESC				
1	1	0	0	C	FF										FF					
1	1	0	1	D	CR	GS									CR	GS				
1	1	1	0	E		RS									RS					
1	1	1	1	F		US									US					

Note: Nonstandard character generator is used.

Fig. 2-3 Character Set (Input Code)
8 Bits (Option)

SI SIDE										SO SIDE									
b7	0	0	0	0	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1
b6	0	0	1	1	1	0	1	1	1	0	0	1	1	1	0	1	1	1	1
b5	0	1	0	1	0	1	0	1	1	0	1	0	1	0	1	0	1	1	1
b4 b3 b2 b1	C	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F		
0 0 0 0	0			SP								SP							
0 0 0 1	1		DC1									DC1							
0 0 1 0	2																		
0 0 1 1	3		DC3									DC3							
0 1 0 0	4		DC4									DC4							
0 1 0 1	5																		
0 1 1 0	6																		
0 1 1 1	7																		
1 0 0 0	8		CAN									CAN							
1 0 0 1	9																		
1 0 1 0	A	LF										LF							
1 0 1 1	B	VT	ESC									VT	ESC						
1 1 0 0	C	FF										FF							
1 1 0 1	D	CR	GS									CR	GS						
1 1 1 0	E	SO	RS									SO	RS						
1 1 1 1	F	SI	US							DEL		SI	US					DEL	

Note: Nonstandard character generator is used.

Fig. 2-4 Character Set (Input Code)
7 Bits (Option)

A 10 = 0										A 10 = 1								
A6	0	0	0	0	1	1	1	1		0	0	0	0	1	1	1	1	
A5	0	0	1	1	0	0	1	1		0	0	1	1	0	0	1	1	
A4	0	1	0	1	0	1	0	1		0	1	0	1	0	1	0	1	
A3A2A1A0	R	C	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0 0 0 0	0	↑	↑	SP	0	@	P	·	p	↑	↑	Ä	ä			·	p	
0 0 0 1	1	↑	↑	!	1	A	Q	a	q	↑	↑	Å	å			a	q	
0 0 1 0	2	↑	↑	"	2	B	R	b	r	↑	↑	à	è			b	r	
0 0 1 1	3	↑	↑	#	3	C	S	c	s	↑	↑	É	é			c	s	
0 1 0 0	4	↑	↑	\$	4	D	T	d	t	↑	↑	ê	ù			d	t	
0 1 0 1	5	↑	↑	%	5	E	U	e	u	↑	↑	Ü	ü			e	u	
0 1 1 0	6	↑	↑	&	6	F	V	f	v	↑	↑	Ö	ö			f	v	
0 1 1 1	7	↑	↑	'	7	G	W	g	w	↑	↑	Ò	ì			g	w	
1 0 0 0	8	↑	↑	(	8	H	X	h	x	↑	↑	Æ	æ			h	x	
1 0 0 1	9	↑	↑	)	9	I	Y	i	y	↑	↑	Φ	φ			i	y	
1 0 1 0	A	↑	↑	*	:	J	Z	j	z	↑	↑	IJ	ij			j	z	
1 0 1 1	B	↑	↑	+	;	K	Ł	k	}	↑	↑	†	‡			k		
1 1 0 0	C	↑	↑	,	<	L	ł	l		↑	↑	§	ß			l	,	
1 1 0 1	D	↑	↑	—	=	M	ł	m	}	↑	↑	€	—			m	:	
1 1 1 0	E	↑	↑	.	>	N	^	n	~	↑	↑	←	→			n	;	
1 1 1 1	F	↓	↓	/	?	O	—	o	■	↓	↓	š	•			o	—	

ASCII characters

Special European characters

Small alpha-betical characters and symbols for 8 LPI

- Note: 1) This table is a data table of the character generator, and is different from the character set shown in Fig. 2.
- 2) In this table, character positions are indicated with a dash: i.e. C'/R', discriminating from those in the character set table.
- 3) indicates a DESCENDER character.

Fig. 3 Character Allocation Table of Character Generator

5. CODE CONVERSION

When preparing character sets of various kind of languages using characters in the character generator shown in Fig. 3, code conversion is necessary so that the input codes (Fig. 2) correspond to the required characters (Fig. 3).

The character set given in the character allocation table of character generator (Fig. 3) is of US ASCII, and the character positions in the allocation table correspond to those in the character set (input code) table shown in Fig. 2.

To make a new character set of another language based on this standard character set, some characters need to be replaced with those which are appropriate to the language concerned and stored in the character generator. Consequently, code conversion is required so that their input codes correspond properly to the desired characters.

Fig. 5 shows the code conversion table. The LANGUAGE in this table can be selected by using the DIP switches on the operation panel circuit board of the printer. (See Fig. 4.) In the conversion table, the heading row indicates the C/R (b₀ to b₈) numbers in Fig. 2 of the codes to be converted according to LANGUAGE, and the central blocks indicate the C'/R' (A₀ to A₁₀) numbers in Fig. 3 of the characters to be assigned after conversion.

DIP switch	ON				OFF
SW5	7 bits				8 bits

No.	DIP switch				LANGUAGE
	SW1	SW2	SW3	SW4	
1					US ASCII
2	ON				Not used
3		ON			BRITISH
4	ON	ON			GERMAN
5			ON		FRENCH
6	ON		ON		SWEDISH
7		ON	ON		DANISH
8	ON	ON	ON		NORWEGIAN
9				ON	NETHERLANDISH
10	ON			ON	ITALIAN
11		ON		ON	TRS-80
12	ON	ON		ON	Not used
13			ON	ON	Not used
14	ON		ON	ON	Not used
15		ON	ON	ON	Not used
16	ON	ON	ON	ON	Option

Note: "ON" means that SW is at ON position.

Fig. 4 Assignment of LANGUAGE

DIP SW	LANGUAGE	C/R													
			2/3	4/0	5/B	5/C	5/D	5/E	6/0	7/B	7/C	7/D	7/E	7/F	A/0
	ADDRESS	H L	0	1	2	3	4	5	6	7	8	9	A	B	C
0	US ASCII	F	2/3 #	4/0 @	5/B [	5/C \	5/D]	5/E ^	6/0 `	7/B {	7/C	7/D }	7/E ~	7/F ■	
2	BRITISH	B	A/D £												
3	GERMAN	3		A/F §	A/0 Ä	A/6 Ö	A/5 Ü			B/0 ü	B/6 ö	B/5 ü	B/C ß	7/F ■	
4	FRENCH	D	A/D £	A/2 ò	B/F °	A/C Ç	A/F §			B/3 é	B/4 ù	B/2 è	A/4 ê	7/F ■	
5	SWEDISH	5		A/3 É	A/0 Ä	A/6 Ö	A/1 Å	A/5 Ü	B/3 é	B/0 ü	B/6 ö	B/1 ø	B/5 ü	7/F ■	
6	DANISH	9			A/8 Æ	A/9 Ø	A/1 Å	A/5 Ü		B/8 æ	B/9 ø	B/1 ø	B/5 ü	7/F ■	
7	NORWEGIAN	1			A/8 Æ	A/9 Ø	A/1 Å		B/F °	B/8 æ	B/9 ø	B/1 ø		7/F ■	
8	NETHERLANDISH	E	A/D £			A/A IJ					B/A IJ			7/F ■	
9	ITALIAN	6	A/D £	A/F §	B/F °	A/C Ç	B/3 é		B/4 ù	A/2 ò	A/7 ò	B/2 è	B/7 ì	7/F ■	
A	TRS-80	A			A/B †	B/B ‡	A/E ←	B/E →					B/D ~	2/0 SP	

- Note: 1) Same as US ASCII if blank.
 2) (SP) means SPACE.
 3) ■ means DELETE.

Fig. 5 Code Conversion Table

The code conversion is conducted by the conversion table inside the control ROM (006; mounted at Q6 on the circuit board).

In the control ROM (006), addresses of the conversion table are represented by three hexadecimal digits, "3HL": the first digit is fixed as "3", and the middle and last digits are given by "H" and "L" in Fig. 5. For example, if "£" of BRITISH is assigned after conversion, write the data "AD" into the address "3B0" of the control ROM (006).

No characters other than those given in Fig. 5 can be replaced in the control ROM (006).

6. PROGRAMMING METHOD OF CHARACTER CODES

6.1 Programming of Data (O_0 to O_7)

The character generator generates character patterns for a 9-pin print head as shown in Fig. 6. The character patterns are classified into two types: one is of ASCENDER characters, which are to be printed by using the head pins #1 to #7, and the other is of DESCENDER characters (6LPI mode printing only), which are to be printed by using #3 to #9.

There are the following eight DESCENDER characters: ",", ";" (semicolon), "_" (underline), "g", "j", "p", "q", and "y".

For 8 LPI mode printing, however, all characters are designed as ASCENDER because the #9 head pin position is overlapped with the #1 head pin position after line spacing.

For the ASCENDER character, the character generator outputs O_0 to O_6 correspond to the head pins #1 to #7, respectively. For the DESCENDER character, O_0 to O_6 correspond to #3 to #9, respectively. Selection of ASCENDER/DESCENDER is controlled by the control ROM (005), switching over the polarity of O_7 .

The character dot pattern data is defined as follows.

O_0 to O_6 : Presence of dot ... "0"

Absence of dot "1"

O_7 : DESCENDER "0"

ASCENDER "1"

This definition holds as well when "OPTION" LANGUAGE is selected.

6.2 Programming of Address (A_0 to A_{10})

A character pattern is composed of nine equally divided (half-dot pitch) columns #0 to #8 as shown in Fig. 6.

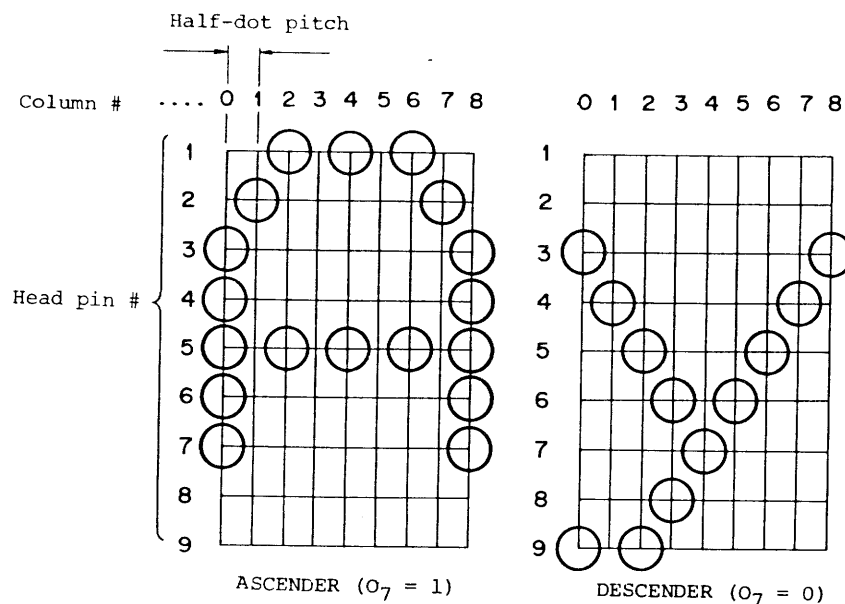
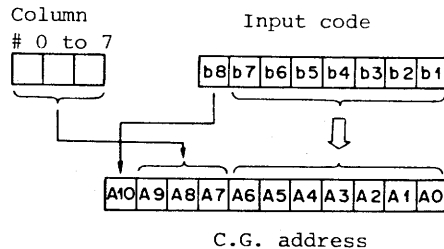


Fig. 6 Character Pattern

Fig. 7 shows the address assignment method of the character generator for each column number. For the columns #0 to #7, each column number itself is expressed in binary (2^3), and allocated to three address bits A_7 to A_9 . For the column #8, a binary number "100" is always given to the address bits A_4 to A_6 . The input code is allocated to the remainder of the address bits, as shown in Fig. 7.

(a) Column # 0 to 7



(b) Column # 8

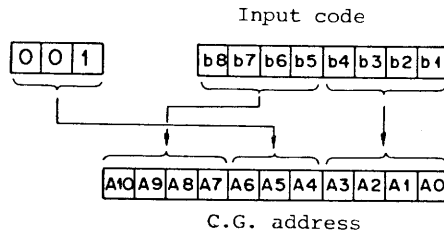


Fig. 7 Character Address Assignment Method

As for the symbol "`" (grave accent) and the small alphabetical characters "a" to "z", their input codes are converted to those written in the C' columns, E and F, in Fig. 3 by the control ROM (005) so that these characters are treated as a group including no DESCENDER character for 8 LPI mode printing. Thus ASCENDER-designed small alphabetical characters and the grave accent are provided in the C' columns, E and F. The symbols ",", ":", ";", and "_" are also provided in the columns of E and F in Fig. 3, however, they are not actually used. The input codes of these symbols are not converted to those written in the C' column, E and F when printing in the 8 LPI mode: the same character patterns of these symbols as the 6 LPI mode are used, and printed by the control ROM (005) not shifting them down by two dots.

When "OPTION" LANGUAGE is selected, no code conversion is performed for those characters written in the C' columns, E and F in Fig. 3.

Fig. 8 shows an example of preparing the address and the data for the character "A". As for the other characters, refer to Figs. 12 to 29.

NOTE

Precautions for preparing dot patterns

Do not make a dot pattern composed of any two neighbouring dots having a half-dot pitch in the same row. In other words, do not let the same head pin print dots continuously in a half-dot pitch. For example, for the dot pattern of "A" in Fig. 6, the head pin #5 prints the dots at the columns #0, #2, #4, #6 and #8: no half-dot pitch is included in any row directions.

DATA									ADDRESS											
HEXA	BINARY								BINARY										HEXA	
DECIMAL	07	06	05	04	03	02	01	00	A0	A9	A8	A7	A6	A5	A4	A3	A2	A1	A0	DECIMAL
83	1	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	1	041
FD	1	1	1	1	1	1	0	1		0	0	1								0C1
EE	1	1	1	0	1	1	1	0		0	1	0								141
FF	1	1	1	1	1	1	1	1		0	1	1								1C1
EE	1	1	1	0	1	1	1	0		1	0	0								241
FF	1	1	1	1	1	1	1	1		1	0	1								2C1
EE	1	1	1	0	1	1	1	0		1	1	0								341
FD	1	1	1	1	1	1	0	1		1	1	1								3C1
83	1	0	0	0	0	0	1	1	1	0	0	0	0	1	0	0	0	1	211	
7 6 5 4 3 2 1									SHIFT	COLUMN #				CODE # (cf. Fig. - 3)						
HEAD PIN #																				

Note: 07 = "0" for assignment of the DESCENDER character
 07 = "1" for assignment of the ASCENDER character

Fig. 8 Example of Character Preparation (Character "A")

7. PROGRAMMING METHOD OF GRAPHIC CODES

A mosaic graphic pattern printing system is adopted for the printer.

Because repetition of the same column dot pattern is often involved in graphic printing, only component patterns are stored in the character generator. Fig. 9 shows an example of a graphic pattern composed of several column dot patterns.

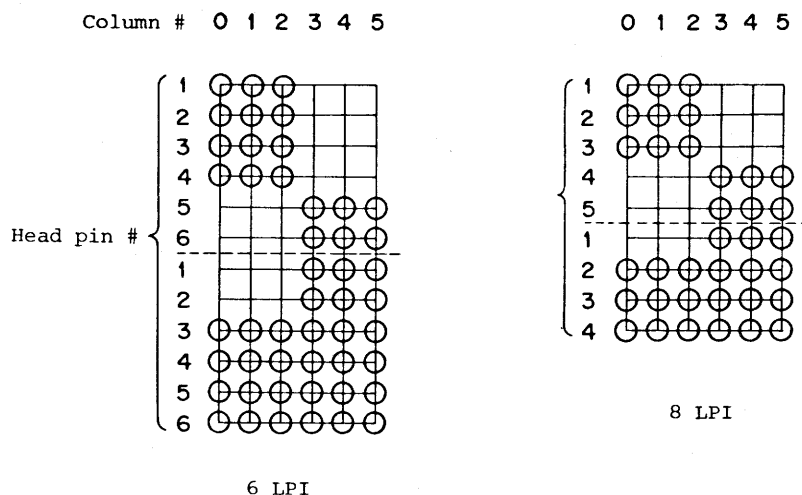


Fig. 9 Graphic Pattern

In this graphic printing system, an area made by a one character pitch and a one line spacing pitch is defined as a block of graphic pattern as shown in Fig. 10. One block is composed of six sub-blocks. The six sub-block patterns are combined to form a single graphic pattern.

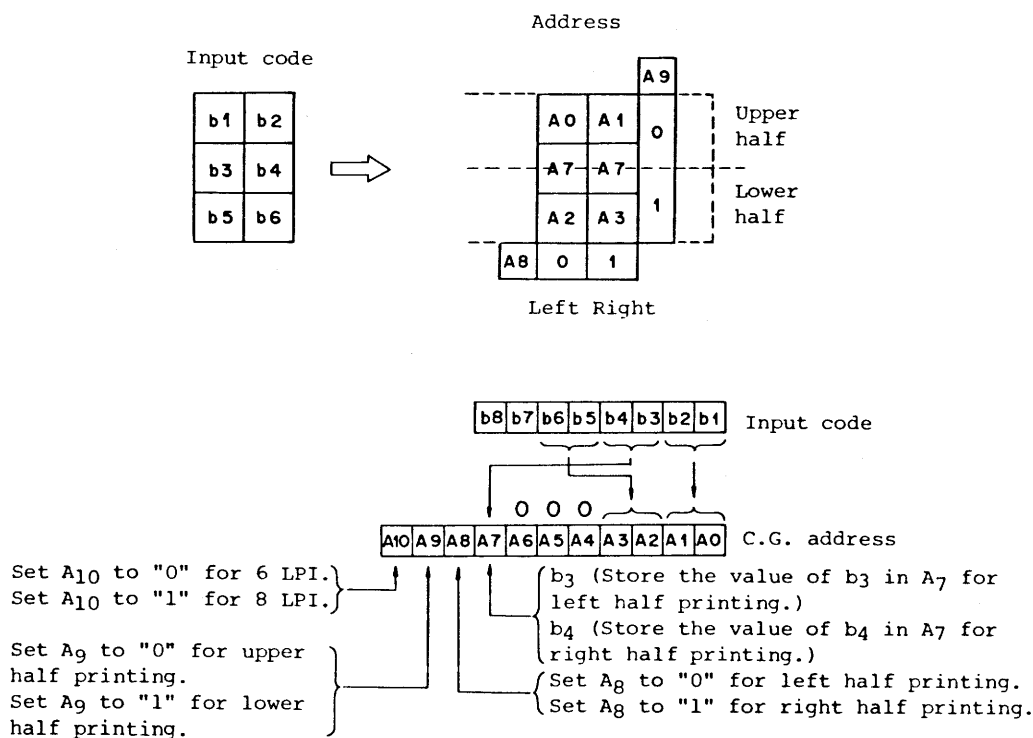


Fig. 10 Graphic Address Assignment Method

The input code bits b_1 to b_6 are allocated to the respective sub-blocks, and when the input code bit is "1", the sub-block corresponding to the bit is printed.

As shown in Fig. 9, the graphic pattern to be printed in the 6 LPI and 10 CPI mode is composed of 12 vertical dots by 6 horizontal dots. In actual printing, the vertical dots are printed being divided into the upper half and the lower half: these upper and lower halves are printed by performing the half pitch line spacing twice in the single directional shortest distance mode to complete one pattern.

Because the upper half columns #0 to #2 have the same column dot pattern, the same column dot pattern is printed three times, and so do the lower half columns #3 to #5.

A graphic pattern to be printed in the 8 LPI mode has 9 vertical dots. Similar to 6 LPI mode printing, the pattern is printed being divided into the upper half of 5 dots and the lower half of 4 dots.

Fig. 10 shows the address assignment method for graphic patterns. The input code bits b_1 , b_2 , b_5 and b_6 correspond to the address bits A_0 , A_1 , A_2 and A_3 , respectively. b_3 or b_4 is allocated to A_7 . A_8 and A_9 are determined by the print head position. A_{10} assigns the line spacing pitch. Fig. 11 shows an example of graphic pattern preparation.

No graphic patterns other than those provided in the standard character generator can be used.

Figs. 12 to 19 show the standard character generator address tables for the graphic patterns.

	DATA									ADDRESS											HEXA DECIMAL	e.x. #	
	HEXA DECIMAL	BINARY								BINARY													
		07	06	05	04	03	02	01	00	A0	A9	A8	A7	A6	A5	A4	A3	A2	A1	A0			
6 LPI	F0	1	1	1	1	0	0	0	0	0	0	0	0								00D	①	
	C0	1	1	0	0	0	0	0	0		0	0	1								08D	②	
	FF	1	1	1	1	1	1	1	1		0	1	0								10D	③	
	CF	1	1	0	0	1	1	1	1		0	1	1								18D	④	
	C3	1	1	0	0	0	0	1	1		1	0	0								20D	⑤	
	C0	1	1	0	0	0	0	0	0		0	1	0	1							28D	⑥	
	C3	1	1	0	0	0	0	0	1		1	1	1	0							30D	⑦	
	C0	1	1	0	0	0	0	0	0		0	1	1	1	0	0	0	1	1	0	1	38D	⑧
8 LPI	F8	1	1	1	1	1	0	0	0	1	0	0	0	0	0	1	1	0	1		40D	①	
	E0	1	1	1	0	0	0	0	0		0	0	1								48D	②	
	FF	1	1	1	1	1	1	1	1		0	1	0								50D	③	
	E7	1	1	1	0	0	1	1	1		1	0	1	1							58D	④	
	F1	1	1	1	1	0	0	0	1		1	0	0								60D	⑤	
	F0	1	1	1	1	0	0	0	0		1	0	1								68D	⑥	
	F1	1	1	1	1	0	0	0	1		1	1	0								70D	⑦	
	F0	1	1	1	1	0	0	0	0		1	1	1								78D	⑧	

Note: When column dot patterns are prepared as shown in the table above, the following four different graphic patterns can be printed. (Example: 6 LPI)

The graphic pattern is assigned by four addresses as shown below.

[Example]

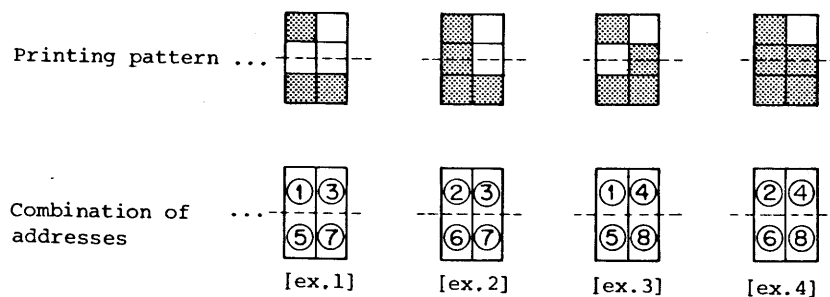


Fig. 11 Example of Graphic Pattern Preparation



8. ADDRESS TABLES FOR STANDARD CHARACTER GENERATOR

Figs. 12 to 25 show tables of addresses and data for the character generator mounted as a standard.

In the tables, the character position C'/R' indicates the column and row positions of the character allocation table in Fig. 3. The addresses and the data correspond to the columns #0 to #8.

To change the dot pattern of a character, find the character in the following address tables, and give it new write data referring to the example shown in Fig. 8.

Addresses not necessary to be assigned are all provided with the data "FF" in hexadecimal in the following tables.

C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data
0/0 	000	FF	0/1 	001	F0	0/2 	002	FF	0/3 	003	F0
	080	CF		081	C0		082	CF		083	C0
	100	FF		101	FF		102	F0		103	F0
	180	CF		181	CF		182	C0		183	C0
	200	FF		201	FF		202	FF		203	FF
	280	FC		281	FC		282	FC		283	FC
	300	FF		301	FF		302	FF		303	FF
	380	FC		381	FC		382	FC		383	FC
0/4 	004	FF	0/5 	005	F0	0/6 	006	FF	0/7 	007	F0
	084	CF		085	C0		086	CF		087	C0
	104	FF		105	FF		106	F0		107	F0
	184	CF		185	CF		186	C0		187	C0
	204	C3		205	C3		206	C3		207	C3
	284	C0		285	C0		286	C0		287	C0
	304	FF		305	FF		306	FF		307	FF
	384	FC		385	FC		386	FC		387	FC
0/8 	008	FF	0/9 	009	F0	0/A 	00A	FF	0/B 	00B	F0
	088	CF		089	C0		08A	CF		08B	C0
	108	FF		109	FF		10A	F0		10B	F0
	188	CF		189	CF		18A	C0		18B	C0
	208	FF		209	FF		20A	FF		20B	FF
	288	FC		289	FC		28A	FC		28B	FC
	308	C3		309	C3		30A	C3		30B	C3
	388	C0		389	C0		38A	C0		38B	C0
0/C 	00C	FF	0/D 	00D	F0	0/E 	00E	FF	0/F 	00F	F0
	08C	CF		08D	C0		08E	CF		08F	C0
	10C	FF		10D	FF		10E	F0		10F	F0
	18C	CF		18D	CF		18E	C0		18F	C0
	20C	C3		20D	C3		20E	C3		20F	C3
	28C	C0		28D	C0		28E	C0		28F	C0
	30C	C3		30D	C3		30E	C3		30F	C3
	38C	C0		38D	C0		38E	C0		38F	C0

- Note: 1) This table is of C' = 0 and R' = 0 to F.
- 2) Addresses and data are expressed in hexadecimal.
- 3) The following four combinations can be given to the middle shadowed part of a graphic pattern:
 , , , and .

Fig. 12 C.G. Address Table (Graphics, 8 LPI)

C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data
2/0 SPACE	020	FF	2/1 ! (exclamation mark)	021	FF	2/2 " (quotation mark)	022	FF	2/3 # (number sign)	023	EB
	0A0	FF		0A1	FF		0A2	FF		0A3	FF
	120	FF		121	FF		122	F8		123	80
	1A0	FF		1A1	FF		1A2	FF		1A3	FF
	220	FF		221	B0		222	FF		223	EB
	2A0	FF		2A1	FF		2A2	FF		2A3	FF
	320	FF		321	FF		322	F8		323	80
	3A0	FF		3A1	FF		3A2	FF		3A3	FF
	110	FF		111	FF		112	FF		113	EB
2/4 \$ (dollar sign)	024	FB	2/5 % (percent sign)	025	F9	2/6 & (ampersand)	026	FF	2/7 , (apostrophe)	027	FF
	0A4	D5		0A5	BF		0A6	CF		0A7	FE
	124	FF		125	D9		126	B5		127	FB
	1A4	D5		1A5	EF		1A6	FA		1A7	FC
	224	AA		225	F7		226	B7		227	FF
	2A4	D5		2A5	FB		2A6	EA		2A7	FF
	324	FF		325	CD		326	DD		327	FF
	3A4	D5		3A5	FE		3A6	BF		3A7	FF
	114	EF		115	CF		116	EF		117	FF
2/8 (round bracket open)	028	FF	2/9) (round bracket close)	029	FF	2/A * (asterisk)	02A	F7	2/B + (plus)	02B	F7
	0A8	FF		0A9	FF		0AA	FF		0AB	FF
	128	FF		129	BE		12A	D5		12B	F7
	1A8	FF		1A9	DD		1AA	EB		1AB	FF
	228	E3		229	E3		22A	F7		22B	C1
	2A8	DD		2A9	FF		2AA	EB		2AB	FF
	328	BE		329	FF		32A	D5		32B	F7
	3A8	FF		3A9	FF		3AA	FF		3AB	FF
	118	FF		119	FF		11A	F7		11B	F7
2/C , (comma)	02C	7F	2/D - (hyphen)	02D	F7	2/E . (period)	02E	FF	2/F / (vergule)	02F	FF
	0AC	6F		0AD	FF		0AE	9F		0AF	BF
	12C	3F		12D	F7		12E	FF		12F	DF
	1AC	4F		1AD	FF		1AE	9F		1AF	EF
	22C	7F		22D	F7		22E	FF		22F	F7
	2AC	7F		2AD	FF		2AE	FF		2AF	FB
	32C	7F		32D	F7		32E	FF		32F	FD
	3AC	7F		3AD	FF		3AE	FF		3AF	FE
	11C	7F		11D	F7		11E	FF		11F	FF

- Note: 1) This table is of C' = 2 and R' = 0 to F.
2) Addresses and data are expressed in hexadecimal.

Fig. 13 C.G. Address Table

C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data
3/0 0 (ZERO without slash)	030	E3	3/1 1 	031	FF	3/2 2 	032	BD	3/3 3 	033	DE
	0B0	DD		0B1	FF		0B2	FF		0B3	BF
	130	FF		131	BD		132	9E		133	FE
	1B0	BE		1B1	FF		1B2	FF		1B3	BF
	230	FF		231	80		232	AE		233	FA
	2B0	BE		2B1	FF		2B2	FF		2B3	BF
	330	FF		331	BF		332	B6		333	F4
	3B0	DD		3B1	FF		3B2	FF		3B3	BF
	190	E3		191	FF		192	B9		193	CE
3/4 4 	034	CF	3/5 5 	035	D8	3/6 6 	036	C3	3/7 7 	037	FE
	0B4	F7		0B5	BF		0B6	BD		0B7	FF
	134	DB		135	FA		136	F6		137	FE
	1B4	FD		1B5	BF		1B6	BF		1B7	9F
	234	DE		235	FA		236	F6		237	EE
	2B4	FF		2B5	BF		2B6	BF		2B7	F7
	334	83		335	FA		336	F6		337	FA
	3B4	FF		3B5	BF		3B6	BF		3B7	FD
	194	DF		195	C6		196	CF		197	FE
3/8 8 	038	CF	3/9 9 	039	F9	3/A : (colon)	03A	FF	3/B ; (semi colon)	03B	7F
	0B8	B1		0B9	FE		0BA	FF		0BB	7F
	138	FE		139	B7		13A	FF		13B	7F
	1B8	B7		1B9	FE		1BA	C9		1BB	6C
	238	FE		239	B7		23A	FF		23B	3F
	2B8	B7		2B9	FE		2BA	C9		2BB	4C
	338	FE		339	B7		33A	FF		33B	7F
	3B8	B1		3B9	DE		3BA	FF		3BB	7F
	198	CF		199	E1		19A	FF		19B	7F
3/C < (less than sign)	03C	FF	3/D = (equal sign)	03D	EB	3/E > (greater than sign)	03E	FF	3/F ? (question mark)	03F	FF
	0BC	FF		0BD	FF		0BE	BE		0BF	FD
	13C	FF		13D	EB		13E	DD		13F	FE
	1BC	FF		1BD	FF		1BE	EB		1BF	FF
	23C	F7		23D	EB		23E	F7		23F	AE
	2BC	EB		2BD	FF		2BE	FF		2BF	FF
	33C	DD		33D	EB		33E	FF		33F	F6
	3BC	BE		3BD	FF		3BE	FF		3BF	F9
	19C	FF		19D	EB		19E	FF		19F	FF

Note: 1) This table is of C' = 3 and R' = 0 to F.

2) Addresses and data are expressed in hexadecimal.

Fig. 14 C.G. Address Table (For the areas other than U.S.A)

C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data
4/0 @ (commercial at)	040	C3	4/1 A	041	83	4/2 B	042	BE	4/3 C	043	C1
	0C0	BD		0C1	FD		0C2	C1		0C3	BE
	140	FE		141	EE		142	BE		143	FF
	1C0	B7		1C1	FF		1C2	F7		1C3	BE
	240	EA		241	EE		242	BE		243	FF
	2C0	BF		2C1	FF		2C2	F7		2C3	BE
	340	EA		341	EE		342	BE		343	FF
	3C0	BD		3C1	FD		3C2	F7		3C3	BE
	210	F3		211	83		212	C9		213	DD
4/4 D	044	BE	4/5 E	045	80	4/6 F	046	80	4/7 G	047	C1
	0C4	C1		0C5	FF		0C6	FF		0C7	BE
	144	BE		145	B6		146	F6		147	FF
	1C4	FF		1C5	FF		1C6	FF		1C7	BE
	244	BE		245	B6		246	F6		247	F7
	2C4	FF		2C5	FF		2C6	FF		2C7	BE
	344	BE		345	B6		346	F6		347	F7
	3C4	DD		3C5	FF		3C6	FF		3C7	BE
	214	E3		215	BE		216	FE		217	C5
4/8 H	048	80	4/9 I	049	FF	4/A J	04A	DF	4/B K	04B	80
	0C8	FF		0C9	FF		0CA	BF		0CB	FF
	148	F7		149	BE		14A	FF		14B	F7
	1C8	FF		1C9	FF		1CA	BF		1CB	FF
	248	F7		249	80		24A	FE		24B	FB
	2C8	FF		2C9	FF		2CA	BF		2CB	F7
	348	F7		349	BE		34A	C0		34B	ED
	3C8	FF		3C9	FF		3CA	FF		3CB	DF
	218	80		219	FF		21A	FE		21B	BE
4/C L	04C	80	4/D M	04D	80	4/E N	04E	80	4/F O	04F	C1
	0CC	FF		0CD	FF		0CE	FF		0CF	BE
	14C	BF		14D	FD		14E	FD		14F	FF
	1CC	FF		1CD	FB		1CE	FB		1CF	BE
	24C	BF		24D	E7		24E	F7		24F	FF
	2CC	FF		2CD	FB		2CE	EF		2CF	BE
	34C	BF		34D	FD		34E	DF		34F	FF
	3CC	FF		3CD	FF		3CE	FF		3CF	BE
	21C	BF		21D	80		21E	80		21F	C1

Note: 1) This table is of C' = 4 and R' = 0 to F.

2) Addresses and data are expressed in hexadecimal.

Fig. 15 C.G. Address Table

C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data
5/0 P	050	FF	5/1 Q	051	C1	5/2 R	052	FF	5/3 S	053	D9
	0D0	80		0D1	BE		0D2	80		0D3	B6
	150	FF		151	FF		152	FF		153	FF
	1D0	EE		1D1	BE		1D2	F6		1D3	B6
	250	FF		251	EF		252	FF		253	FF
	2D0	EE		2D1	BE		2D2	F6		2D3	B6
	350	FF		351	DF		352	EF		353	FF
	3D0	EE		3D1	FE		3D2	D6		3D3	B6
	290	F1		291	A1		292	B9		293	CD
5/4 T	054	FE	5/5 U	055	C0	5/6 V	056	F8	5/7 W	057	C0
	0D4	FF		0D5	BF		0D6	F7		0D7	BF
	154	FE		155	FF		156	EF		157	DF
	1D4	FF		1D5	BF		1D6	DF		1D7	EF
	254	80		255	FF		256	BF		257	F7
	2D4	FF		2D5	BF		2D6	DF		2D7	EF
	354	FE		355	FF		356	EF		357	DF
	3D4	FF		3D5	BF		3D6	F7		3D7	BF
	294	FE		295	C0		296	F8		297	C0
5/8 X	058	FF	5/9 Y	059	FE	5/A Z	05A	FF	5/B [	05B	FF
	0D8	BE		0D9	FD		0DA	BE		0DB	FF
	158	DD		159	FB		15A	DF		15B	FF
	1D8	EB		1D9	F7		1DA	AE		1DB	80
	258	F7		259	8F		25A	F7		25B	FF
	2D8	FB		2D9	F7		2DA	BA		2DB	BE
	358	ED		359	FB		35A	FD		35B	FF
	3D8	DE		3D9	FD		3DA	BE		3DB	BE
	298	BF		299	FE		29A	FF		29B	FF
5/C \]	05C	FF	5/D]	05D	FF	5/E ^	05E	FB	5/F <u>(underline)</u>	05F	3F
	0DC	FE		0DD	BE		0DE	FF		0DF	7F
	15C	FD		15D	FF		15E	FD		15F	3F
	1DC	FB		1DD	BE		1DE	FF		1DF	7F
	25C	F7		25D	FF		25E	FE		25F	3F
	2DC	EF		2DD	80		2DE	FF		2DF	7F
	35C	DF		35D	FF		35E	FD		35F	3F
	3DC	BF		3DD	FF		3DE	FF		3DF	7F
	29C	FF		29D	FF		29E	FB		29F	3F

Note: 1) This table is of C' = 5 and R' = 0 to F.

2) Addresses and data are expressed in hexadecimal.

Fig. 16 C.G. Address Table

C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data
6/0  (grave accent)	060	FF	6/1 a	061	DF	6/2 b	062	FF	6/3 c	063	C7
	0E0	FF		0E1	AF		0E2	80		0E3	BB
	160	FF		161	FB		162	FF		163	FF
	1E0	FE		1E1	AF		1E2	BB		1E3	BB
	260	FD		261	FB		262	FF		263	FF
	2E0	FF		2E1	AF		2E2	BB		2E3	BB
	360	FF		361	FB		362	FF		363	FF
	3E0	FF		3E1	C7		3E2	BB		3E3	BB
	310	FF		311	BF		312	C7		313	F7
6/4 d	064	C7	6/5 e	065	C7	6/6 f	066	FF	6/7 g	067	71
	0E4	BB		0E5	BB		0E6	FB		0E7	6E
	164	FF		165	EF		166	FF		167	3F
	1E4	BB		1E5	BB		1E6	81		1E7	6E
	264	FF		265	EF		266	FE		267	3F
	2E4	BB		2E5	BB		2E6	FB		2E7	6E
	364	FF		365	EF		366	FE		367	3F
	3E4	80		3E5	BB		3E6	FB		3E7	40
	314	FF		315	E7		316	FE		317	7F
6/8 h	068	FF	6/9 i	069	FF	6/A j	06A	7F	6/B k	06B	FF
	0E8	80		0E9	FF		0EA	7F		0EB	80
	168	FF		169	B7		16A	5F		16B	FF
	1E8	F7		1E9	FF		1EA	3F		1EB	EF
	268	FF		269	85		26A	7B		26B	FF
	2E8	FB		2E9	FF		2EA	3F		2EB	E7
	368	FF		369	BF		36A	42		36B	DF
	3E8	FB		3E9	FF		3EA	7F		3EB	BB
	318	87		319	FF		31A	7F		31B	FF
6/C l	06C	FF	6/D m	06D	87	6/E n	06E	FB	6/F o	06F	FF
	0EC	FF		0ED	FF		0EE	87		0EF	C7
	16C	BE		16D	FB		16E	FF		16F	BB
	1EC	FF		1ED	F7		1EE	F7		1EF	FF
	26C	80		26D	8F		26E	FF		26F	BB
	2EC	FF		2ED	F7		2EE	FB		2EF	FF
	36C	BF		36D	FB		36E	FF		36F	BB
	3EC	FF		3ED	FF		3EE	FB		3EF	C7
	31C	FF		31D	87		31E	87		31F	FF

Note: 1) This table is of C' = 6 and R' = 0 to F.

2) Addresses and data are expressed in hexadecimal.

Fig. 17 C.G. Address Table

C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data
7/0 p	070	7F	7/1 q	071	71	7/2 r	072	FF	7/3 s	073	F7
	0F0	00		0F1	6E		0F2	FF		0F3	AB
	170	7F		171	7F		172	FB		173	FF
	1F0	6E		1F1	6E		1F2	87		1F3	AB
	270	7F		271	7F		272	FF		273	FF
	2F0	6E		2F1	6E		2F2	FB		2F3	AB
	370	7F		371	7F		372	FF		373	FF
	3F0	6E		3F1	00		3E2	FB		3F3	AB
	390	71		391	7F		392	F7		393	DF
7/4 t	074	FB	7/5 u	075	FF	7/6 v	076	FB	7/7 w	077	C3
	0F4	FF		0F5	C3		0F6	F7		0F7	BF
	174	C0		175	FF		176	EF		177	DF
	1F4	BF		1F5	BF		1F6	DF		1F7	EF
	274	FB		275	FF		276	BF		277	F7
	2F4	BF		2F5	BF		2F6	DF		2F7	EF
	374	DB		375	FF		376	EF		377	DF
	3F4	FF		3F5	C3		3F6	F7		3F7	BF
	394	FF		395	BF		396	FB		397	C3
7/8 x	078	FF	7/9 y	079	3E	7/A z	07A	FF	7/B {	07B	F7
	0F8	BB		0F9	7D		0FA	BB		0FB	FF
	178	D7		179	3B		17A	DF		17B	F7
	1F8	EF		1F9	57		1FA	BB		1FB	C9
	278	FF		279	6F		27A	EF		27B	BE
	2F8	EF		2F9	77		2FA	BB		2FB	FF
	378	D7		379	7B		37A	F7		37B	BE
	3F8	BB		3F9	7D		3FA	BB		3FB	FF
	398	FF		399	7E		39A	FF		39B	FF
7/C (vertical line)	07C	FF	7/D }	07D	FF	7/E (swung dash)	07E	FD	7/F ■ (delete)	07F	FF
	0FC	FF		0FD	FF		0FE	FE		0FF	D5
	17C	FF		17D	BE		17E	FF		17F	AA
	1FC	FF		1FD	FF		1FE	FE		1FF	D5
	27C	80		27D	BE		27E	FD		27F	AA
	2FC	FF		2FD	C9		2FE	FB		2FF	D5
	37C	FF		37D	F7		37E	FF		37F	AA
	3FC	FF		3FD	FF		3FE	FB		3FF	D5
	39C	FF		39D	F7		39E	FD		39F	FF

Note: 1) This table is of C' = 7 and R' = 0 to F.

2) Addresses and data are expressed in hexadecimal.

Fig. 18 C.G. Address Table

C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data
8/0 	400	FF	8/1 	401	F8	8/2 	402	FF	8/3 	403	F8
	480	E7		481	E0		482	E7		483	E0
	500	FF		501	FF		502	F8		503	F8
	580	E7		581	E7		582	E0		583	E0
	600	FF		601	FF		602	FF		603	FF
	680	FE		681	FE		682	FE		683	FE
	700	FF		701	FF		702	FF		703	FF
	780	FE		781	FE		782	FE		783	FE
8/4 	404	FF	8/5 	405	F8	8/6 	406	FF	8/7 	407	F8
	484	E7		485	E0		486	E7		487	E0
	504	FF		505	FF		506	F8		507	F8
	584	E7		585	E7		586	E0		587	E0
	604	F1		605	F1		606	F1		607	F1
	684	F0		685	F0		686	F0		687	F0
	704	FF		705	FF		706	FF		707	FF
	784	FE		785	FE		786	FE		787	FE
8/8 	408	FF	8/9 	409	F8	8/A 	40A	FF	8/B 	40B	F8
	488	E7		489	E0		48A	E7		48B	E0
	508	FF		509	FF		50A	F8		50B	F8
	588	E7		589	E7		58A	E0		58B	E0
	608	FF		609	FF		60A	FF		60B	FF
	688	FE		689	FE		68A	FE		68B	FE
	708	F1		709	F1		70A	F1		70B	F1
	788	F0		789	F0		78A	F0		78B	F0
8/C 	40C	FF	8/D 	40D	F8	8/E 	40E	FF	8/F 	40F	F8
	48C	E7		48D	E0		48E	E7		48F	E0
	50C	FF		50D	FF		50E	F8		50F	F8
	58C	E7		58D	E7		58E	E0		58F	E0
	60C	F1		60D	F1		60E	F1		60F	F1
	68C	F0		68D	F0		68E	F0		68F	F0
	70C	F1		70D	F1		70E	F1		70F	F1
	78C	F0		78D	F0		78E	F0		78F	F0

- Note: 1) This table is of C' = 8 and R' = 0 to F.
- 2) Addresses and data are expressed in hexadecimal.
- 3) The following four combinations can be given to the middle shadowed part of a graphic pattern:
, , , and .

Fig. 19 C.G. Address Table (Graphics, 8LPI)

C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data
A/0 Ä	420	9F	A/1 Å (capital A with ring)	421	9F	A/2 a' (small a with grave accent)	422	DF	A/3 E' (capital E with acute)	423	83
	4A0	EE		4A1	EF		4A2	AF		4A3	FF
	520	D7		521	D5		522	FB		523	AB
	5A0	FB		5A1	FA		5A2	AE		5A3	FF
	620	DF		621	DF		622	F9		623	A9
	6A0	FB		6A1	FA		6A2	AF		6A3	FE
	720	D7		721	D5		722	FB		723	AB
	7A0	EE		7A1	EF		7A2	C7		7A3	FF
	510	9F		511	9F		512	BF		513	BB
A/4 ë (small e with circumflex)	424	C7	A/5 Ü (capital U with diaeresis or U umlaut)	425	C3	A/6 Ö	426	C7	A/7 O'	427	FF
	4A4	BB		4A5	BE		4A6	BA		4A7	C7
	524	ED		525	FF		526	FF		527	BB
	5A4	BB		5A5	BF		5A6	BB		5A7	FE
	624	EE		625	FF		626	FF		627	B9
	6A4	BB		6A5	BF		6A6	BB		6A7	FF
	724	ED		725	FF		726	FF		727	BB
	7A4	BB		7A5	BE		7A6	BA		7A7	C7
	514	E7		515	C3		516	C7		517	FF
A/8 Æ (capital Æ diphthong)	428	83	A/9 Φ (capital O with slash)	429	C1	A/A IJ (capital IJ ligature)	42A	BE	A/B ↑ (upward arrow)	42B	F7
	4A8	FD		4A9	BE		4AA	C1		4AB	FF
	528	EE		529	EF		52A	BE		52B	FB
	5A8	FF		5A9	BE		5AA	FF		5AB	FF
	628	80		629	F7		62A	FF		62B	C1
	6A8	FF		6A9	BE		6AA	9F		6AB	FF
	728	B6		729	FB		72A	FE		72B	FB
	7A8	FF		7A9	BE		7AA	BF		7AB	FF
	518	B6		519	C1		51A	C0		51B	F7
A/C Ç (capital C with cedilla)	42C	F1	A/D £ (pound sign)	42D	9B	A/E ← (leftward arrow)	42E	F7	A/F § (section sign)	42F	FF
	4AC	FF		4AD	EF		4AE	FF		4AF	F5
	52C	AE		52D	B9		52E	E3		52F	AA
	5AC	FF		5AD	E6		5AE	FF		5AF	FF
	62C	AE		62D	DB		62E	D5		62F	AA
	6AC	DF		6AD	BE		6AE	FF		6AF	FF
	72C	AE		72D	FB		72E	F7		72F	AA
	7AC	FF		7AD	BE		7AE	FF		7AF	D7
	51C	EE		51D	DD		51E	F7		51F	FF

Note: 1) This table is of C' = A and R' = 0 to F.

2) Addresses and data are expressed in hexadecimal.

Fig. 20 C.G. Address Table

C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data
B/0 ä	430	DF	B/1 ä° (small a with ring)	431	DF	B/2 ë (small e with grave accent)	432	C7	B/3 é (small e with acute)	433	C7
	4B0	AE		4B1	AF		4B2	BB		4B3	BB
	530	FB		531	F9		532	EF		533	EF
	5B0	AF		5B1	AE		5B2	BA		5B3	BB
	630	FB		631	FB		632	ED		633	ED
	6B0	AF		6B1	AE		6B2	BB		6B3	BA
	730	FB		731	F9		732	EF		733	EF
	7B0	C6		7B1	C7		7B2	BB		7B3	BB
	590	BF		591	BF		592	E7		593	E7
B/4 ù	434	FF	B/5 ü	435	FF	B/6 ö	436	FF	B/7 ï	437	FF
	4B4	C3		4B5	C2		4B6	C7		4B7	FE
	534	FF		535	FF		536	BA		537	FD
	5B4	BE		5B5	BF		5B6	FF		5B7	FF
	634	FD		635	FF		636	BB		637	85
	6B4	BF		6B5	BF		6B6	FF		6B7	FF
	734	FF		735	FF		736	BA		737	FF
	7B4	C3		7B5	C2		7B6	C7		7B7	FF
	594	BF		595	BF		596	FF		597	FF
B/8 æ (small æ diphthong)	438	CB	B/9 ø (small o with slash)	439	F7	B/A ij (small ij ligature)	43A	85	B/B ↓ (downward arrow)	43B	F7
	4B8	BF		4B9	AB		4BA	FF		4BB	FF
	538	EB		539	DD		53A	FF		53B	EF
	5B8	BF		5B9	EF		5BA	FF		5BB	FF
	638	C7		639	D5		63A	DF		63B	C1
	6B8	FB		6B9	FB		6BA	BF		6BB	FF
	738	AF		739	DD		73A	FF		73B	EF
	7B8	FB		7B9	EA		7BA	BF		7BB	FF
	598	A7		599	F7		59A	C5		59B	F7
B/C ß	43C	83	B/D □ (over line)	43D	FE	B/E → (rightward arrow)	43E	F7	B/F □ (upward dot)	43F	FF
	4BC	FD		4BD	FF		4BE	FF		4BF	FF
	53C	FE		53D	FE		53E	F7		53F	FF
	5BC	DF		5BD	FF		5BE	FF		5BF	FC
	63C	B6		63D	FE		63E	D5		63F	FF
	6BC	FF		6BD	FF		6BE	FF		6BF	FC
	73C	B6		73D	FE		73E	E3		73F	FF
	7BC	C9		7BD	FF		7BE	FF		7BF	FF
	59C	FF		59D	FE		59E	F7		59F	FF

Note: 1) This table is of C' = B and R' = 0 to F.

2) Addresses and data are expressed in hexadecimal.

Fig. 21 C.G. Address Table

C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data
C/0	440	FF	C/1	441	FF	C/2	442	FF	C/3	443	FF
	4C0	FF		4C1	FF		4C2	FF		4C3	FF
	540	FF		541	FF		542	FF		543	FF
	5C0	FF		5C1	FF		5C2	FF		5C3	FF
	640	FF		641	FF		642	FF		643	FF
	6C0	FF		6C1	FF		6C2	FF		6C3	FF
	740	FF		741	FF		742	FF		743	FF
	7C0	FF		7C1	FE		7C2	FF		7C3	FF
	610	FF		611	FF		612	FF		613	FF
C/4	444	FF	C/5	445	FF	C/6	446	FF	C/7	447	FF
	4C4	FF		4C5	FF		4C6	FF		4C7	FF
	544	FF		545	FF		546	FF		547	FF
	5C4	FF		5C5	FF		5C6	FF		5C7	FF
	644	FF		645	FF		646	FF		647	FF
	6C4	FF		6C5	FF		6C6	FF		6C7	FF
	744	FF		745	FF		746	FF		747	FF
	7C4	FF		7C5	FF		7C6	FF		7C7	FF
	614	FF		615	FF		616	FF		617	FF
C/8	448	FF	C/9	449	FF	C/A	44A	FF	C/B	44B	FF
	4C8	FF		4C9	FF		4CA	FF		4CB	FF
	548	FF		549	FF		54A	FF		54B	FF
	5C8	FF		5C9	FF		5CA	FF		5CB	FF
	648	FF		649	FF		64A	FF		64B	FF
	6C8	FF		6C9	FF		6CA	FF		6CB	FF
	748	FF		749	FF		74A	FF		74B	FF
	7C8	FF		7C9	FF		7CA	FF		7CB	FF
	618	FF		619	FF		61A	FF		61B	FF
C/C	44C	FF	C/D	44D	FF	C/E	44E	FF	C/F	44F	FF
	4CC	FF		4CD	FF		4CE	FF		4CF	FF
	54C	FF		54D	FF		54E	FF		54F	FF
	5CC	FF		5CD	FF		5CE	FF		5CF	FF
	64C	FF		64D	FF		64E	FF		64F	FF
	6CC	FF		6CD	FF		6CE	FF		6CF	FF
	74C	FF		74D	FF		74E	FF		74F	FF
	7CC	FF		7CD	FF		7CE	FF		7CF	FF
	61C	FF		61D	FF		61E	FF		61F	FF

Note: 1) This table is of C' = C and R' = 0 to F.

2) Addresses and data are expressed in hexadecimal.

Fig. 22 C.G. Address Table

C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data
D/0	450	FF	D/1	451	FF	D/2	452	FF	D/3	453	FF
	4D0	FF		4D1	FF		4D2	FF		4D3	FF
	550	FF		551	FF		552	FF		553	FF
	5D0	FF		5D1	FF		5D2	FF		5D3	FF
	650	FF		651	FF		652	FF		653	FF
	6D0	FF		6D1	FF		6D2	FF		6D3	FF
	750	FF		751	FF		752	FF		753	FF
	7D0	FF		7D1	FF		7D2	FF		7D3	FF
	690	FF		691	FF		692	FF		693	FF
D/4	454	FF	D/5	455	FF	D/6	456	FF	D/7	457	FF
	4D4	FF		4D5	FF		4D6	FF		4D7	FF
	554	FF		555	FF		556	FF		557	FF
	5D4	FF		5D5	FF		5D6	FF		5D7	FF
	654	FF		655	FF		656	FF		657	FF
	6D4	FF		6D5	FF		6D6	FF		6D7	FF
	754	FF		755	FF		756	FF		757	FF
	7D4	FF		7D5	FF		7D6	FF		7D7	FF
	694	FF		695	FF		696	FF		697	FF
D/8	458	FF	D/9	459	FF	D/A	45A	FF	D/B	45B	FF
	4D8	FF		4D9	FF		4DA	FF		4DB	FF
	558	FF		559	FF		55A	FF		55B	FF
	5D8	FF		5D9	FF		5DA	FF		5DB	FF
	658	FF		659	FF		65A	FF		65B	FF
	6D8	FF		6D9	FF		6DA	FF		6DB	FF
	758	FF		759	FF		75A	FF		75B	FF
	7D8	FF		7D9	FF		7DA	FF		7DB	FF
	698	FF		699	FF		69A	FF		69B	FF
D/C	45C	FF	D/D	45D	FF	D/E	45E	FF	D/F	45F	FF
	4DC	FF		4DD	FF		4DE	FF		4DF	FF
	55C	FF		55D	FF		55E	FF		55F	FF
	5DC	FF		5DD	FF		5DE	FF		5DF	FF
	65C	FF		65D	FF		65E	FF		65F	FF
	6DC	FF		6DD	FF		6DE	FF		6DF	FF
	75C	FF		75D	FF		75E	FF		75F	FF
	7DC	FF		7DD	FF		7DE	FF		7DF	FF
	69C	FF		69D	FF		69E	FF		69F	FF

Note: 1) This table is of C' = D and R' = 0 to F.
 2) Addresses and data are expressed in hexadecimal.

Fig. 23 C.G. Address Table

C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data
E/0  (grave accent)	460	FF	E/1 a	461	DF	E/2 b	462	FF	E/3 c	463	C7
	4E0	FF		4E1	AF		4E2	80		4E3	BB
	560	FF		561	FB		562	FF		563	FF
	5E0	FE		5E1	AF		5E2	BB		5E3	BB
	660	FD		661	FB		662	FF		663	FF
	6E0	FF		6E1	AF		6E2	BB		6E3	BB
	760	FF		761	FB		762	FF		763	FF
	7E0	FF		7E1	C7		7E2	BB		7E3	BB
	710	FF		711	BF		712	C7		713	F7
E/4 d	464	C7	E/5 e	465	C7	E/6 f	466	FF	E/7 g	467	F3
	4E4	BB		4E5	BB		4E6	FB		4E7	ED
	564	FF		565	EF		566	FF		567	BF
	5E4	BB		5E5	BB		5E6	81		5E7	ED
	664	FF		665	EF		666	FE		667	BF
	6E4	BB		6E5	BB		6E6	FB		6E7	ED
	764	FF		765	EF		766	FE		767	BF
	7E4	80		7E5	BB		7E6	FB		7E7	C1
	714	FF		715	E7		716	FE		717	FF
E/8 h	468	FF	E/9 i	469	FF	E/A j	46A	FF	E/B k	46B	FF
	4E8	80		4E9	FF		4EA	FF		4EB	80
	568	FF		569	B7		56A	DF		56B	FF
	5E8	F7		5E9	FF		5EA	BF		5EB	EF
	668	FF		669	85		66A	FB		66B	FF
	6E8	FB		6E9	FF		6EA	BF		6EB	E7
	768	FF		769	BF		76A	C2		76B	DF
	7E8	FB		7E9	FF		7EA	FF		7EB	BB
	718	87		719	FF		71A	FF		71B	FF
E/C l	46C	FF	E/D m	46D	87	E/E n	46E	FB	E/F o	46F	FF
	4EC	FF		4ED	FF		4EE	87		4EF	C7
	56C	BE		56D	FB		56E	FF		56F	BB
	5EC	FF		5ED	F7		5EE	F7		5EF	FF
	66C	80		66D	8F		66E	FF		66F	BB
	6EC	FF		6ED	F7		6EE	FB		6EF	FF
	76C	BF		76D	FB		76E	FF		76F	BB
	7EC	FF		7ED	FF		7EE	FB		7EF	C7
	71C	FF		71D	87		71E	87		71F	FF

- Note: 1) This table is of C' = E and R' = 0 to F.
 2) Addresses and data are expressed in hexadecimal.
 3) The characters and symbols in this table are for 8 LPI.

Fig. 24 C.G. Address Table

C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data	C'/R'	Address	Write data
F/0 p	470	FF	F/1 q	471	F3	F/2 r	472	FF	F/3 s	473	F7
	4F0	81		4F1	ED		4F2	FF		4F3	AB
	570	FF		571	FF		572	FB		573	FF
	5F0	ED		5F1	ED		5F2	87		5F3	AB
	670	FF		671	FF		672	FF		673	FF
	6F0	ED		6F1	ED		6F2	FB		6F3	AB
	770	FF		771	FF		772	FF		773	FF
	7F0	ED		7F1	81		7F2	FB		7F3	AB
	790	FB		791	FF		792	F7		793	DF
F/4 t	474	FB	F/5 u	475	FF	F/6 v	476	FB	F/7 w	477	C3
	4F4	FF		4F5	C3		4F6	F7		4F7	BF
	574	C0		575	FF		576	EF		577	DF
	5F4	BF		5F5	BF		5F6	DF		5F7	EF
	674	FB		675	FF		676	BF		677	F7
	6F4	BF		6F5	BF		6F6	DF		6F7	EF
	774	DB		775	FF		776	EF		777	DF
	7F4	FF		7F5	C3		7F6	F7		7F7	BF
	794	FF		795	BF		796	FB		797	C3
F/8 x	478	FF	F/9 y	479	BF	F/A z	47A	FF	F/B	47B	FF
	4F8	BB		4F9	FD		4FA	BB		4FB	FF
	578	D7		579	BB		57A	DF		57B	FF
	5F8	EF		5F9	D7		5FA	BB		5FB	FF
	678	FF		679	EF		67A	EF		67B	FF
	6F8	EF		6F9	F7		6FA	BB		6FB	FF
	778	D7		779	FB		77A	F7		77B	FF
	7F8	BB		7F9	FD		7FA	BB		7FB	FF
	798	FF		799	FF		79A	FF		79B	FF
F/C (comma)	47C	FF	F/D (colon)	47D	FF	F/E (semi colon)	47E	FF	F/F (underline)	47F	BF
	4FC	EF		4FD	FF		4FE	FF		4FF	FF
	57C	BF		57D	FF		57E	FF		57F	BF
	5FC	CF		5FD	C9		5FE	E9		5FF	FF
	67C	FF		67D	FF		67E	BF		67F	BF
	6FC	FF		6FD	C9		6FE	C9		6FF	FF
	77C	FF		77D	FF		77E	FF		77F	BF
	7FC	FF		7FD	FF		7FE	FF		7FF	FF
	79C	FF		79D	FF		79E	FF		79F	BF

- Note: 1) This table is of C' = F and R' = 0 to F.
 2) Addresses and data are expressed in hexadecimal.
 3) The characters and symbols in this table are for 8 LPI.

Fig. 25 C.G. Address Table

20	21	22	23	24	25	26	27
	!(Exclamation mark)	*(Quotation mark)	##(Number sign)	\$(Dollar sign)	%(Percent)	&(Ampersand)	'(Apostrophe)
28	29	2A	2B	2C	2D	2E	2F
(Round bracket open)	(Round bracket close)	*(Asterisk)	+(Plus sign)	,(Comma)	-(Hyphen)	*(Period)	/(Virgule)
30	31	32	33	34	35	36	37
0(ZERO)	1	2	3	4	5	6	7
38	39	3A	3B	3C	3D	3E	3F
8	9	:(Colon)	;(Semicolon)	<(Angle bracket open)	=(Equal sign)	>(Angle bracket close)	?(Question mark)
40	41	42	43	44	45	46	47
@(Unit price (at))	A	B	C	D	E	F	G
48	49	4A	4B	4C	4D	4E	4F
H	I	J	K	L	M	N	O

Note: Numbers given above are expressed in hexadecimal.

Fig. 26 C.G. Dot Pattern Table

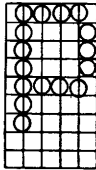
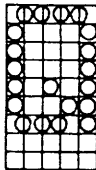
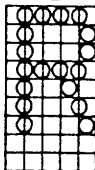
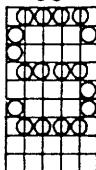
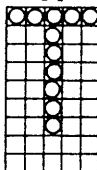
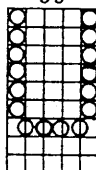
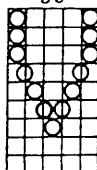
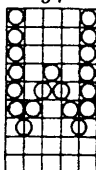
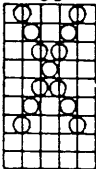
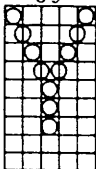
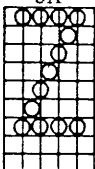
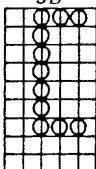
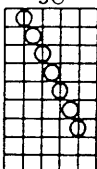
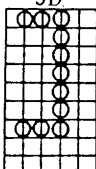
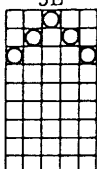
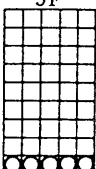
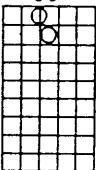
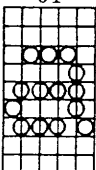
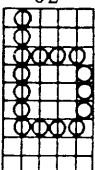
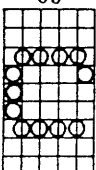
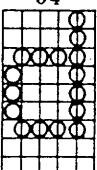
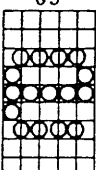
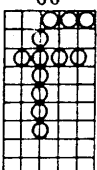
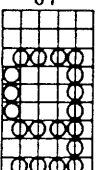
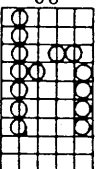
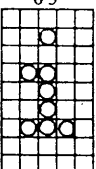
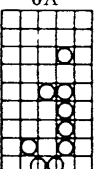
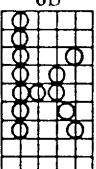
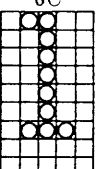
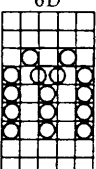
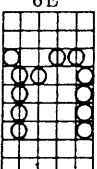
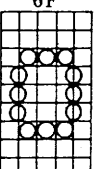
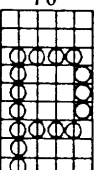
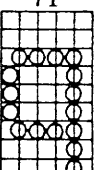
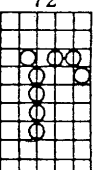
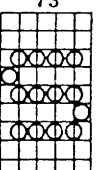
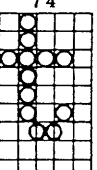
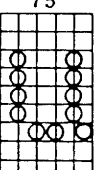
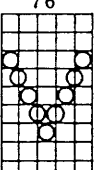
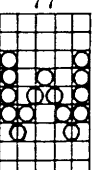
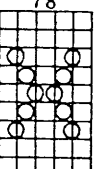
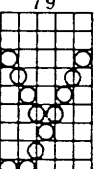
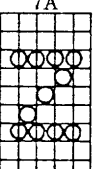
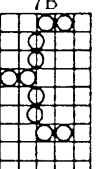
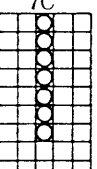
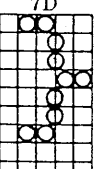
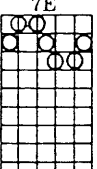
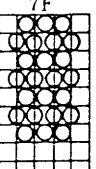
50  P	51  Q	52  R	53  S	54  T	55  U	56  V	57  W
58  X	59  Y	5A  Z	5B  [(Square bracket open)	5C  ^(Inverted virgule)	5D  j(Square bracket close)	5E  ^ (Circumflex)	5F  _ (Underline)
60  ` (Grave accent)	61  a	62  b	63  c	64  d	65  e	66  f	67  g
68  h	69  i	6A  j	6B  k	6C  l	6D  m	6E  n	6F  o
70  p	71  q	72  r	73  s	74  t	75  u	76  v	77  w
78  x	79  y	7A  z	7B  { (Brace open)	7C  	7D  } (Brace close)	7E  ~ (Swung dash)	7F  (DEL mark (deletion))

Fig. 27 C.G. Dot Pattern Table

A0 	A1 	A2 	A3 	A4 	A5 	A6 	A7
Ä 	Å 	à 	É 	ê 	Û 	Ö 	ò
Æ 	ø 	IJ 	↑ 	£ 	£ (Pound sign) 	← 	§ (Section sign)
B0 	B1 	B2 	B3 	B4 	B5 	B6 	B7
ä 	å 	è 	é 	ù 	ü 	ö 	ï
B8 	B9 	BA 	BB 	BC 	BD 	BE 	BF
æ 	φ 	ij 	↓ 	β 	- 	→ 	//

Fig. 28 C.G. Dot Pattern Table

E0 (Grave accent)	E1 a	E2 b	E3 c	E4 d	E5 e	E6 f	E7 *
E8 h	E9 i	EA *	EB k	EC l	ED m	EE n	EF o
F0 *	F1 *	F2 r	F3 s	F4 t	F5 u	F6 v	F7 w
F8 x	F9 *	FA z	FB 	FC , (Comma)	FD : (Colon)	FE ; (Semicolon)	FF - (Under- line)

Note: Those five characters indicated by * are DESCENDER characters for 8 LPI mode printing.

Fig. 29 C.G. Dot Pattern Table