

This chapter describes the communications procedure between the Commodore C 64/128 and the printer connected to it through the serial interface cable.

After briefly reviewing a few commands of the Commodore BASIC language, it will be described how to properly program the printer, settings, thus enabling it to understand the control codes sent by the host computer.

The Commodore control codes used to obtain graphics layout, paper feed, format control, miscellaneous, graphics printing and Down Line Loading functions are described in detail.

NOTES ON THE COMMODORE BASIC LANGUAGE

To make the reading of this chapter easier, some of the Commodore BASIC commands used to communicate with the printer are briefly reviewed below.

In Commodore BASIC, an application program uses the OPEN, PRINT # and CLOSE commands to access the devices connected to the Commodore C 64/128.

The OPEN command allows the computer to access devices such as the disk drive, the video display unit, and in our case the printer. The OPEN word is followed by a logic file number (referred to by the other BASIC instructions) and by a device number. The printer device number can be 4 or 5.

A third number, called "secondary address", can also be present. This number will be discussed in the next section.

Each open file must be closed after completion of the related operations. The command to be used to close a file is the CLOSE command. The CLOSE word is followed by the logic file number to be closed.

To communicate with the printer, one or more PRINT # commands are used, included between an OPEN and a CLOSE command. The PRINT # word is followed by the logic file number previously opened, by a comma, by a list of printer control codes that specify the usage of special effects, such as spacings, tab stops, graphic diagrams, etc., and by the characters to be printed.

The simple example below asks the printer to print the word "Good morning", in normal characters first and in double width characters afterwards.

```
10 OPEN1,4
20 PRINT #1,"Good morning"
30 PRINT #1,CHR$(14),"Good morning"
40 CLOSE1
```

Secondary Address

The secondary address is an optional parameter of the OPEN command. It allows to perform the printer control functions described in the following table:

n	Function
0	Capital case/Graphics character set selection
7	Lower/Capital case character set selection (see the "CRSR DWN" code further in this chapter)

If in an OPEN command the secondary address is not specified, the value "0" is automatically assumed.

PRINTER OPERATING MODES

The printer, connected to the Commodore C 64/128 through the serial interface cable, can operate in two modes, according to the program used by the host computer:

- Commodore mode, where the printer recognizes just its own control code set (see the section "Commodore Control Codes" further on in this chapter)
- Combined mode, where the printer recognizes both Commodore control codes and IBM Graphics Printer, IBM Proprinter and Epson FX 80 control codes.

To preset the printer in one of the two operating modes, the appropriate value is to be assigned to the **OPEN MODE** parameter, during the printer settings programming phase described in Chapter 7. The **OPEN MODE** parameter is referred to the **OPEN** command of the Commodore BASIC language, discussed in the first section of this chapter. The **OPEN MODE** parameter establishes a correspondance between the printer address specified by the **OPEN** command (as previously mentioned, this address can be 4 or 5) and the following control codes sets:

- Commodore set
- IBM Graphics Printer set
- IBM Proprinter set
- Epson FX 80 set.



It is essential to establish a correct correspondance according to the control codes set to be used, to avoid printer malfunctions caused by an improper printer software configuration. To this purpose, perform the instructions of the following two sections carefully.

Commodore Mode Setting

To set the printer for Commodore mode operation, the following selection is to be performed when programming the machine settings:

OPEN MODE 5 = COMMODORE COMMANDS
4 = COMMODORE COMMANDS

In this way, the control codes sent to the printer are always interpreted as Commodore control codes, independently of the address (4 or 5) they are referring.

The Commodore control codes are described further on in this chapter.

Combined Mode Setting

To set the printer for mixed mode operation, the following selection is to be performed when programming the machine settings:

OPEN MODE 5 = COMMODORE COMMANDS
4 = PC COMMANDS

In this way, the control codes sent to the printer, referring to address 5, are interpreted as Commodore control codes, while the control codes that are referring to address 4 are interpreted as control codes of the set selected with the "PRINTED EMULATED IN PARALLEL AND SERIAL COMMODORE" selection, that is:

- IBM G.P. for the IBM Graphics Printer control code set
- Epson FX 80 for the Epson FX 80 control code set
- Proprinter for the IBM Proprinter control code set

With this setting, the printer operates in combined mode: it recognizes its own Commodore control code set on channel 5, and it emulates one of the printers listed on the previous page on channel 4.

The Commodore control codes are described further on in this chapter, while the control codes in IBM Proprinter emulation are covered in Chapter 14, and the control codes in IBM Graphics Printer and Epson FX 80 emulation are described in Chapter 15.

CONTROL CODES AND ESCAPE SEQUENCES

In Commodore mode, host computer and printer interact using an extended version of the ASCII code system, known as Commodore ASCII version (or PETASCII). This version includes additional characters and control codes with respect to the ASCII set and is divided in two code tables: one for Capital case/Graphics mode and one for Lower/Capital case.

As already explained in this chapter, to use the Capital case/Graphics mode, a secondary address of "0" is to be specified (default). A secondary address of "7" specifies the Capital/Lower case mode.

Chapter 10 includes the national character tables printed out in both Capital case/Graphics and Capital/Lower case modes. These tables are composed of 256 locations (in the decimal range 0 - 255) to encode printable characters, such as letters, numbers, graphic symbols, and to encode a number of control codes, that are non printable characters but are instructions for the printer. For instance, the decimal code 14 is interpreted by the printer as a command to set the double width printing.

To increase the capability of interaction between host computer and printer, **Escape sequences** are used. The ESC code (decimal 27) indicates to the printer that the code following it is not a character to be printed, but a control code. For instance, when the printer receives the 45 decimal code, the "-" sign is printed; but, if the code 45 is preceded by decimal 27, the "underline" print mode is set.

The Commodore control codes and Escape sequences described in the remaining parts of this chapter are grouped according to the performed functions, as follows:

- Graphics layout
- Paper feed
- Format control
- Miscellaneous
- Graphics printing
- Down Line Loading (DLL) of special characters.

The description of each command includes:

- character image according to the Capital/Lower case mode tables (secondary address = 7)
- function performed by the command
- an example in Commodore BASIC.

A summary table of all Commodore commands is available in Appendix E.



All the examples described in this chapter specify the secondary address 7 with the OPEN command, so that the characters are printed in Capital/Lower case. If the secondary address of “7” is not specified, program listings are printed in Capital case/Graphics mode, as the printer automatically assumes the 0 value (0 = Capital case/Graphics character set selection) if the secondary address is not specified in the OPEN command.

Graphics Layout

ESC g Sets the “Double Strike“ print mode. Printing is performed in two passes: after the first pass, the paper advances of one elementary line spacing (1/216“).

```
10 OPEN1,4,7
20 PRINT #1,CHR$(27);CHR$(71);
30 CLOSE1
```

ESC h Clears the “Double Strike“ print mode, returning to the normal print mode.

```
10 OPEN1,4,7
20 PRINT #1,CHR$(27);CHR$(72);
30 CLOSE1
```

EN ON Sets the “Double Width“ print mode (“Enhanced On“). It is cleared by EN OFF (“Enhanced Off“).

```
10 OPEN1,4,7
20 PRINT #1,CHR$(14);
30 CLOSE1
```

EN OFF Clears the “Double Width“ print mode (“Enhanced Off“).

```
10 OPEN1,4,7
20 PRINT #1,CHR$(15);
30 CLOSE1
```

RVS ON Sets the “Reverse“ print mode. Printed characters are white on a black background, instead of black on a white background.

```
10 OPEN1,4,7
20 PRINT #1,CHR$(18);
30 CLOSE1
```

RVS OFF Clears the “Reverse“ print mode.

```
10 OPEN1,4,7
20 PRINT #1,CHR$(146);
30 CLOSE1
```

ESC - 1 Sets the “Underline“ print mode for all characters and blanks following the command. It is cleared by ESC - 0.

```
10 OPEN1,4,7
20 PRINT #1,CHR$(27);CHR$(45);CHR$(49);
30 CLOSE1
```

ESC - 0 Clears the “Underline“ print mode.

```
10 OPEN1,4,7
20 PRINT #1,CHR$(27);CHR$(45);CHR$(48);
30 CLOSE1
```

ESC e Sets the “Emphasized“ print mode. Characters are printed twice and printing is performed at half speed.

```
10 OPEN1,4,7
20 PRINT #1,CHR$(27);CHR$(69);
30 CLOSE1
```

ESC [n Sets character printing with variable spacing according to the value “n“, as for the following table.

n	Spacing	
0	Pica	10 Chars/Inch
1	Elite	12 Chars/Inch
2	Micro	15 Chars/Inch
3	Condensed	17.1 Chars/Inch
4	Compressed Pica	20 Chars/Inch
5	Compressed Elite	24 Chars/Inch
6	Compressed Micro	30 Chars/Inch

```
10 OPEN1,4,7
20 PRINT #1,CHR$(27);CHR$(91);CHR$(n);
30 CLOSE1
```

- ESC f** Clears the “Emphasized“ print mode set by ESC e.
- ```
10 OPEN1,4,7
20 PRINT #1,CHR$(27);CHR$(70);
30 CLOSE1
```
- ESC i n** Selects the print definition according to parameter n:
- n = 0 Draft print definition and normal characters
  - n = 2 High print definition (NLQ) and normal characters
  - n = 4 Normal print definition and special characters generated by Down Line Loading (DLL) by means of the ESC = control code
  - n = 6 High print definition (NLQ) and special characters generated by DLL
- ```
10 OPEN1,4,7
20 PRINT #1,CHR$(27);CHR$(73);CHR$(n);
30 CLOSE1
```
- ESC s 0** Sets the “Superscript“ print mode. Characters are half height with respect to normal printing and are printed in the upper half line.
- ```
10 OPEN1,4,7
20 PRINT #1,CHR$(27);CHR$(83);CHR$(48);
30 CLOSE1
```
- ESC s 1** Sets the “Subscript“ print mode. Characters are half height with respect to normal printing and are printed in the lower half line.
- ```
10 OPEN1,4,7
20 PRINT #1,CHR$(27);CHR$(83);CHR$(49);
30 CLOSE1
```
- ESC t** Clears the “Subscript“ and “Superscript“ print modes. If the printer had not been preset for these print modes, the command is ignored.
- ```
10 OPEN1,4,7
20 PRINT #1,CHR$(27);CHR$(84);
30 CLOSE1
```

- ESC X n** If n = 0, selects the Draft print mode  
If n = 1, selects the NLQ print mode
- 10 OPEN1,4,7  
20 PRINT # 1,CHR\$(27);CHR\$(120);CHR\$(0-1);  
30 CLOSE1
- NLQ ON** Sets the "N.L.Q." print mode.
- 10 OPEN1,4,7  
20 PRINT # 1,CHR\$(31);  
30 CLOSE1
- NLQ OFF** Clears the "N.L.Q." print mode.
- 10 OPEN1,4,7  
20 PRINT # 1,CHR\$(159);  
30 CLOSE1
- CRSR DWN** Sets the Lower/Upper case print mode for all characters. In this case, the number of available graphic characters is limited.
- 10 OPEN1,4,7  
20 PRINT # 1,CHR\$(17);  
30 CLOSE1
- CRSR UP** Sets the Upper case print mode for all characters. In this case, a greater number of graphic characters is available for printing. The printer assumes this as a default value.
- 10 OPEN1,4,7  
20 PRINT#1,CHR\$(145);  
30 CLOSE1

## Paper Feed

**LF** Causes the printout of the buffer and advances the paper of one vertical spacing, taking the print head carriage at the first column.

```
10 OPEN1,4,7
20 PRINT #1,CHR$(10);
30 CLOSE1
```

**CR** Causes the printout of the buffer and advances the paper of one vertical spacing, taking the print head carriage at the first column.

```
10 OPEN1,4,7
20 PRINT #1,CHR$(13);
30 CLOSE1
```

**FF** Causes the printout of the buffer and advances the paper to the first line of the following page (Top of Form).

```
10 OPEN1,4,7
20 PRINT #1,CHR$(12);
30 CLOSE1
```

## Format Control

**ESC c n** Sets the form length in number of vertical spacings (lines); the vertical spacing value is the one previously selected.

```
10 OPEN1,4,7
20 PRINT #1,CHR$(27);CHR$(67);CHR$(1 ÷ 127);
30 CLOSE1
```

**ESC c NUL n** Sets the form length in number of inches (from 1 to 22). At power up, the form length is the one selected during the initial programming phase.

```
10 OPEN1,4,7
20 PRINT #1,CHR$(27);CHR$(67);CHR$(0);CHR$(1 - 22);
30 CLOSE1
```

**ESC n m** Sets the number of “m” line spacings at the bottom of form that must not be used for printing and are to be automatically skipped (BOF = Bottom of Form).

```
10 OPEN1,4,7
20 PRINT # 1,CHR$(27);CHR$(78);CHR$(m);
30 CLOSE1
```



**The paper must be properly positioned at the beginning of form otherwise this command will not be executed correctly.**

**The command will have to be reissued in case the page length is modified by means of the ESC c sequence.**

**ESC o** Clears the bottom of form (BOF).

```
10 OPEN1,4,7
20 PRINT # 1,CHR$(27);CHR$(79);
30 CLOSE1
```

### Miscellaneous

**CS** Causes the printout of the buffer and takes the print head carriage at the first column of the same line.

```
10 OPEN1,4,7
20 PRINT # 1,CHR$(141);
30 CLOSE1
```

**ESC 8** Disables the “out of paper” control (printing continues down to the last line of the form).

```
10 OPEN1,4,7
20 PRINT # 1,CHR$(27);CHR$(56);
30 CLOSE1
```

**ESC 9** Enables the “out of paper” control, clearing the 1B 38 command.

```
10 OPEN1,4,7
20 PRINT # 1,CHR$(27);CHR$(57);
30 CLOSE1
```

**POS n<sub>1</sub> n<sub>2</sub>** Sets the print position movement in the current line given by n<sub>1</sub> and n<sub>2</sub> parameters in absolute value in number of characters.

Both parameters can have the value from 0 to 9.

Value 00 is assigned to first print position.

```
10 OPEN1,4,7
20 PRINT #1,CHR$(16); "This is print position 26"
30 CLOSE1
```

**ESC POS n<sub>1</sub> n<sub>2</sub>** Sets the print position movement in the current line given by n<sub>1</sub> and n<sub>2</sub> parameters in absolute value in number of dots.  
n<sub>1</sub> and n<sub>2</sub> value can be included form 0 to 480.

Example:

| n <sub>1</sub> | n <sub>2</sub> | Number of Dots  |
|----------------|----------------|-----------------|
| CHR\$(0);      | CHR\$(20)      | 0 + 20 = 20     |
| CHR\$(1);      | CHR\$(0)       | 256 + 0 = 256   |
| CHR\$(1);      | CHR\$(224)     | 256 + 224 = 480 |

```
10 OPEN1,4,7
20 PRINT #1,CHR$(27);CHR$(16);CHR$(1);CHR$(6);
 "This is position 256".
30 CLOSE1
```

## Graphics Printing

The printer can operate in graphics mode according to the Bit Image Mode (BIM). A Bit Image character is defined by means of a dot layout in a 7-line x 16-column matrix, that corresponds to the print head. The print head prints the selected graphic image operating the needles according to the dots defined in the matrix.

The printer is therefore able to produce pictures, diagrams and any type of drawing, provided that the dot position is appropriately defined.

This section describes the creation of a BIM graphic image and the commands required to enter the graphics mode, to set the repeated printing of Bit Image characters and to exit the graphics mode.

### Generating a BIM Graphic Image

To generate a BIM graphic image, perform the steps described in the following example:

1. On a sheet of paper, trace a grid similar to the one in the picture below (7 line x 16 columns):

|    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1  | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 2  | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 4  | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 8  | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 16 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 32 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 64 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

2. Using a pencil, darken the dots according to the desired image, as shown:

|    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 |   |
|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1  | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 2  | ○ | ○ | ● | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 4  | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 8  | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 16 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 32 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 64 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

3. For each column, add the numbers corresponding to the dots to be printed. For instance, in the second column, two dots are present, one in the row defined as 4 and one in the row defined as 16. The column value is therefore 20 (16 + 4). Performing this computation for each column, 16 weights are obtained that will be used to print the graphic image.

4. To each weight obtained according to the instructions in step 3, add the value 128. The value of the second column will now be 148 (20 + 128). The values thus obtained will be used by the instructions to produce the graphics image.

## Entering the Graphics Mode

**BIT IMG** Sets the BIM graphics printing. In graphics mode, printing is performed in Double Width.

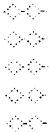


**In graphics mode, vertical spacing is automatically set at 7/72“.**

The following example performs the printing of the graphics image generated in the preceding section. The printing is performed five times.

```
10 OPEN1,4,7
20 A$ = " "
30 FOR I=1 TO 16
40 READ A:A$ = A$ + CHR$(A)
50 NEXT I
60 FOR J=1 TO 5
70 PRINT #1,CHR$(8);A$
80 NEXT J
90 FOR K=1 TO 8:PRINT #1:NEXT K
100 CLOSE1
110 END
200 DATA 136, 148, 162, 193, 162, 148, 136, 136
210 DATA 148, 162, 193, 162, 148, 136, 136, 136
```

Result:





## Exiting the Graphics Mode

**EN ON** Causes the exit from the graphics mode, but the printer remains set for the Double Width print mode.

```
10 OPEN1,4,7
20 PRINT #1,CHR$(14);
30 CLOSE1
```

To clear the Double Width print mode and to set the normal printing in Draft mode, use the EN OFF command.

```
10 OPEN1,4,7
20 PRINT #1,CHR$(15);
30 CLOSE1
```

## Down Line Loading of Special Characters

The user can create from 1 to 94 personalized characters; these characters can be printed in the place of the normal characters.

The down line loading of the special characters (DLL = Down Line Loading) in the printer memory is performed through the ESC = code. If less than 94 characters are loaded, all the character codes must be in sequence, starting from the first code.

**ESC =** This code must be followed by the parameters **m n c a p<sub>1</sub> p<sub>2</sub>...p<sub>11</sub>**, that are the decimal codes of variable bytes according to the characters to be loaded. Each ESC = command can load a maximum of 256 subsequent characters.

```
10 OPEN1,4,7
20 PRINT#1,CHR$(27);"=";parameters
30 CLOSE1
```

The parameters meaning is as follows:

**m and n**

Specify the total number of data to be loaded in the printer memory.

1. To compute the number of data to be loaded (t), use the following formula:

$$t = (\text{number of characters} \times 13) + 2$$

2. If the number of data to be loaded is less than 256:  $m = t$  and  $n = 0$ .

Example: For two characters:

$$t = (2 \times 13) + 2 = 28$$

$$m = 28$$

$$n = 0$$

3. If the number of data to be loaded is greater than 256:  $m = \text{remainder}$  and  $n = \text{integral quotient}$ .

Example: For 94 characters:

$$t = (94 \times 13) + 2 = 1224$$

$$1224/256 = 4$$

$$m = 200 (1224 - (256 \times 4))$$

$$n = 4 (\text{quotient of division } 1224 \text{ by } 256).$$

**c**

This is the decimal code of the first character to be loaded. Standard characters will be replaced by the personalized characters starting from this point.

Example: A character set is to be loaded to replace the characters starting from the upper case "A" letter:

$$c = 65 (\text{ASCII decimal code for letter A})$$

Characters can be loaded starting from decimal code 33 up to 126 included. Characters to be loaded must be subsequent starting from code "c".

- a** This parameter indicates if the character is ascending or descending:
- If  $a = 0$  printing is performed with the first 8 needles of the print head (the ninth needle, the lowest one, towards the bottom of the character, is not used)
  - If  $a = 1$  printing is performed with the last 8 needles of the print head (the first needle, the upper one, towards the top of the character, is not used).

**P<sub>1</sub> P<sub>2</sub>...P<sub>11</sub>** These are the values of the vertical columns of dots in each character.



Use the "ESC i" command, previously explained in the section "Graphics Layout" in this chapter, to print characters in Draft or N.L.Q. mode.

### Example of Particular Symbol Loading

The example illustrates the replacement of standard symbols "@" and "a" with Commodore and Copyright symbols:

```
t = (2 x 13) + 2 = 28
m = 28
n = 0
c = CHR$(64)
a = CHR$(0)
```

```
10 OPEN1,4,7
20 A$=""
30 FOR I = 1 TO 26
40 READ A:A$=A$+CHR$(A)
50 NEXT I
60 PRINT#1,CHR$(27); "="; CHR$(28); CHR$(0); CHR$(20); CHR$(64); A$;
70 PRINT#1,CHR$(27); CHR$(73); CHR$(4);
80 FOR J = 1 TO 8
90 PRINT#1,CHR$(64); " "; CHR$(65); " ";
100 NEXT J
110 PRINT#1
120 CLOSE1
130 DATA 0,0,62,0,65,0,65,0
140 DATA 65,0,54,0,34
150 DATA 0,0,60,66,0,153,165,165
160 DATA 165,129,0,66,60
```

Send data to the printer only in a PRINT instruction (see the program line 60 in the example) to load a DLL program.

As an alphanumerical variable can contain 255 data as a maximum, a DLL program composed by a greater number of 255 data must have more alphanumerical variable.

If the user wishes to load for example 55 characters with DLL, from the character address @ (64 in decimal), the line 60 becomes:

```
60 PRINT#1,CHR$(27);"=";CHR$(205);CHR$(2);CHR$(20);CHR$(64);A$;B$;C$
```

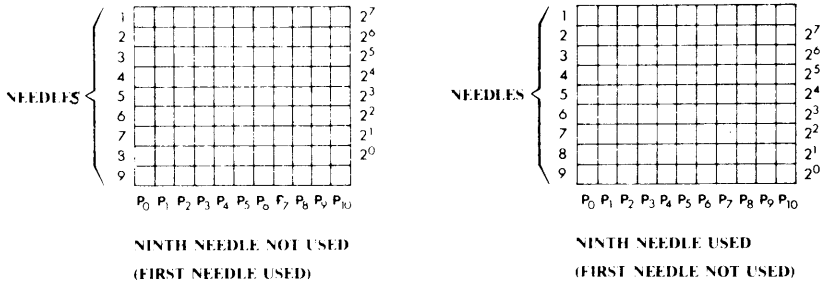
where CHR\$(205);CHR\$(2) specify the 715 data number which define 55 characters charged (55x13).

A\$ variable contains the first 255 data, B\$ variable the second 255, C\$ variable the others 205.

Obviously, data table ( ... DATA ..... ) must contain all data in the program to define 55 characters.

To draw every character, the user is provided of the following  $8 \times 11$  effective matrix:

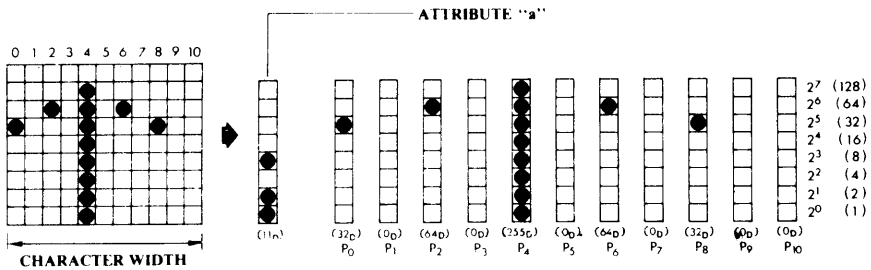
**Fig. 9-1**  
**Print Matrix**



The dot is printed if the corresponding bit in the received Byte “p” is 1.

On the  $8 \times 11$  matrix, the user can mark the print dots required to draw the character, keeping in mind that, to guarantee the recycle of the print head, a needle activated in column “n” cannot be re-activated in column “n + 1”. If the configuration sent to the printer does not comply with this rule, the printer automatically makes the configuration acceptable. In this case, however, the issued character will differ from the printed character for all the dots that would inhibit needle recycle, had they been printed.

**Fig. 9-2**  
**Example of**  
**Personalized**  
**Character Definition**



This chapter contains the national characters tables, printed in N.L.Q. for the modes:

- Upper case/Graphics  
(secondary address = 0)
- Lower/Upper case  
(secondary address = 7)

# ASCII CODE TABLE

|                |                |                |                | <table border="1"> <tr><td>b<sub>7</sub></td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td></tr> <tr><td>b<sub>6</sub></td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td></tr> <tr><td>b<sub>5</sub></td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>1</td><td>1</td></tr> <tr><td>b<sub>4</sub></td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td></tr> </table> |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   | b <sub>7</sub> | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | b <sub>6</sub> | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | b <sub>5</sub> | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | b <sub>4</sub> | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
|----------------|----------------|----------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| b <sub>7</sub> | 0              | 0              | 0              | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0 | 0 | 0  | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| b <sub>6</sub> | 0              | 0              | 0              | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1 | 1 | 1  | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| b <sub>5</sub> | 0              | 0              | 1              | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0 | 0 | 1  | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| b <sub>4</sub> | 0              | 1              | 0              | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0 | 1 | 0  | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|                |                |                |                | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1 | 2 | 3  | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| b <sub>4</sub> | b <sub>3</sub> | b <sub>2</sub> | b <sub>1</sub> | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |   |    | 0 | @ | P | - | 7 |   |   |   | r | - | 7 |   | r              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 0              | 0              | 0              | 0              | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |   | 1  | 1 | A | Q | ♠ | ● |   |   | ┌ | └ | ♣ | ● | ┌ | └              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 0              | 0              | 0              | 1              | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |   | "  | 2 | B | R |   | - |   |   | ■ | ┐ |   | - | ■ | ┐              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 0              | 0              | 1              | 0              | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |   | #  | 3 | C | S | - | ♥ |   |   | ┌ | └ | - | ♥ | ┌ | └              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 0              | 0              | 1              | 1              | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |   | \$ | 4 | D | T | - |   |   |   | - |   | - |   | - |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 0              | 1              | 0              | 0              | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |   | %  | 5 | E | U | - | / |   |   |   |   | - | / |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 0              | 1              | 0              | 1              | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |   | &  | 6 | F | V | - | x |   |   | ▩ | ▩ | - | x | ▩ | ▩              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 0              | 1              | 1              | 0              | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |   | '  | 7 | G | W |   | o |   |   |   | - |   | o |   | -              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1              | 0              | 0              | 0              | 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |   | (  | 8 | H | X |   | ♣ |   |   | ▩ | - |   | ♣ | ▩ | -              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1              | 0              | 0              | 1              | 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |   | )  | 9 | I | Y | \ |   |   |   | ▩ | - | \ |   | ▩ | -              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1              | 0              | 1              | 0              | A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |   | *  | : | J | Z | \ | ♦ |   |   |   | ┌ | \ | ♦ |   | ┌              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1              | 0              | 1              | 1              | B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |   | +  | ; | K | Æ | ' | + |   |   | ┌ | ■ | ' | + | ┌ | ■              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1              | 1              | 0              | 0              | C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |   | ,  | < | L | Ø | L | ▩ |   |   | ■ | ■ | L | ▩ | ■ | ■              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1              | 1              | 0              | 1              | D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |   | -  | = | M | Å | \ |   |   |   | ┌ | ┌ | \ |   | ┌ | ┌              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1              | 1              | 1              | 0              | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |   | .  | > | N | ↑ | / | π |   |   | ┌ | ■ | / | π | ┌ | ■              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1              | 1              | 1              | 1              | F                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |   | /  | ? | O | ← | ┐ | ▩ |   |   | - | ▩ | ┐ | ▩ | - | ▩              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

Fig. 10-1 DENMARK (Upper case/Graphics mode, Secondary address = 0)



# ASCII CODE TABLE

|                |                |                |                | b <sub>7</sub> | 0 | 0 | 0  | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
|----------------|----------------|----------------|----------------|----------------|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
|                |                |                |                | b <sub>7</sub> | 0 | 0 | 0  | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
|                |                |                |                | b <sub>6</sub> | 0 | 0 | 1  | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
|                |                |                |                | b <sub>5</sub> | 0 | 1 | 0  | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
|                |                |                |                |                | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
| b <sub>4</sub> | b <sub>3</sub> | b <sub>2</sub> | b <sub>1</sub> | 0              |   |   |    | 0 | 0 | P | ' | 7 |   |   | 6 | ' | 7 |   | 6 |   |
| 0              | 0              | 0              | 1              | 1              | 1 |   | !  | 1 | A | Q | ◄ | ◄ |   |   | l | à | ◄ | ◄ | l | à |
| 0              | 0              | 1              | 0              | 0              | 2 |   | "  | 2 | B | R | ▬ | ▬ |   |   | l | è | ▬ | ▬ | l | è |
| 0              | 0              | 1              | 1              | 0              | 3 |   | #  | 3 | C | S | ■ | ■ |   |   | l | i | ■ | ■ | l | i |
| 0              | 1              | 0              | 0              | 0              | 4 |   | \$ | 4 | D | T | ◄ | ◄ |   |   | l | ò | ◄ | ◄ | l | ò |
| 0              | 1              | 0              | 1              | 0              | 5 |   | %  | 5 | E | U | ■ | ■ |   |   | l | ù | ■ | ■ | l | ù |
| 0              | 1              | 1              | 0              | 0              | 6 |   | &  | 6 | F | V | ' | ▬ |   |   | - | â | ' | ▬ | - | â |
| 0              | 1              | 1              | 1              | 0              | 7 |   | '  | 7 | G | W | ' | ■ |   |   | l | é | ' | ■ | l | é |
| 1              | 0              | 0              | 0              | 0              | 8 |   | (  | 8 | H | X | ■ | ▬ |   |   | r | î | ■ | ▬ | r | î |
| 1              | 0              | 0              | 1              | 0              | 9 |   | )  | 9 | I | Y | ■ | ▬ |   |   | l | ô | ■ | ▬ | l | ô |
| 1              | 0              | 1              | 0              | 0              | A |   | *  | : | J | Z | ■ | ■ |   |   | l | û | ■ | ■ | l | û |
| 1              | 0              | 1              | 1              | 0              | B |   | +  | ; | K | [ | \ | ë |   |   | l | Ä | \ | ë | l | Ä |
| 1              | 1              | 0              | 0              | 0              | C |   | ,  | < | L | \ | L | ï |   |   | £ | ö | L | ï | £ | ö |
| 1              | 1              | 0              | 1              | 0              | D |   | -  | = | M | ] | / | ° |   |   | ' | ü | / | ° | ' | ü |
| 1              | 1              | 1              | 0              | 0              | E |   | .  | > | N | ↑ | ▬ | π |   |   | ^ | β | ▬ | π | ^ | β |
| 1              | 1              | 1              | 1              | 0              | F |   | /  | ? | O | ▬ | Γ | Ç |   |   | " | é | Γ | Ç | " | π |

Fig. 10-3 FRANCE (Upper case/Graphics mode, Secondary address = 0)

ascii code table

|                |                |                |                |                |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----------------|----------------|----------------|----------------|----------------|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
|                |                |                |                | b <sub>7</sub> | 0 | 0 | 0 | 0  | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |   |
|                |                |                |                | b <sub>6</sub> | 0 | 0 | 0 | 0  | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |   |
|                |                |                |                | b <sub>5</sub> | 0 | 0 | 1 | 1  | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |   |
|                |                |                |                | b <sub>4</sub> | 0 | 1 | 0 | 1  | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |   |
|                |                |                |                |                | 0 | 1 | 2 | 3  | 4 | 5 | 6 | 7 | 8 | 9 | a | b | c | d | e | f |   |
| b <sub>4</sub> | b <sub>3</sub> | b <sub>2</sub> | b <sub>1</sub> | 0              |   |   |   | 0  | à | p | ` | P |   |   | g | ` | P | g |   |   |   |
| 0              | 0              | 0              | 0              | 1              |   |   |   | 1  | a | q | A | Q |   |   | l | à | A | Q | l | à |   |
| 0              | 0              | 0              | 1              | 2              |   |   |   | "  | 2 | b | r | B | R |   |   | l | è | B | R | l | è |
| 0              | 0              | 1              | 0              | 3              |   |   |   | #  | 3 | c | s | C | S |   |   | ± | ì | C | S | ± | ì |
| 0              | 0              | 1              | 1              | 4              |   |   |   | \$ | 4 | d | t | D | T |   |   | ¸ | ò | D | T | ¸ | ò |
| 0              | 1              | 0              | 0              | 5              |   |   |   | %  | 5 | e | u | E | U |   |   | † | ù | E | U | † | ù |
| 0              | 1              | 1              | 0              | 6              |   |   |   | &  | 6 | f | v | F | V |   |   | - | â | F | V | - | â |
| 0              | 1              | 1              | 1              | 7              |   |   |   | '  | 7 | g | w | G | W |   |   | † | é | G | W | † | é |
| 1              | 0              | 0              | 0              | 8              |   |   |   | (  | 8 | h | x | H | X |   |   | r | í | H | X | r | í |
| 1              | 0              | 0              | 1              | 9              |   |   |   | )  | 9 | i | y | I | Y |   |   | τ | ò | I | Y | τ | ò |
| 1              | 0              | 1              | 0              | a              |   |   |   | *  | : | j | z | J | Z |   |   | γ | ú | J | Z | γ | ú |
| 1              | 0              | 1              | 1              | b              |   |   |   | +  | ; | k | l | K | ë |   |   | † | ä | K | ë | † | ä |
| 1              | 1              | 0              | 0              | c              |   |   |   | ,  | < | l | \ | L | ï |   |   | £ | ö | L | ï | £ | ö |
| 1              | 1              | 0              | 1              | d              |   |   |   | -  | = | m | ] | M | ° |   |   | ' | ü | M | ° | ' | ü |
| 1              | 1              | 1              | 0              | e              |   |   |   | .  | > | n | ↑ | N | π |   |   | ˆ | β | N | π | ˆ | β |
| 1              | 1              | 1              | 1              | f              |   |   |   | /  | ? | o | - | O | ç |   |   | " | é | O | ç | " | π |

Fig. 10-4 FRANCE (Upper/Lower case mode, Secondary address = 7)

# ASCII CODE TABLE

|                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| b <sub>7</sub> | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| b <sub>6</sub> | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| b <sub>4</sub> | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| b <sub>5</sub> | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |

|                |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----------------|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
|                | Ø | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
| b <sub>4</sub> | 0 | 0 | 0  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| b <sub>3</sub> | 0 | 0 | 0  | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| b <sub>2</sub> | 0 | 0 | 1  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| b <sub>1</sub> | 0 | 1 | 1  | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| b <sub>0</sub> | 0 | 0 | 0  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|                | Ø |   |    | ! | 1 | A | Q | ◄ | ◄ |   | l | µ | ◄ | ◄ | l | µ |
|                | 1 |   | "  | 2 | B | R | - | / |   |   | l | à | - | / | l | à |
|                | 2 |   | #  | 3 | C | S | ■ | ■ |   |   | l | ù | ■ | ■ | l | ù |
|                | 3 |   | \$ | 4 | D | T | ■ | ◄ |   |   | l | â | ■ | ◄ | l | â |
|                | 4 |   | %  | 5 | E | U | ■ | l |   |   | l | ê | ■ | l | l | ê |
|                | 5 |   | &  | 6 | F | V | ' | - |   |   | - | l | ' | - | l | l |
|                | 6 |   | '  | 7 | G | W | ' | ■ |   |   | l | ô | ' | ■ | l | ô |
|                | 7 |   | (  | 8 | H | X | l | - |   |   | l | û | l | ■ | l | û |
|                | 8 |   | )  | 9 | I | Y | l | - |   |   | l | ü | l | - | l | ü |
|                | 9 |   | *  | : | J | Z | l | ■ |   |   | l | Σ | l | ■ | l | Σ |
|                | A |   | +  | ; | K | [ | \ | ■ |   |   | l | Ä | \ | ■ | l | Ä |
|                | B |   | ,  | < | L | \ | l | l |   |   | l | é | ö | l | l | é |
|                | C |   | -  | = | M | ] | / | ■ |   |   | l | £ | ü | / | ■ | l |
|                | D |   | .  | > | N | ↑ | - | π |   |   | l | è | β | - | π | l |
|                | E |   | /  | ? | O | - | l | - |   |   | l | ' | l | - | ' | l |
|                | F |   |    |   |   |   |   |   |   |   | l | ' | l | - | ' | l |

Fig. 10-5 GERMANY (Upper case/Graphics mode, Secondary address = 0)

ascii code table

|                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| b <sub>7</sub> | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| b <sub>6</sub> | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| b <sub>5</sub> | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |   |
| b <sub>4</sub> | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |   |

|                |                |                |                |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----------------|----------------|----------------|----------------|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| b <sub>4</sub> | b <sub>3</sub> | b <sub>2</sub> | b <sub>1</sub> |   | Ø | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | a | b | c | d | e | f |   |
| 0              | 0              | 0              | 0              | Ø |   |   |    | Ø | g | p | ' | P |   |   | à | ` | P |   | à |   |   |
| 0              | 0              | 0              | 1              | 1 | 1 |   | !  | 1 | a | q | A | Q |   |   | ı | µ | A | Q | ı | µ |   |
| 0              | 0              | 1              | 0              | 2 |   |   | "  | 2 | b | r | B | R |   |   | ı | à | B | R | ı | à |   |
| 0              | 0              | 1              | 1              | 3 |   |   | #  | 3 | c | s | C | S |   |   | ı | ù | C | S | ı | ù |   |
| 0              | 1              | 0              | 0              | 4 |   |   | \$ | 4 | d | t | D | T |   |   | ı | â | D | T | ı | â |   |
| 0              | 1              | 0              | 1              | 5 |   |   | %  | 5 | e | u | E | U |   |   | ı | ê | E | U | ı | ê |   |
| 0              | 1              | 1              | 0              | 6 |   |   | &  | 6 | f | v | F | V |   |   | - | f | F | V | - | f |   |
| 0              | 1              | 1              | 1              | 7 |   |   | '  | 7 | g | w | G | W |   |   | ı | ô | G | W | ı | ô |   |
| 1              | 0              | 0              | 0              | 8 |   |   | (  | 8 | h | x | H | X |   |   | ı | û | H | X | ı | û |   |
| 1              | 0              | 0              | 1              | 9 |   |   | )  | 9 | i | y | I | Y |   |   | ı | √ | I | Y | ı | √ |   |
| 1              | 0              | 1              | 0              | a |   |   | *  | : | j | z | J | Z |   |   | ı | Σ | J | Z | ı | Σ |   |
| 1              | 0              | 1              | 1              | b |   |   | +  | ; | k | [ | K | Ä |   |   | ı | ä | K | Ä | ı | ä |   |
| 1              | 1              | 0              | 0              | c |   |   | ,  | < | l | \ | L | Ö |   |   | ı | é | ö | L | Ö | ı | é |
| 1              | 1              | 0              | 1              | d |   |   | -  | = | m | ] | M | Ü |   |   | ı | £ | ü | M | Ü | ı | £ |
| 1              | 1              | 1              | 0              | e |   |   | .  | > | n | ↑ | N | π |   |   | ı | è | β | N | π | ı | è |
| 1              | 1              | 1              | 1              | f |   |   | /  | ? | o | - | O | - |   |   | ı | ' | ^ | O | - | ı | ' |

Fig. 10-6 GERMANY (Upper/Lower case mode, Secondary address = 7)

|                |                |                |                |                |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----------------|----------------|----------------|----------------|----------------|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
|                |                |                |                | b <sub>1</sub> | 0 | 0 | 0  | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
|                |                |                |                | b <sub>7</sub> | 0 | 0 | 0  | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
|                |                |                |                | b <sub>6</sub> | 0 | 0 | 1  | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
|                |                |                |                | b <sub>5</sub> | 0 | 1 | 0  | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
|                |                |                |                |                | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
| b <sub>4</sub> | b <sub>3</sub> | b <sub>2</sub> | b <sub>1</sub> | 0              |   |   |    | 0 | @ | P | ` | 7 |   |   | g | ` | 7 | g |   |   |
| 0              | 0              | 0              | 0              | 1              |   |   | !  | 1 | A | Q | ▀ | ▀ |   |   | l | à | ▀ | ▀ | l | à |
| 0              | 0              | 0              | 1              | 2              |   |   | "  | 2 | B | R | ▄ | ▄ |   |   | l | è | ▄ | ▄ | l | è |
| 0              | 0              | 1              | 1              | 3              |   |   | #  | 3 | C | S | ▀ | ▀ |   |   | ± | ì | ▀ | ▀ | ± | ì |
| 0              | 1              | 0              | 0              | 4              |   |   | \$ | 4 | D | T | ▀ | ▀ |   |   | ┘ | ò | ▀ | ▀ | ┘ | ò |
| 0              | 1              | 0              | 1              | 5              |   |   | %  | 5 | E | U | ▀ | ▀ |   |   | ┘ | ù | ▀ | ▀ | ┘ | ù |
| 0              | 1              | 1              | 0              | 6              |   |   | &  | 6 | F | V | ▀ | ▀ |   |   | - | â | ▀ | ▀ | - | â |
| 0              | 1              | 1              | 1              | 7              |   |   | '  | 7 | G | W | ▀ | ▀ |   |   | + | é | ▀ | ▀ | + | é |
| 1              | 0              | 0              | 0              | 8              |   |   | (  | 8 | H | X | ▀ | ▀ |   |   | r | í | ▀ | ▀ | r | í |
| 1              | 0              | 0              | 1              | 9              |   |   | )  | 9 | I | Y | ▀ | ▀ |   |   | τ | ò | ▀ | ▀ | τ | ò |
| 1              | 0              | 1              | 0              | A              |   |   | *  | : | J | Z | ▀ | ▀ |   |   | τ | ú | ▀ | ▀ | τ | ú |
| 1              | 0              | 1              | 1              | B              |   |   | +  | ; | K | [ | ▀ | ▀ |   |   | + | Ä | ▀ | ▀ | + | Ä |
| 1              | 1              | 0              | 0              | C              |   |   | ,  | < | L | \ | L | ▀ |   |   | £ | ö | L | ▀ | £ | ö |
| 1              | 1              | 0              | 1              | D              |   |   | -  | = | M | ] | ▀ | ▀ |   |   | ' | Û | ▀ | ▀ | ' | Û |
| 1              | 1              | 1              | 0              | E              |   |   | .  | > | N | ↑ | ▀ | ▀ |   |   | ^ | β | ▀ | ▀ | ^ | β |
| 1              | 1              | 1              | 1              | F              |   |   | /  | ? | O | _ | ▀ | ▀ |   |   | " | é | ▀ | ▀ | " | é |

Fig. 10-7 ITALY (Upper case/Graphics mode, Secondary address = 0)

ascii code table

|                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| b <sub>7</sub> | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| b <sub>6</sub> | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| b <sub>5</sub> | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| b <sub>4</sub> | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |

|   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
|   | Ø | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | a | b | c | d | e | f |
| Ø |   |   |    | Ø | à | p | ` | P |   |   | g | ` | P |   | g |   |
| 1 |   |   | !  | 1 | a | q | A | Q |   |   | l | à | A | Q | l | à |
| 2 |   |   | "  | 2 | b | r | B | R |   |   | l | è | B | R | l | è |
| 3 |   |   | #  | 3 | c | s | C | S |   |   | l | ì | C | S | l | ì |
| 4 |   |   | \$ | 4 | d | t | D | T |   |   | l | ò | D | T | l | ò |
| 5 |   |   | %  | 5 | e | u | E | U |   |   | l | ù | E | U | l | ù |
| 6 |   |   | &  | 6 | f | v | F | V |   |   | - | â | F | V | - | â |
| 7 |   |   | '  | 7 | g | w | G | W |   |   | l | é | G | W | l | é |
| 8 |   |   | (  | 8 | h | x | H | X |   |   | r | î | H | X | r | î |
| 9 |   |   | )  | 9 | i | y | I | Y |   |   | l | ô | I | Y | l | ô |
| a |   |   | *  | : | j | z | J | Z |   |   | l | û | J | Z | l | û |
| b |   |   | +  | ; | k | [ | K | ë |   |   | l | ä | K | ë | l | ä |
| c |   |   | ,  | < | l | \ | L | ï |   |   | £ | ö | L | ï | £ | ö |
| d |   |   | -  | = | m | ] | M | ° |   |   | ' | ü | M | ° | ' | ü |
| e |   |   | .  | > | n | ↑ | N | π |   |   | ^ | β | N | π | ^ | β |
| f |   |   | /  | ? | o | - | O | ç |   |   | " | é | O | ç | " | π |

Fig. 10-8 ITALY (Upper/Lower case mode, Secondary address = 7)



ascii code table

|                |                |                |                |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----------------|----------------|----------------|----------------|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| b <sub>7</sub> | o              | o              | o              | o | o | o | o  | o |   |   |   |   |   |   |   |   |   |   |   |   |
| b <sub>6</sub> | o              | o              | o              | o |   |   |    |   | o | o | o | o |   |   |   |   |   |   |   |   |
| b <sub>5</sub> | o              |                | o              |   | o |   | o  |   | o |   | o |   | o |   | o |   |   |   |   |   |
| b <sub>4</sub> | b <sub>3</sub> | b <sub>2</sub> | b <sub>1</sub> | Ø | 1 | 2 | 3  | 4 | 5 | 6 | 7 | 8 | 9 | a | b | c | d | e | f |   |
| o              | o              | o              | o              | Ø |   |   |    | Ø | à | p | ` | P |   |   | ± | ` | P |   | ± |   |
| o              | o              | o              |                | 1 |   |   | !  | 1 | a | q | A | Q |   |   | l | à | A | Q | l | à |
| o              | o              |                | o              | 2 |   |   | "  | 2 | b | r | B | R |   |   | l | è | B | R | l | è |
| o              | o              |                |                | 3 |   |   | #  | 3 | c | s | C | S |   |   | ± | ♠ | C | S | ± | ♠ |
| o              |                | o              | o              | 4 |   |   | \$ | 4 | d | t | D | T |   |   | l | ò | D | T | l | ò |
| o              |                | o              |                | 5 |   |   | %  | 5 | e | u | E | U |   |   | l | ♥ | E | U | l | ♥ |
| o              |                |                | o              | 6 |   |   | &  | 6 | f | v | F | V |   |   | - | á | F | V | - | á |
| o              |                |                |                | 7 |   |   | '  | 7 | g | w | G | W |   |   | l | é | G | W | l | é |
|                | o              | o              | o              | 8 |   |   | (  | 8 | h | x | H | X |   |   | r | í | H | X | r | í |
|                | o              | o              |                | 9 |   |   | )  | 9 | i | y | I | Y |   |   | l | ó | I | Y | l | ó |
|                | o              |                | o              | a |   |   | *  | : | j | z | J | Z |   |   | l | ú | J | Z | l | ú |
|                | o              |                |                | b |   |   | +  | ; | k | [ | K | i |   |   | l | ï | K | i | l | ï |
|                |                | o              | o              | c |   |   | ,  | < | l | \ | L | ¿ |   |   | £ | ü | L | ¿ | £ | ü |
|                |                | o              |                | d |   |   | -  | = | m | ] | M | ñ |   |   | ' | ñ | M | Ñ | ' | ñ |
|                |                |                | o              | e |   |   | .  | > | n | ↑ | N | π |   |   | ♣ | ♦ | N | π | ♣ | ♦ |
|                |                |                |                | f |   |   | /  | ? | o | _ | O | Ç |   |   | " | ç | O | Ç | " | π |

Fig. 10-10 SPAIN (Upper/Lower case mode, Secondary address = 7)

ASCII CODE TABLE

| b <sub>4</sub> b <sub>3</sub> b <sub>2</sub> b <sub>1</sub> |                |                |                | b <sub>7</sub> b <sub>6</sub> b <sub>5</sub> |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-------------------------------------------------------------|----------------|----------------|----------------|----------------------------------------------|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| b <sub>4</sub>                                              | b <sub>3</sub> | b <sub>2</sub> | b <sub>1</sub> | 0                                            | 1 | 2 | 3  | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |   |
| 0                                                           | 0              | 0              | 0              | 0                                            |   |   |    | 0 | Q | P | - | 7 |   |   |   | r | - | 7 |   | r |
| 0                                                           | 0              | 0              | 1              | 1                                            |   |   | 1  | A | Q | ♠ | ● |   |   |   | ↑ | ♠ | ● |   | ↑ |   |
| 0                                                           | 0              | 1              | 0              | 2                                            |   |   | 2  | B | R |   | - |   |   | ▀ | ↑ |   | - | ▀ | ↑ |   |
| 0                                                           | 0              | 1              | 1              | 3                                            |   |   | #  | 3 | C | S | - | ♥ |   | ▀ | ↑ | - | ♥ | ▀ | ↑ |   |
| 0                                                           | 1              | 0              | 0              | 4                                            |   |   | \$ | 4 | D | T | - |   |   | - |   | - |   | - |   |   |
| 0                                                           | 1              | 0              | 1              | 5                                            |   |   | %  | 5 | E | U | - | / |   |   |   | - | / |   |   |   |
| 0                                                           | 1              | 1              | 0              | 6                                            |   |   | &  | 6 | F | V | - | × |   | ⊠ |   | - | × | ⊠ |   |   |
| 0                                                           | 1              | 1              | 1              | 7                                            |   |   | '  | 7 | G | W |   | o |   |   | - |   | o |   | - |   |
| 1                                                           | 0              | 0              | 0              | 8                                            |   |   | (  | 8 | H | X |   | ♣ |   | ⊠ | - |   | ♣ | ⊠ | - |   |
| 1                                                           | 0              | 0              | 1              | 9                                            |   |   | )  | 9 | I | Y | ~ |   |   | ▀ | ▀ | ~ |   | ▀ | ▀ |   |
| 1                                                           | 0              | 1              | 0              | A                                            |   |   | *  | : | J | Z | ~ | ♦ |   |   | ▀ | ~ | ♦ |   | ▀ |   |
| 1                                                           | 0              | 1              | 1              | B                                            |   |   | +  | : | K | Ä | ~ | + |   | † | ▀ | ~ | + | † | ▀ |   |
| 1                                                           | 1              | 0              | 0              | C                                            |   |   | ,  | < | L | Ö | L | ⊠ |   | ▀ | ▀ | L | ⊠ | ▀ | ▀ |   |
| 1                                                           | 1              | 0              | 1              | D                                            |   |   | -  | = | M | Ä | ~ |   |   | ▀ | ▀ | ~ |   | ▀ | ▀ |   |
| 1                                                           | 1              | 1              | 0              | E                                            |   |   | .  | > | N | ↑ | / | π |   | ▀ | ▀ | / | π | ▀ | ▀ |   |
| 1                                                           | 1              | 1              | 1              | F                                            |   |   | /  | ? | O | + | ▀ | ▀ |   | - | ▀ | ▀ | ▀ | ▀ | π |   |

Fig. 10-11 SWEDEN (Upper case/Graphics mode, Secondary address = 0)



# ASCII CODE TABLE

|                |                |                |                |                |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----------------|----------------|----------------|----------------|----------------|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
|                |                |                |                | b <sub>7</sub> | 0 | 0 | 0  | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
|                |                |                |                | b <sub>6</sub> | 0 | 0 | 0  | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
|                |                |                |                | b <sub>5</sub> | 0 | 0 | 1  | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
|                |                |                |                | b <sub>4</sub> | 0 | 1 | 0  | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
|                |                |                |                |                | Ø | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
| b <sub>4</sub> | b <sub>3</sub> | b <sub>2</sub> | b <sub>1</sub> | Ø              |   |   |    | Ø | à | P | ` | 7 |   |   | è | ` | 7 | è |   |   |
| 0              | 0              | 0              | 0              | 1              |   |   | !  | 1 | A | Q | ◄ | ◄ |   |   | l | à | ◄ | ◄ | l | à |
| 0              | 0              | 0              | 1              | 2              |   |   | "  | 2 | B | R | ▬ | / |   |   | l | è | ▬ | / | l | è |
| 0              | 0              | 1              | 1              | 3              |   |   | #  | 3 | C | S | ■ | ■ |   |   | ± | ì | ■ | ■ | ± | ì |
| 0              | 1              | 0              | 0              | 4              |   |   | \$ | 4 | D | T | ■ | ◊ |   |   | ∟ | ò | ■ | ◊ | ∟ | ò |
| 0              | 1              | 0              | 1              | 5              |   |   | %  | 5 | E | U | ■ |   |   |   | † | ù | ■ |   | † | ù |
| 0              | 1              | 1              | 0              | 6              |   |   | &  | 6 | F | V | ` | ▬ |   |   | - | â | ` | ▬ | - | â |
| 0              | 1              | 1              | 1              | 7              |   |   | '  | 7 | G | W | / | ■ |   |   | † | é | / | ■ | † | é |
| 1              | 0              | 0              | 0              | 8              |   |   | (  | 8 | H | X |   | ▬ |   |   | r | î |   | ▬ | r | î |
| 1              | 0              | 0              | 1              | 9              |   |   | )  | 9 | I | Y |   | ▬ |   |   | τ | ò |   | ▬ | τ | ò |
| 1              | 0              | 1              | 0              | A              |   |   | *  | : | J | Z |   |   |   |   | ∟ | û |   |   | ∟ | û |
| 1              | 0              | 1              | 1              | B              |   |   | +  | ; | K | [ | \ | è |   |   | + | Ä | \ | è | + | Ä |
| 1              | 1              | 0              | 0              | C              |   |   | ,  | < | L | \ | L | ï |   |   | £ | ö | L | ï | £ | ö |
| 1              | 1              | 0              | 1              | D              |   |   | -  | = | M | ] | / | 2 |   |   | ' | Û | / | 2 | ' | Û |
| 1              | 1              | 1              | 0              | E              |   |   | .  | > | N | ↑ | - | π |   |   | ^ | β | - | π | ^ | β |
| 1              | 1              | 1              | 1              | F              |   |   | /  | ? | O | ▬ | Γ | ç |   |   | " | é | Γ | ç | " | π |

Fig. 10-13 SWITZERLAND (Upper case/Graphics mode, Secondary address = 0)

ascii code table

|                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| b <sub>7</sub> | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| b <sub>7</sub> | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| b <sub>6</sub> | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| b <sub>5</sub> | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |

|                |                |                |                |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----------------|----------------|----------------|----------------|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| b <sub>4</sub> | b <sub>2</sub> | b <sub>3</sub> | b <sub>4</sub> | Ø | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | a | b | c | d | e | f |
| 0              | 0              | 0              | 0              | Ø |   |    |   | Ø | à | p | ` | P |   |   | g | ` | P |   | g |
| 0              | 0              | 0              | 1              | 1 |   | !  | 1 | a | q | A | Q |   |   | l | à | A | Q | l | à |
| 0              | 0              | 1              | 0              | 2 |   | "  | 2 | b | r | B | R |   |   | l | è | B | R | l | è |
| 0              | 0              | 1              | 1              | 3 |   | #  | 3 | c | s | C | S |   |   | ± | i | C | S | ± | i |
| 0              | 1              | 0              | 0              | 4 |   | \$ | 4 | d | t | D | T |   |   | ¸ | ò | D | T | ¸ | ò |
| 0              | 1              | 0              | 1              | 5 |   | %  | 5 | e | u | E | U |   |   | † | ù | E | U | † | ù |
| 0              | 1              | 1              | 0              | 6 |   | &  | 6 | f | v | F | V |   |   | - | â | F | V | - | â |
| 0              | 1              | 1              | 1              | 7 |   | '  | 7 | g | w | G | W |   |   | † | ê | G | W | † | ê |
| 1              | 0              | 0              | 0              | 8 |   | (  | 8 | h | x | H | X |   |   | r | î | H | X | r | î |
| 1              | 0              | 0              | 1              | 9 |   | )  | 9 | i | y | I | Y |   |   | τ | ò | I | Y | τ | ò |
| 1              | 0              | 1              | 0              | a |   | *  | : | j | z | J | Z |   |   | γ | ù | J | Z | γ | ù |
| 1              | 0              | 1              | 1              | b |   | +  | ; | k | [ | K | ë |   |   | + | ä | K | ë | + | ä |
| 1              | 1              | 0              | 0              | c |   | ,  | < | l | \ | L | ï |   |   | £ | ö | L | ï | £ | ö |
| 1              | 1              | 0              | 1              | d |   | -  | = | m | ] | M | ² |   |   | ' | ü | M | ² | ' | ü |
| 1              | 1              | 1              | 0              | e |   | .  | > | n | ↑ | N | π |   |   | ˆ | β | N | π | ˆ | β |
| 1              | 1              | 1              | 1              | f |   | /  | ? | o | - | O | ç |   |   | " | é | O | ç | " | π |

Fig. 10-14 SWITZERLAND (Upper/Lower case mode, Secondary address = 7)

# ASCII CODE TABLE

|                |                |                |                | b <sub>2</sub> | 0 | 0 | 0  | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |   |
|----------------|----------------|----------------|----------------|----------------|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
|                |                |                |                | b <sub>7</sub> | 0 | 0 | 0  | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
|                |                |                |                | b <sub>4</sub> | 0 | 0 | 1  | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
|                |                |                |                | b <sub>3</sub> | 0 | 1 | 0  | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
|                |                |                |                |                | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
| b <sub>4</sub> | b <sub>2</sub> | b <sub>3</sub> | b <sub>4</sub> | 0              |   |   |    | 0 | @ | P | - | 7 |   |   | r | - | 7 |   | r |   |
| 0              | 0              | 0              | 1              | 1              |   |   | !  | 1 | A | Q | ♠ | ● |   | ▮ | ± | ♠ | ● | ▮ | ± |   |
| 0              | 0              | 1              | 1              | 2              |   |   | "  | 2 | B | R |   | - |   | ▮ | ± |   | - | ▮ | ± |   |
| 0              | 1              | 0              | 1              | 3              |   |   | #  | 3 | C | S | - | ♥ |   | - | ± | - | ♥ | - | ± |   |
| 0              | 1              | 0              | 0              | 4              |   |   | \$ | 4 | D | T | - |   |   | - |   | - |   | - |   |   |
| 0              | 1              | 0              | 1              | 5              |   |   | %  | 5 | E | U | - | / |   |   |   | - | / |   |   |   |
| 0              | 1              | 1              | 0              | 6              |   |   | &  | 6 | F | V | - | x |   | ▮ | ▮ | - | x | ▮ | ▮ |   |
| 0              | 1              | 1              | 1              | 7              |   |   | '  | 7 | G | W |   | o |   |   | - |   | o |   | - |   |
| 1              | 0              | 0              | 0              | 8              |   |   | (  | 8 | H | X |   | ♣ |   | ▮ | - |   | ♣ | ▮ | - |   |
| 1              | 0              | 0              | 1              | 9              |   |   | )  | 9 | I | Y | ~ |   |   | ▮ | ▮ | ~ |   | ▮ | ▮ |   |
| 1              | 0              | 1              | 0              | A              |   |   | *  | : | J | Z | ' | ♦ |   |   | ▮ | ' | ♦ |   | ▮ |   |
| 1              | 0              | 1              | 1              | B              |   |   | +  | ; | K | [ | ' | + |   | ▮ | ▮ | ' | + | ▮ | ▮ |   |
| 1              | 1              | 0              | 0              | C              |   |   | ,  | < | L | £ | L | ⌘ |   | ▮ | ▮ | L | ⌘ | ▮ | ▮ |   |
| 1              | 1              | 0              | 1              | D              |   |   | -  | = | M | ] | \ |   |   | ▮ | ▮ | \ |   | ▮ | ▮ |   |
| 1              | 1              | 1              | 0              | E              |   |   | ,  | > | N | ↑ | / | π |   | ▮ | ▮ | / | π | ▮ | ▮ |   |
| 1              | 1              | 1              | 1              | F              |   |   | /  | ? | O | ← | ▮ | ▮ |   | ▮ | ▮ | ▮ | ▮ | ▮ | ▮ |   |

Fig. 10-15 USA/UK (Upper case/Graphics mode, Secondary address = 0)

ascii code table

|                |                |                |                |                |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----------------|----------------|----------------|----------------|----------------|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
|                |                |                |                | b <sub>7</sub> | 0 | 0 | 0  | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
|                |                |                |                | b <sub>6</sub> | 0 | 0 | 0  | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
|                |                |                |                | b <sub>5</sub> | 0 | 0 | 1  | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
|                |                |                |                | b <sub>4</sub> | 0 | 1 | 0  | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
|                |                |                |                |                | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | a | b | c | d | e | f |
| b <sub>4</sub> | b <sub>3</sub> | b <sub>2</sub> | b <sub>1</sub> | 0              |   |   |    | 0 | @ | p | - | P |   |   | r | - | P |   | r |   |
| 0              | 0              | 0              | 0              | 1              |   |   | !  | 1 | a | q | A | Q |   | ! | ± | A | Q | ! | ± |   |
| 0              | 0              | 0              | 1              | 2              |   |   | "  | 2 | b | r | B | R |   | ■ | τ | B | R | ■ | τ |   |
| 0              | 0              | 1              | 0              | 3              |   |   | #  | 3 | c | s | C | S |   | - | † | C | S | - | † |   |
| 0              | 0              | 1              | 1              | 4              |   |   | \$ | 4 | d | t | D | T |   | _ |   | D | T | _ |   |   |
| 0              | 1              | 0              | 0              | 5              |   |   | %  | 5 | e | u | E | U |   |   |   | E | U |   |   |   |
| 0              | 1              | 0              | 1              | 6              |   |   | &  | 6 | f | v | F | V |   | ⌘ | ! | F | V | ⌘ | ! |   |
| 0              | 1              | 1              | 0              | 7              |   |   | '  | 7 | g | w | G | W |   |   | - | G | W |   | - |   |
| 1              | 0              | 0              | 0              | 8              |   |   | (  | 8 | h | x | H | X |   | ⌘ | - | H | X | ⌘ | - |   |
| 1              | 0              | 0              | 1              | 9              |   |   | )  | 9 | i | y | I | Y |   | ⌘ | - | I | Y | ⌘ | - |   |
| 1              | 0              | 1              | 0              | a              |   |   | *  | : | j | z | J | Z |   |   | ✓ | J | Z |   | ✓ |   |
| 1              | 0              | 1              | 1              | b              |   |   | +  | ; | k | [ | K | + |   | † | ■ | K | + | † | ■ |   |
| 1              | 1              | 0              | 0              | c              |   |   | ,  | < | l | £ | L | ⌘ |   | ■ | ■ | L | ⌘ | ■ | ■ |   |
| 1              | 1              | 0              | 1              | d              |   |   | -  | = | m | ] | M |   |   | └ | ┘ | M |   | └ | ┘ |   |
| 1              | 1              | 1              | 0              | e              |   |   | .  | > | n | ↑ | N | ⌘ |   | └ | ■ | N | ⌘ | └ | ■ |   |
| 1              | 1              | 1              | 1              | f              |   |   | /  | ? | o | ← | O | ⌘ |   | - | ■ | O | ⌘ | - | ■ |   |

Fig. 10-16 USA/UK (Upper/Lower case mode, Secondary address = 7)

