

Chapter 6

Extra functions....

Subjects covered in this chapter:

- Incremental print
- Printable code area expansion
- Eighth bit setting
- Control code printing
- Reset, paper out, bell, and delete
- Print head control
- Character table selection
- International character sets
- Print mode selection
- User defined characters
- Hexadecimal dump

Incremental print

This code allows characters sent to the printer to be printed-out immediately. After printing, the paper is fed forward to allow the character(s) to be seen. The paper returns to the previous print position when it receives the next character.

TOSELECT: ESC i SOH

Example command:

```
LPRINT CHR$(27) + "i" + CHR$(1)
```

TOCANCEL: ESC i NUL

Example command:

```
LPRINT CHR$(27) + "i" + CHR$(0)
```

The following example program will set up the DMP3000 as a 'typewriter' - ie. characters typed in at the keyboard will be printed-out directly. Carriage returns should be used to terminate lines. Note that spaces will only be printed-out when followed by a printable character.

```

10 WHILE NOT escaped
20   a$=INKEY$
30   IF a$="" THEN 20
40   LPRINT CHR$(27) + "i" + CHR$(1);
50   IF a$=CHR$(13) THEN PRINT a$: LPRINT a$
60   PRINT a$;: LPRINT a$;
70   LPRINT CHR$(27) + "i" + CHR$(0);
80 WEND

```

RUN

WARNING: Do not attempt incremental printing within the bottom 80mm of the paper, (or within 30mm of the perforations on tractor feed paper).

Printable code area expansion

In non-IBM mode, ie. when using Epson FX character sets (tables 1 and 2), characters 128 to 159 and 255 (&80 to &9F and &FF hex) are by default non-printing control characters (see appendix 2).

This code overrides the default setting and makes available the following additional characters:

Table 1
Epson FX - standard

128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
à	é	ù	ò	ì	°	£	í	¿	ñ	ñ	ó	Æ	À	á	Ç
&80	&81	&82	&83	&84	&85	&86	&87	&88	&89	&8A	&8B	&8C	&8D	&8E	&8F

144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
Š	ß	Æ	æ	Ø	ø	ˆ	Ä	Ö	Ü	ä	ö	ü	É	é	¥
&90	&91	&92	&93	&94	&95	&96	&97	&98	&99	&9A	&9B	&9C	&9D	&9E	&9F

255
Ø
&FF

Table 2
Epson FX - NLQ

128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
à	é	ù	ò	í	ó	£	ì	ç	¸	ñ	ê				
&80	&81	&82	&83	&84	&85	&86	&87	&88	&89	&8A	&8B	&8C	&8D	&8E	&8F

144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
															
&90	&91	&92	&93	&94	&95	&96	&97	&98	&99	&9A	&9B	&9C	&9D	&9E	&9F

255

&FF

TO SELECT: ESC 6

Example command:

```
LPRINT CHR$(27) + "6"
```

TO CANCEL: ESC 7

Example command:

```
LPRINT CHR$(27) + "7"
```

The above code will not operate under IBM character sets #1 or #2 (tables 3.1, 3.2, 4.1 and 4.2).

Example program:

```
10 LPRINT CHR$(27) + "m" + CHR$(0)
20 LPRINT CHR$(27) + "6"
30 FOR n=128 TO 159
40   LPRINT CHR$(n);
50 NEXT
60 LPRINT CHR$(255)
```

RUN

Set eighth bit

This code sets the eighth bit of every code sent to the printer to 1.

TO SELECT: ESC >

Example command:

```
LPRINT CHR$(27) + ">"
```

Unset eighth bit

This code sets the eighth bit of every code sent to the printer to 0.

TO SELECT: ESC =

Example command:

```
LPRINT CHR$(27) + "="
```

Accept eighth bit

This code cancels the above (set and unset) commands, directing the printer to accept all eight bits as they are received from the computer.

TO SELECT: ESC #

Example command:

```
LPRINT CHR$(27) + "#"
```

Control code printing

By default, control codes are executed when sent to the printer. This code allows instead, the printing-out of any following control codes (between 0 and 31).

Note that not all codes in this range can be set to produce printable characters.

TO SELECT: ESC I SOH

Example command:

```
LPRINT CHR$(27) + "I" + CHR$(1)
```

TO CANCEL: ESC I NUL

Example command:

```
LPRINT CHR$(27) + "I" + CHR$(0)
```

Reset printer

This code resets the printer. The printer will then perform as if it had just been switched on.

TO SELECT: ESC @

Example command:

```
LPRINT CHR$(27) + "@"
```

Paper out sensor disable

This code disables the action of the PAPER OUT sensor which halts the printer when there is no paper.

TO SELECT: ESC 8

Example command:

```
LPRINT CHR$(27) + "8"
```

Paper out sensor enable

This code re-enables the action of the PAPER OUT sensor.

TO SELECT: ESC 9

Example command:

```
LPRINT CHR$(27) + "9"
```

Bell

This code sounds the printer's internal bleeper.

TO SELECT: BEL

Example command:

```
LPRINT CHR$(7)
```

Delete

This code removes the last character from the printer's buffer.

TO SELECT: DEL

Example command:

```
LPRINT CHR$(127)
```

Note that the above code will not operate in the incremental print mode, nor will it delete any *control codes* in the buffer.

Home head

This code moves the print head to the home (leftmost) position.

TO SELECT: ESC <

Example command:

```
LPRINT CHR$(27) + "<"
```

Uni-directional printing

By default, the DMP3000 prints in both directions - left to right and right to left. This code selects printing from left to right only.

TO SELECT: ESC U SOH

Example command:

```
LPRINT CHR$(27) + "U" + CHR$(1)
```

TO CANCEL: ESC U NUL

Example command:

```
LPRINT CHR$(27) + "U" + CHR$(0)
```

NOTE: When printing-out graphics characters or boxes whose vertical lines are to be continuous down the page (or when using ready-made graphics characters from IBM character sets #1 and #2), you should additionally select uni-directional printing. This will afford more accurate alignment of the vertical lines.

Half speed

This code halves the speed of the print head's movement.

TO SELECT: ESC s SOH

Example command:

```
LPRINT CHR$(27) + "s" + CHR$(1)
```

TO CANCEL: ESC s NUL

Example command:

```
LPRINT CHR$(27) + "s" + CHR$(0)
```

Character table selection

The setting of DIP switches DS1-7 and DS1-8 (described in chapter 2) facilitates hardware selection of the default character set to be used when the printer is switched on. The following code allows the DIP switch settings to be overridden by software.

TO SELECT: ESC m <n>

...where <n> is in the range 0 to 2 to select the following character tables (see appendix 2):

<n>	STANDARD TYPEFACE	NLQ TYPEFACE
0	Table 1	Table 2
1	Table 3.1	Table 4.1
2	Table 3.2	Table 4.2

Example command:

```
LPRINT CHR$(27) + "m" + CHR$(1)
```

The following example program uses the above code and selects NLQ typeface in order to print-out characters from table 4.2 (see appendix 2).

```
10 LPRINT CHR$(27) + "m" + CHR$(2)
20 LPRINT CHR$(27) + "x" + CHR$(1)
30 FOR c=3 TO 6
40   LPRINT CHR$(c)
50 NEXT
```

RUN

International character set selection

The setting of DIP switches DS1-1, DS1-2 and DS1-3 (described in chapter 2) facilitates hardware selection of the international characters to be used when the printer is switched on. The following code allows the DIP switch settings to be overridden by software.

TO SELECT: ESC R <n>

...where <n> is in the range 0 to 8 for the following countries:

<u><n></u>	<u>COUNTRY</u>
0	USA
1	France
2	Germany
3	UK
4	Denmark
5	Sweden
6	Italy
7	Spain
8	Japan

Example command:

```
LPRINT CHR$(27) + "R" + CHR$(3)
```

The following example program prints-out (for each of the above countries - 0 to 8) the character numbers listed in line 100.

```
10 LPRINT CHR$(27) + "m" + CHR$(0)
20 FOR n=0 TO 8
30   RESTORE 100
40   LPRINT CHR$(27) + "R" + CHR$(n)
50   FOR c=1 TO 12
60     READ d
70     LPRINT " "; CHR$(d);
80   NEXT
90 NEXT
100 DATA 35,36,64,91,92,93,94,96,123,124,125,126

RUN
```

IMPORTANT: To print international characters, IBM character set #1 or #2 must NOT be selected - ie. DIP switch DS1-8 must be *off*, or ESC m NUL selected.

Print mode selection

This code enables you to select a combination of some of the more commonly used typefaces and options, namely: standard, mini, condensed, bold, double strike and double width.

TOSELECT: ESC ! <n>

Example command:

```
LPRINT CHR$(27) + "!" + CHR$(17)
```

...where <n> is a bit-significant number selecting the typeface and option as follows:

Standard typeface	- set the value of <n> to 0
Mini typeface	- add 1 to the value of <n>
Condensed typeface	- add 4 to the value of <n>
Bold option	- add 8 to the value of <n>
Double strike option	- add 16 to the value of <n>
Double width option	- add 32 to the value of <n>

Thus, setting the value of <n> to 17 (as in the above example command) selects mini typeface (add 1) with the double strike option (add 16), ie. $1 + 16 = 17$.

Remember that illegal combinations of typeface and option must be avoided when choosing the value of <n>. See the table at the end of chapter 3.

NOTE: Do not set the value of <n> to 9 as the printer will interpret this as a tab (HT) control character.

TO CANCEL: ESC ! NUL

Example command:

```
LPRINT CHR$(27) + "!" + CHR$(0)
```

User defined characters

The printer has the ability to print user defined characters. The following section outlines how to go about defining (downloading) a character.

There are four main stages to go through before a downloaded character appears on the paper:

1. Download character definition
2. Download character set selection
3. Control code printing selection
4. Printing of the character

1. Download character definition

TO SELECT: ESC & NUL <first> <last> <attribute> <d1> <d2>etc.... <d11>
<attribute> <d1> <d2>etc.... <d11>
<attribute> <d1> <d2>etc.... <d11>
<attribute> <d1> <d2>etc.... <d11>
....etc....

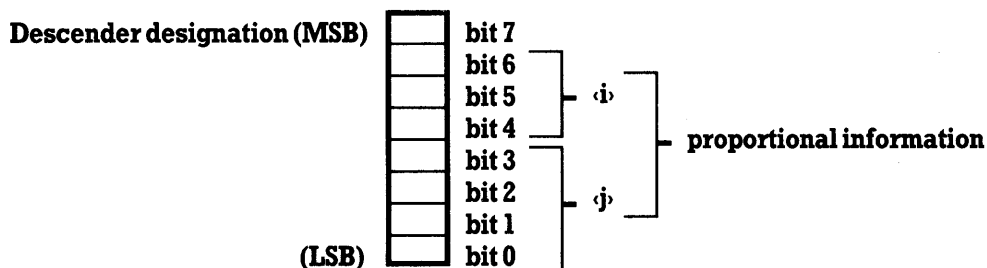
Example command:

```
LPRINT CHR$(27) + "&" + CHR$(0) + CHR$(5) + CHR$(5) + CHR$(11)
```

It is possible to define any of the characters in the range 0 to 31, though some of these cannot be displayed (as the control code takes precedence).

The `<first>` and `<last>` parameters specify the range of character numbers which are to be defined. The parameter `<first>` should be less than (or equal to) `<last>`. If `<first>` is less than `<last>`, then the data for the additional characters (`<attribute>` `<d1>` ... `<d11>`) should be added onto the statement.

The `<attribute>` parameter is a bit significant number corresponding as follows:



...where $\langle i \rangle$ is the starting position (in the range 0 to 7), and $\langle j \rangle$ is the finishing position (in the range $\langle i \rangle + 4$ to 11).

Bit 7 sets the descender designation: 0 to descend, 1 not to descend.

Bits 0 to 6 specify proportional information about the character.

The horizontal position of the character in the 11 column grid must be specified by giving start and finish positions.

Bits 4 to 7 contain the starting position which may be in the range 0 to 7. Bits 0 to 3 contain the finishing position which can be in the range (starting position + 4) to 11.

The minimum character size is 5.

The parameters `<d1>` to `<d11>` are the bit significant data for each vertical line of dots, corresponding as follows:

		<code><d1></code>	<code><d2></code>	<code><d3></code>	<code><d4></code>	<code><d5></code>	<code><d6></code>	<code><d7></code>	<code><d8></code>	<code><d9></code>	<code><d10></code>	<code><d11></code>
(MSB)	bit 7											
	bit 6											
	bit 5											
	bit 4											
	bit 3											
	bit 2											
	bit 1											
(LSB)	bit 0											

The character is defined from left to right with the highest bit printed at the top of the character. Note that the printer is incapable of printing contiguous dots on the same horizontal line, and every other horizontally adjacent bit will be ignored if this is attempted. This will become clearer if you study the example at the end of this section.

2. Download character set selection

TO SELECT: ESC % SOH NUL

Example command:

```
LPRINT CHR$(27) + "%" + CHR$(1) + CHR$(0)
```

The above code selects the download character set for use.

TO CANCEL: ESC % NUL NUL

Example command:

```
LPRINT CHR$(27) + "%" + CHR$(0) + CHR$(0)
```

The above code de-selects the download character set and re-selects the internal character set.

For your reference, the following code copies the internal character set into the download set:

TO SELECT: ESC : NUL NUL NUL

Example command:

```
LPRINT CHR$(27) + ":" + CHR$(0) + CHR$(0) CHR$(0)
```

Note that when the printer is switched on, the download set is undefined.

3. Control code printing selection

As described earlier in this chapter (ESC I SOH).

4. Printing of the character

Simply send the download character to the printer.

Example program:

The following program uses the above sequence of operations to create a user defined character (a square box). The parameters <d1> to <d11> are read from the data at the end of the program. The data items' binary equivalents are included to illustrate the relationship between bits and dots.

(NOTE: If you intend to type in this program, you need not bother including the REM statements.)

```
10 REM download character definition
20 LPRINT CHR$(27) + "&" + CHR$(0) + CHR$(5) + CHR$(5) + CHR$(11);
30 FOR d=1 TO 11
40   READ n
50   LPRINT CHR$(n);
60 NEXT
70 :
80 REM download character set selection
90 LPRINT CHR$(27) + "%" + CHR$(1) + CHR$(0)
100 :
110 REM control code printing selection
120 LPRINT CHR$(27) + "I" + CHR$(1)
130 :
140 REM print-out the finished download character (40 times)
150 FOR p=1 TO 40
160   LPRINT CHR$(5);
170 NEXT
180 LPRINT
190 :
200 REM data for square box character
210 DATA 127 :REM binary 1111111
220 DATA 0 :REM binary 0000000
230 DATA 65 :REM binary 1000001
240 DATA 0 :REM binary 0000000
250 DATA 65 :REM binary 1000001
260 DATA 0 :REM binary 0000000
270 DATA 65 :REM binary 1000001
280 DATA 0 :REM binary 0000000
290 DATA 65 :REM binary 1000001
300 DATA 0 :REM binary 0000000
310 DATA 127 :REM binary 1111111
```

RUN

The program will produce the following results:



NOTE: For this example program to work, DIP switch DS2-4 must be set to the *on* position. (See chapter 7 for a table of all DIP switch functions.)

REMEMBER: Always switch the printer *off* before adjusting the DIP switches.

Hexadecimal dump

The DMP3000 has the ability to automatically print-out, in hexadecimal format, the value of each byte of data it receives. To select this mode, the printer must be switched *on* while the LF and FF buttons are held down together.

To illustrate this facility, load a piece of paper into the printer, switch the printer *off*, then hold down the LF and FF buttons together while switching the printer *on* again. The printer is now in the hex dump mode.

Start up BASIC on your PC and type:

```
10 REM abcdef
```

Now list this one-line program to the printer by typing:

```
LLIST
```

You should see the following hex codes printed out:
(If nothing is printed-out, set the printer off line.)

```
31 30 20 52 45 4D 20 61 62 63 64 65 66 0D 0A
```

...which are the ASCII codes (in hex) for the characters in the program you listed (including the line number and spaces) plus carriage return and line feed (0D and 0A).

In the hex dump mode, there will usually be some characters left in the buffer after printing. Therefore, when the printer has stopped, always set it off line to flush the buffer.

To cancel the hex dump mode, simply switch the printer *off*.

Chapter 7

For your reference....

Subjects covered in this chapter:

- Technical Specification
- Printer socket
- Interface
- DIP switch functions
- Signal timing

Technical Specification

Print system:

Impact dot-matrix

Print speed:

160 CPS (standard) 40 CPS (NLQ) - DMP3160

105 CPS (standard) 26 CPS (NLQ) - DMP3000

Printing characteristics (vertical x horizontal):

9 x 9 (normal character)

9 x 10 (double width character)

8 x chosen amount (bit-image)

9 x chosen amount (9 pin bit-image)

96 characters ASCII + italics + international character sets

Normal character size: 2.1 (width) x 2.55 (height) mm

Print sizes:

Standard (Pica) - 10 CPI / 80 CPL

Mini (Elite) - 12 CPI / 96 CPL

Condensed - 17 CPI / 137 CPL

Double width standard - 5 CPI / 40 CPL

Double width mini - 6 CPI / 48 CPL

Double width condensed - 8.5 CPI / 68 CPL

Number of columns:

80 (standard)

40 (double width)

132 (condensed)

66 (double width condensed)

Line feed rates:

1/6 inch
1/8 inch
7/72 inch
<n>/216 inch programmable
<n>/72 inch programmable

Line feed speed:

160 mS (1/6 inch) - DMP3160
200 mS (1/6 inch) - DMP3000

Paper type:

4.5 to 10 inches fan-fold (tractor feed)
4 to 9.5 inches cut sheet or roll paper (friction feed)

Number of copies:

2 sheets (incl. original)
40 g/m² pressure-sensitive paper train

Interface:

Parallel (Centronics compatible)

Mains supply:

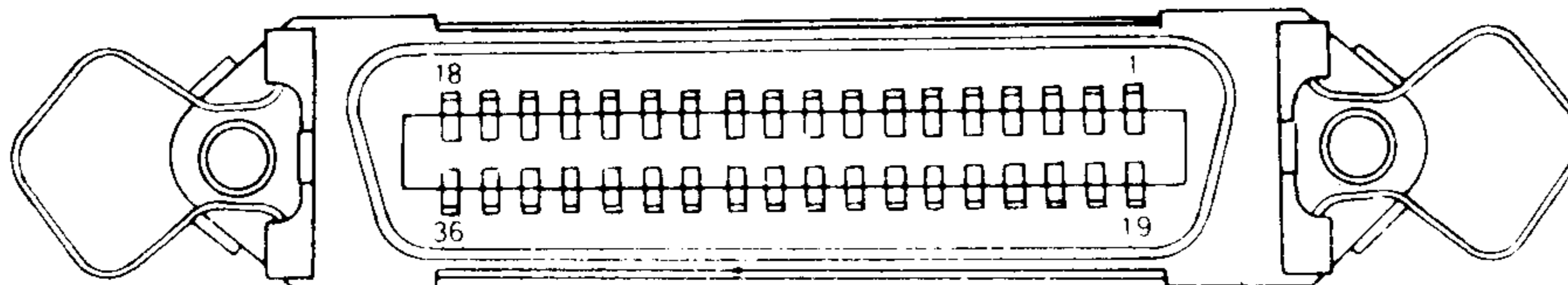
220-240 Volt AC 50 Hz

Dimensions:

16 (width) x 10 (depth) x 4 (height) inches
(400 x 250 x 100 mm)

Weight:

4.2 kg

Printer socket

Rear view of printer

Interface

PIN	DESIGNATION	I/O	DESCRIPTION
1	$\overline{\text{STROBE}}$	IN	Taking pin low enables receiving of DATA 0 to DATA 7. Minimum necessary pulse width is 0.5 μ S.
2	DATA 0 (LSB)	IN	8-bit data signal. Taking pin high or low corresponds to 1 and 0 respectively.
3	DATA 1		
4	DATA 2		
5	DATA 3		
6	DATA 4		
7	DATA 5		
8	DATA 6		
9	DATA 7 (MSB)		
10	$\overline{\text{ACKNOWLEDGE}}$	OUT	Active low output pulse generated when data entry and processing are completed. After this signal, subsequent data will be accepted. This signal is also generated when changing from off line to on line.
11	BUSY	OUT	Output high under any of the following conditions: a. Going off line. b. Paper feed or printing operation. c. When a control code is received.
12	PE	OUT	Output high when paper is out. (When on line, paper out is sensed after executing the paper feed command. When off line, paper out is always sensed.)
13	SELECT	OUT	On line and off line correspond to high and low respectively. When off line, DATA 0 to DATA 7 cannot be received.
14	$\overline{\text{AFD}}$	IN	Taking pin low generates line feed.
15	NC		
16	OV		
17	CHASSIS GND		
18	+5V	OUT	+5V (50mA max) power supply output.
19	GND		Signal ground.
20	GND		Signal ground.
21	GND		Signal ground.
22	GND		Signal ground.
23	GND		Signal ground.
24	GND		Signal ground.
25	GND		Signal ground.

PIN	DESIGNATION	I/O	DESCRIPTION
26	GND		Signal ground.
27	GND		Signal ground.
28	GND		Signal ground.
29	GND		Signal ground.
30	GND		Signal ground.
31	<u>INPUT PRIME</u>	IN	Taking pin low initialises printer. Minimum necessary pulse width is 100 μ S.
32	<u>FAULT</u>	OUT	Output low when off line.
33	GND		
34	NC		
35	+5V	OUT	
36	<u>SLCT IN</u>	IN	Taking pin low or high sets printer on line or off line respectively (when the printer is not in error condition).

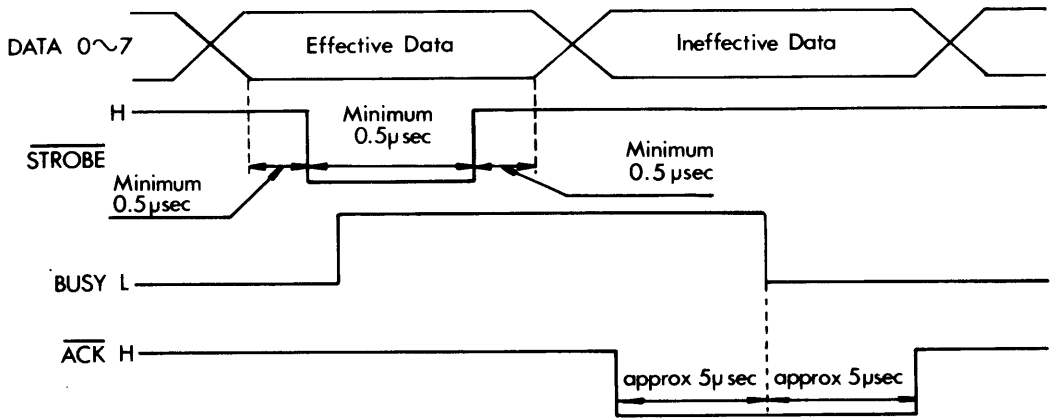
DIP switch functions

Chapter 2 described how to adjust DIP switches DS1-7, DS1-8 to select the default character set, and also how to adjust DS1-1, DS1-2, DS1-3 to select the required international characters. The following table indicates the functions of the remaining DIP switches:

SWITCH	FUNCTION	OFF	ON
DS1-1	International characters	See chapter 2	See chapter 2
DS1-2		See chapter 2	See chapter 2
DS1-3		See chapter 2	See chapter 2
DS1-4	CR function	CR only	CR & LF
DS1-5	Paper out sensor	Enable	Disable
DS1-6	Page length	11 inch	12 inch
DS1-7	Default character set	See chapter 2	See chapter 2
DS1-8		See chapter 2	See chapter 2
DS2-1	Zero character	Unslashed	Slashed
DS2-2	Default skip perforation	Disable	Enable
DS2-3	Buffer mode	Character	Graphics
DS2-4		Character/graphics	Download
DS2-5	SLCT IN signal	Not sent	Automatically sent
DS2-6	Alarm bleeper	Disable	Enable
DS2-7	Default typeface	Bold off	Condensed & bold on
DS2-8		Condensed off	Bold on
DS2-9	Do not use (factory-set)		
DS2-10	Do not use (factory-set)		

REMEMBER: Always switch the printer *off* before adjusting the DIP switches.

Signal timing



DATA input waveform

Appendix 1

Table of control codes

CODE	DECIMAL	HEX	FUNCTION
BEL	7	&07	Sound bleeper
BS	8	&08	Back space
HT	9	&09	Horizontal tab jump
LF	10	&0A	Line feed
VT	11	&0B	Vertical tab jump
FF	12	&0C	Form feed
CR	13	&0D	Carriage return
SO	14	&0E	Select double width
SI	15	&0F	Select condensed
DC1	17	&11	Device control 1
DC2	18	&12	Cancel condensed
DC3	19	&13	Device control 3
DC4	20	&14	Cancel double width
CAN	24	&18	Clear buffer
DEL	127	&7F	Delete last character from buffer
ESC SO	27 14	&1B &0E	Select double width
ESC SI	27 15	&1B &0F	Select condensed
ESC ! (parameter)	27 33 (n)	&1B &21 (n)	Select print mode
ESC #	27 35	&1B &23	Accept eighth bit
ESC % (parameters)	27 37 (n)..	&1B &25 (n)..	Select internal or download character set

CODE	DECIMAL	HEX	FUNCTION
ESC & NUL ⟨parameters⟩	27 38 0 ⟨n⟩..	&1B &26 &00 ⟨n⟩..	Define download character
ESC * ⟨parameters⟩	27 42 ⟨n⟩..	&1B &2A ⟨n⟩..	Select bit image graphics
ESC - ⟨parameter⟩	27 45 ⟨n⟩	&1B &2D ⟨n⟩	Select or cancel underline
ESC / ⟨parameter⟩	27 47 ⟨n⟩	&1B &2F ⟨n⟩	Select tab channel
ESC Ø	27 48	&1B &30	Select 1/8 inch paper feed
ESC 1	27 49	&1B &31	Select 7/72 inch paper feed
ESC 2	27 50	&1B &32	Select 1/6 inch paper feed
ESC 3 ⟨parameter⟩	27 51 ⟨n⟩	&1B &33 ⟨n⟩	Select variable ⟨n⟩/216 inch paper feed
ESC 4	27 52	&1B &34	Select italics
ESC 5	27 53	&1B &35	Cancel italics
ESC 6	27 54	&1B &36	Select printable code area expansion
ESC 7	27 55	&1B &37	Cancel printable code area expansion
ESC 8	27 56	&1B &38	Disable paper out detection
ESC 9	27 57	&1B &39	Enable paper out detection
ESC : NUL ⟨parameters⟩	27 58 0 ⟨n⟩..	&1B &3A &00 ⟨n⟩..	Copy internal character set into download set
ESC <	27 60	&1B &3C	Home head

CODE	DECIMAL	HEX	FUNCTION
ESC =	27 61	&1B &3D	Unset eighth bit to 0
ESC >	27 62	&1B &3E	Set eighth bit to 1
ESC ? <parameters>	27 63 <n>..	&1B &3F <n>..	Select/change bit image mode
ESC @	27 64	&1B &40	Reset printer
ESC A <parameter>	27 65 <n>	&1B &41 <n>	Select variable <n>/72 inch paper feed
ESC B <parameters> NUL	27 66 <n>..0	&1B &42 <n>.. &00	Set vertical tabs
ESC C <parameters>	27 67 <n>..	&1B &43 <n>..	Set page length (by lines or inches)
ESC D <parameters> NUL	27 68 <n>..0	&1B &44 <n>.. &00	Set horizontal tabs
ESC E	27 69	&1B &45	Select bold
ESC F	27 70	&1B &46	Cancel bold
ESC G	27 71	&1B &47	Select double strike
ESC H	27 72	&1B &48	Cancel double strike
ESC I <parameter>	27 73 <n>	&1B &49 <n>	Select or cancel control code printing
ESC J <parameter>	27 74 <n>	&1B &4A <n>	Select variable <n>/216 inch one-shot forward feed
ESC K <parameters>	27 75 <n>..	&1B &4B <n>..	Select single density graphics
ESC L <parameters>	27 76 <n>..	&1B &4C <n>..	Select double density graphics
ESC M	27 77	&1B &4D	Select mini
ESC N <parameters>	27 78 <n>..	&1B &4E <n>..	Select skip perforation

CODE	DECIMAL	HEX	FUNCTION
ESC O	27 79	&1B &4F	Cancel skip perforation
ESC P	27 80	&1B &50	Cancel mini
ESC Q ⟨parameter⟩	27 81 ⟨n⟩	&1B &51 ⟨n⟩	Set right margin
ESC R ⟨parameter⟩	27 82 ⟨n⟩	&1B &52 ⟨n⟩	Select international character set
ESC S ⟨parameter⟩	27 83 ⟨n⟩	&1B &53 ⟨n⟩	Select subscript or superscript
ESC T	27 84	&1B &54	Cancel subscript and superscript
ESC U ⟨parameter⟩	27 85 ⟨n⟩	&1B &55 ⟨n⟩	Select or cancel uni-directional printing
ESC W ⟨parameter⟩	27 87 ⟨n⟩	&1B &57 ⟨n⟩	Select or cancel double-width
ESC Y ⟨parameters⟩	27 89 ⟨n⟩..	&1B &59 ⟨n⟩..	Select double speed double density graphics
ESC Z ⟨parameters⟩	27 90 ⟨n⟩..	&1B &5A ⟨n⟩..	Select quadruple density graphics
ESC ↑ ⟨parameters⟩	27 94 ⟨n⟩..	&1B &5E ⟨n⟩..	Select 9-pin bit image mode
ESC b ⟨parameters⟩ NUL	27 98 ⟨n⟩.. 0	&1B &62 ⟨n⟩.. &00	Set tabs in tab channel
ESC i ⟨parameter⟩	27 105 ⟨n⟩	&1B &69 ⟨n⟩	Select or cancel incremental print
ESC j ⟨parameter⟩	27 106 ⟨n⟩	&1B &6A ⟨n⟩	Select variable ⟨n⟩/216 inch one-shot reverse feed
ESC l ⟨parameter⟩	27 108 ⟨n⟩	&1B &6C ⟨n⟩	Set left margin
ESC m ⟨parameter⟩	27 109 ⟨n⟩	&1B &6D ⟨n⟩	Select character table

CODE	DECIMAL	HEX	FUNCTION
ESC p <parameter>	27 112 <n>	&1B &70 <n>	Select or cancel proportional
ESC s <parameter>	27 115 <n>	&1B &73 <n>	Select or cancel half speed printing
ESC x <parameter>	27 120 <n>	&1B &78 <n>	Select or cancel NLQ

Appendix 2

Character tables

The following character tables may be selected using DIP switches DS1-7 and DS1-8 (see chapter 2 under the section entitled 'Default character set'), or alternatively, by the control code ESC M <n> (see chapter 6 under the section entitled 'Character table selection').

Table 1 (DS1-7 off, DS1-8 off)
Epson FX - standard

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
&00	&01	&02	&03	&04	&05	&06	&07	&08	&09	&0A	&0B	&0C	&0D	&0E	&0F	&10	&11	&12	&13

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
													!	"	#	\$	%	&	'
&14	&15	&16	&17	&18	&19	&1A	&1B	&1C	&1D	&1E	&1F	&20	&21	&22	&23	&24	&25	&26	&27

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
<	>	*	+	,	-	.	/	0	1	2	3	4	5	6	7	8	9	=	;
&28	&29	&2A	&2B	&2C	&2D	&2E	&2F	&30	&31	&32	&33	&34	&35	&36	&37	&38	&39	&3A	&3B

60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
<	=	>	?	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
&3C	&3D	&3E	&3F	&40	&41	&42	&43	&44	&45	&46	&47	&48	&49	&4A	&4B	&4C	&4D	&4E	&4F

80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
P	Q	R	S	T	U	V	W	X	Y	Z	[	\	\]	^	_	`	a	b	c
&50	&51	&52	&53	&54	&55	&56	&57	&58	&59	&5A	&5B	&5C	&5D	&5E	&5F	&60	&61	&62	&63

100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119
d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w
&64	&65	&66	&67	&68	&69	&6A	&6B	&6C	&6D	&6E	&6F	&70	&71	&72	&73	&74	&75	&76	&77

....continued

Table 1 continued....

120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139
x	y	z	{	:	}	~													
&78	&79	&7A	&7B	&7C	&7D	&7E	&7F	&80	&81	&82	&83	&84	&85	&86	&87	&88	&89	&8A	&8B

140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
&8C	&8D	&8E	&8F	&90	&91	&92	&93	&94	&95	&96	&97	&98	&99	&9A	&9B	&9C	&9D	&9E	&9F

160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179
	/	"	#	\$	%	&	'	(	)	*	+	,	-	.	/	0	1	2	3
&A0	&A1	&A2	&A3	&A4	&A5	&A6	&A7	&A8	&A9	&AA	&AB	&AC	&AD	&AE	&AF	&B0	&B1	&B2	&B3

180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199
4	5	6	7	8	9	=	;	<	=	>	?	@	A	B	C	D	E	F	G
&B4	&B5	&B6	&B7	&B8	&B9	&BA	&BB	&BC	&BD	&BE	&BF	&C0	&C1	&C2	&C3	&C4	&C5	&C6	&C7

200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219
H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	[
&CB	&C9	&CA	&CB	&CC	&CD	&CE	&CF	&D0	&D1	&D2	&D3	&D4	&D5	&D6	&D7	&D8	&D9	&DA	&DB

220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
\	J	^	_	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
&DC	&DD	&DE	&DF	&E0	&E1	&E2	&E3	&E4	&E5	&E6	&E7	&E8	&E9	&EA	&EB	&EC	&ED	&EE	&EF

240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255
p	q	r	s	t	u	v	w	x	y	z	{	/	}	~	
&F0	&F1	&F2	&F3	&F4	&F5	&F6	&F7	&F8	&F9	&FA	&FB	&FC	&FD	&FE	&FF

**Table 2 (DS1-7 on, DS1-8 off)
Epson FX - NLQ**

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
&00	&01	&02	&03	&04	&05	&06	&07	&08	&09	&0A	&0B	&0C	&0D	&0E	&0F	&10	&11	&12	&13

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
													!	"	#	\$	%	&	'
&14	&15	&16	&17	&18	&19	&1A	&1B	&1C	&1D	&1E	&1F	&20	&21	&22	&23	&24	&25	&26	&27

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
(	)	*	+	,	-	.	/	0	1	2	3	4	5	6	7	8	9	:	;
&28	&29	&2A	&2B	&2C	&2D	&2E	&2F	&30	&31	&32	&33	&34	&35	&36	&37	&38	&39	&3A	&3B

60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
<	=	>	?	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
&3C	&3D	&3E	&3F	&40	&41	&42	&43	&44	&45	&46	&47	&48	&49	&4A	&4B	&4C	&4D	&4E	&4F

80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
P	Q	R	S	T	U	V	W	X	Y	Z	[	\	\]	^	_	`	a	b	c
&50	&51	&52	&53	&54	&55	&56	&57	&58	&59	&5A	&5B	&5C	&5D	&5E	&5F	&60	&61	&62	&63

100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119
d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w
&64	&65	&66	&67	&68	&69	&6A	&6B	&6C	&6D	&6E	&6F	&70	&71	&72	&73	&74	&75	&76	&77

....continued

Table 2 continued....

120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139
x	y	z	{	:	}	~													
&78	&79	&7A	&7B	&7C	&7D	&7E	&7F	&80	&81	&82	&83	&84	&85	&86	&87	&88	&89	&8A	&8B

140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
&8C	&8D	&8E	&8F	&90	&91	&92	&93	&94	&95	&96	&97	&98	&99	&9A	&9B	&9C	&9D	&9E	&9F

160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179
	/	"	#	\$	%	&	'	(	)	*	+	,	-	.	/	0	1	2	3
&A0	&A1	&A2	&A3	&A4	&A5	&A6	&A7	&A8	&A9	&AA	&AB	&AC	&AD	&AE	&AF	&B0	&B1	&B2	&B3

180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199
4	5	6	7	8	9	:	;	<	=	>	?	@	A	B	C	D	E	F	G
&B4	&B5	&B6	&B7	&B8	&B9	&BA	&BB	&BC	&BD	&BE	&BF	&C0	&C1	&C2	&C3	&C4	&C5	&C6	&C7

200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219
H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	[
&C8	&C9	&CA	&CB	&CC	&CD	&CE	&CF	&D0	&D1	&D2	&D3	&D4	&D5	&D6	&D7	&D8	&D9	&DA	&DB

220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
\	\]	^	_	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
&DC	&DD	&DE	&DF	&EO	&E1	&E2	&E3	&E4	&E5	&E6	&E7	&E8	&E9	&EA	&EB	&EC	&ED	&EE	&EF

240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255
p	q	r	s	t	u	v	w	x	y	z	{	:	}	~	
&FO	&F1	&F2	&F3	&F4	&F5	&F6	&F7	&F8	&F9	&FA	&FB	&FC	&FD	&FE	&FF

**Table 3.1 (DS1-7 off, DS1-8 on)
IBM character set #1 - standard**

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
&00	&01	&02	&03	&04	&05	&06	&07	&08	&09	&0A	&0B	&0C	&0D	&0E	&0F	&10	&11	&12	&13

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
													!	"	#	\$	%	&	'
&14	&15	&16	&17	&18	&19	&1A	&1B	&1C	&1D	&1E	&1F	&20	&21	&22	&23	&24	&25	&26	&27

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
<	>	*	+	,	-	.	/	0	1	2	3	4	5	6	7	8	9	=	;
&28	&29	&2A	&2B	&2C	&2D	&2E	&2F	&30	&31	&32	&33	&34	&35	&36	&37	&38	&39	&3A	&3B

60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
<	=	>	?	Ⓜ	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
&3C	&3D	&3E	&3F	&40	&41	&42	&43	&44	&45	&46	&47	&48	&49	&4A	&4B	&4C	&4D	&4E	&4F

80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
P	Q	R	S	T	U	V	W	X	Y	Z	[	\	\]	^	_	`	a	b	c
&50	&51	&52	&53	&54	&55	&56	&57	&58	&59	&5A	&5B	&5C	&5D	&5E	&5F	&60	&61	&62	&63

100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119
d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w
&64	&65	&66	&67	&68	&69	&6A	&6B	&6C	&6D	&6E	&6F	&70	&71	&72	&73	&74	&75	&76	&77

....continued

Table 3.1 continued....

120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139
×	✓	z	€	:	›	~													
&78	&79	&7A	&7B	&7C	&7D	&7E	&7F	&80	&81	&82	&83	&84	&85	&86	&87	&88	&89	&8A	&8B

140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
&8C	&8D	&8E	&8F	&90	&91	&92	&93	&94	&95	&96	&97	&98	&99	&9A	&9B	&9C	&9D	&9E	&9F

160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179
á	í	ó	ú	ñ	ñ	ä	ö	¿	¡	½	¼	¡	≪	≫	⋮	⋮	⋮	|	
&A0	&A1	&A2	&A3	&A4	&A5	&A6	&A7	&A8	&A9	&AA	&AB	&AC	&AD	&AE	&AF	&B0	&B1	&B2	&B3

180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199
†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†
&B4	&B5	&B6	&B7	&B8	&B9	&BA	&BB	&BC	&BD	&BE	&BF	&C0	&C1	&C2	&C3	&C4	&C5	&C6	&C7

200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219
⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥	■
&CB	&C9	&CA	&CB	&CC	&CD	&CE	&CF	&D0	&D1	&D2	&D3	&D4	&D5	&D6	&D7	&D8	&D9	&DA	&DB

220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
■	■	■	■	α	β	γ	π	Σ	σ	μ	τ	ϋ	θ	Ω	δ	ω	∅	€	∏
&DC	&DD	&DE	&DF	&E0	&E1	&E2	&E3	&E4	&E5	&E6	&E7	&E8	&E9	&EA	&EB	&EC	&ED	&EE	&EF

240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255
≡	±	≥	≤	∫	∫	÷	≈	°	-	-	√	∞	z	■	
&F0	&F1	&F2	&F3	&F4	&F5	&F6	&F7	&F8	&F9	&FA	&FB	&FC	&FD	&FE	&FF

**Table 3.2 (DS1-7 on, DS1-8 on)
IBM character set #2 - standard**

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
			♥	♦	♣	♠													
&00	&01	&02	&03	&04	&05	&06	&07	&08	&09	&0A	&0B	&0C	&0D	&0E	&0F	&10	&11	&12	&13

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
	Ⓢ												!	"	#	\$	%	&	'
&14	&15	&16	&17	&18	&19	&1A	&1B	&1C	&1D	&1E	&1F	&20	&21	&22	&23	&24	&25	&26	&27

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
<	>	*	+	,	-	.	/	0	1	2	3	4	5	6	7	8	9	=	;
&28	&29	&2A	&2B	&2C	&2D	&2E	&2F	&30	&31	&32	&33	&34	&35	&36	&37	&38	&39	&3A	&3B

60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
<	=	>	?	Ⓜ	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
&3C	&3D	&3E	&3F	&40	&41	&42	&43	&44	&45	&46	&47	&48	&49	&4A	&4B	&4C	&4D	&4E	&4F

80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
P	Q	R	S	T	U	V	W	X	Y	Z	[	\	\]	^	_	`	a	b	c
&50	&51	&52	&53	&54	&55	&56	&57	&58	&59	&5A	&5B	&5C	&5D	&5E	&5F	&60	&61	&62	&63

100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119
d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w
&64	&65	&66	&67	&68	&69	&6A	&6B	&6C	&6D	&6E	&6F	&70	&71	&72	&73	&74	&75	&76	&77

....continued

Table 3.2 continued....

120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139
×	γ	z	ç	ı	ı	~		ç	ü	é	ä	ä	à	à	ç	ë	ë	é	ı
&78	&79	&7A	&7B	&7C	&7D	&7E	&7F	&80	&81	&82	&83	&84	&85	&86	&87	&88	&89	&8A	&8B

140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
ı	ı	Ä	Ä	É	æ	Æ	ö	ö	ö	ü	ü	ı	ö	ü	ç	£	¥	₹	₣
&8C	&8D	&8E	&8F	&90	&91	&92	&93	&94	&95	&96	&97	&98	&99	&9A	&9B	&9C	&9D	&9E	&9F

160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179
á	ı	ó	ú	ñ	ñ	ä	ö	ç	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı
&A0	&A1	&A2	&A3	&A4	&A5	&A6	&A7	&A8	&A9	&AA	&AB	&AC	&AD	&AE	&AF	&B0	&B1	&B2	&B3

180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199
ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı
&B4	&B5	&B6	&B7	&B8	&B9	&BA	&BB	&BC	&BD	&BE	&BF	&C0	&C1	&C2	&C3	&C4	&C5	&C6	&C7

200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219
ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı
&C8	&C9	&CA	&CB	&CC	&CD	&CE	&CF	&D0	&D1	&D2	&D3	&D4	&D5	&D6	&D7	&D8	&D9	&DA	&DB

220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
ı	ı	ı	ı	α	β	γ	π	Σ	σ	μ	τ	ε	θ	Ω	δ	∞	∅	€	π
&DC	&DD	&DE	&DF	&E0	&E1	&E2	&E3	&E4	&E5	&E6	&E7	&E8	&E9	&EA	&EB	&EC	&ED	&EE	&EF

240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255
≡	±	≥	≤	ı	J	÷	≈	°	-	-	ı	n	z	ı	
&F0	&F1	&F2	&F3	&F4	&F5	&F6	&F7	&F8	&F9	&FA	&FB	&FC	&FD	&FE	&FF

NOTE: For tables 4.1 and 4.2 select NLQ typeface and use the same DIP switch settings as for tables 3.1 and 3.2 respectively.

**Table 4.1 (DS1-7 off, DS1-8 on)
IBM character set #1 - NLQ**

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
&00	&01	&02	&03	&04	&05	&06	&07	&08	&09	&0A	&0B	&0C	&0D	&0E	&0F	&10	&11	&12	&13	

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
													!	"	#	\$	%	&	'
&14	&15	&16	&17	&18	&19	&1A	&1B	&1C	&1D	&1E	&1F	&20	&21	&22	&23	&24	&25	&26	&27

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
(	)	*	+	,	-	.	/	0	1	2	3	4	5	6	7	8	9	:	;
&28	&29	&2A	&2B	&2C	&2D	&2E	&2F	&30	&31	&32	&33	&34	&35	&36	&37	&38	&39	&3A	&3B

60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
<	=	>	?	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
&3C	&3D	&3E	&3F	&40	&41	&42	&43	&44	&45	&46	&47	&48	&49	&4A	&4B	&4C	&4D	&4E	&4F

80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
P	Q	R	S	T	U	V	W	X	Y	Z	[	\	\]	^	_	'	a	b	c
&50	&51	&52	&53	&54	&55	&56	&57	&58	&59	&5A	&5B	&5C	&5D	&5E	&5F	&60	&61	&62	&63

100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119
d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w
&64	&65	&66	&67	&68	&69	&6A	&6B	&6C	&6D	&6E	&6F	&70	&71	&72	&73	&74	&75	&76	&77

....continued

Table 4.1 continued....

120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139
x	y	z	{	}	~														
&78	&79	&7A	&7B	&7C	&7D	&7E	&7F	&80	&81	&82	&83	&84	&85	&86	&87	&88	&89	&8A	&8B

140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
&8C	&8D	&8E	&8F	&90	&91	&92	&93	&94	&95	&96	&97	&98	&99	&9A	&9B	&9C	&9D	&9E	&9F

160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179
á	í	ó	ú	ñ	Ñ	æ	ø	¿	¬	¼	½	¾	¿	«	»	≡	≡	≡	|
&A0	&A1	&A2	&A3	&A4	&A5	&A6	&A7	&A8	&A9	&AA	&AB	&AC	&AD	&AE	&AF	&B0	&B1	&B2	&B3

180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199
†	†	†	∩	∩	†		∩	∩	∩	∩	∩	∩	∩	∩	∩	∩	∩	∩	∩
&B4	&B5	&B6	&B7	&B8	&B9	&BA	&BB	&BC	&BD	&BE	&BF	&C0	&C1	&C2	&C3	&C4	&C5	&C6	&C7

200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219
∩	∩	∩	∩	∩	∩	∩	∩	∩	∩	∩	∩	∩	∩	∩	∩	∩	∩	∩	∩
&C8	&C9	&CA	&CB	&CC	&CD	&CE	&CF	&D0	&D1	&D2	&D3	&D4	&D5	&D6	&D7	&D8	&D9	&DA	&DB

220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
■	■	■	■	α	β	γ	π	Σ	σ	μ	τ	ϕ	θ	Ω	δ	∞	∅	€	∏
&DC	&DD	&DE	&DF	&E0	&E1	&E2	&E3	&E4	&E5	&E6	&E7	&E8	&E9	&EA	&EB	&EC	&ED	&EE	&EF

240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255
≡	±	≥	≤	∫	∫	÷	≈	°	-	-	√	n	z	■	
&F0	&F1	&F2	&F3	&F4	&F5	&F6	&F7	&F8	&F9	&FA	&FB	&FC	&FD	&FE	&FF

**Table 4.2 (DS1-7 on, DS1-8 on)
IBM character set #2 - NLQ**

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
			♥	♦	♣	♠													
&00	&01	&02	&03	&04	&05	&06	&07	&08	&09	&0A	&0B	&0C	&0D	&0E	&0F	&10	&11	&12	&13

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
	§												!	"	#	§	%	&	'
&14	&15	&16	&17	&18	&19	&1A	&1B	&1C	&1D	&1E	&1F	&20	&21	&22	&23	&24	&25	&26	&27

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
(	)	*	+	,	-	.	/	0	1	2	3	4	5	6	7	8	9	:	;
&28	&29	&2A	&2B	&2C	&2D	&2E	&2F	&30	&31	&32	&33	&34	&35	&36	&37	&38	&39	&3A	&3B

60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
<	=	>	?	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
&3C	&3D	&3E	&3F	&40	&41	&42	&43	&44	&45	&46	&47	&48	&49	&4A	&4B	&4C	&4D	&4E	&4F

80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
P	Q	R	S	T	U	V	W	X	Y	Z	[	\	\]	^	_	`	a	b	c
&50	&51	&52	&53	&54	&55	&56	&57	&58	&59	&5A	&5B	&5C	&5D	&5E	&5F	&60	&61	&62	&63

100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119
d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w
&64	&65	&66	&67	&68	&69	&6A	&6B	&6C	&6D	&6E	&6F	&70	&71	&72	&73	&74	&75	&76	&77

....continued

Table 4.2 continued...

120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139
x	y	z	{	}	~			ç	ü	é	â	ä	à	á	ç	ê	ë	è	ì
&78	&79	&7A	&7B	&7C	&7D	&7E	&7F	&80	&81	&82	&83	&84	&85	&86	&87	&88	&89	&8A	&8B

140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
î	ï	Ä	Å	É	æ	Æ	Ö	ö	ò	û	ù	ÿ	ÿ	Û	¢	£	¥	₹	ƒ
&8C	&8D	&8E	&8F	&90	&91	&92	&93	&94	&95	&96	&97	&98	&99	&9A	&9B	&9C	&9D	&9E	&9F

160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179
á	í	ó	ú	ñ	Ñ	ä	ö	ç	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı
&A0	&A1	&A2	&A3	&A4	&A5	&A6	&A7	&A8	&A9	&AA	&AB	&AC	&AD	&AE	&AF	&B0	&B1	&B2	&B3

180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199
†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†
&B4	&B5	&B6	&B7	&B8	&B9	&BA	&BB	&BC	&BD	&BE	&BF	&C0	&C1	&C2	&C3	&C4	&C5	&C6	&C7

200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219
†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†
&C8	&C9	&CA	&CB	&CC	&CD	&CE	&CF	&D0	&D1	&D2	&D3	&D4	&D5	&D6	&D7	&D8	&D9	&DA	&DB

220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
■	■	■	■	α	β	γ	π	Σ	σ	μ	τ	ϑ	θ	Ω	δ	∞	∅	€	Π
&DC	&DD	&DE	&DF	&E0	&E1	&E2	&E3	&E4	&E5	&E6	&E7	&E8	&E9	&EA	&EB	&EC	&ED	&EE	&EF

240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255
≡	±	≥	≤	∫	∫	÷	≈	°	-	-	√	n	z	■	
&F0	&F1	&F2	&F3	&F4	&F5	&F6	&F7	&F8	&F9	&FA	&FB	&FC	&FD	&FE	&FF

NOTE: The printing of international characters using the character codes shown in chapter 2 (either by DIP switch DS1-1, DS1-2, DS1-3 selection, or by use of the ESC R <n> control code) is NOT possible while IBM character set #1 or #2 is in use. If, therefore, you wish to print international characters, ensure that DIP switch DS1-8 is off.

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