

Tally

Programmer's Application Manual

MTPL Emulation

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Description of MTPL-Sequences

Introduction

Paper and Text Formatting

Character Spacing

Line Spacing

Character Styling

Print Positioning

Graphics

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Introduction

Regardless of the specific MTPL sequences of your printer, this User's Manual describes the sum of all MTPL sequences and control codes. The only differentiation is made between 9 and 24 needle printers as well as the maximum possible paper width of 8 inches (80 column printer) or 13.6 inches (132 column printer). Please note that the print quality LQ (Letter Quality) is only available in the 24 needle printer.



Please be sure to observe the notes and steps described in the Operator's Manual as well as the specific MTPL sequences implemented in your printer and which of the described sequences are thus not available.

Select the MTPL sequence as described in the Operator's Manual, chapter 2. Apart from the command language MTPL your printer also understands other printer emulation sequences and commands. MTPL and an additional emulation can be active at the same time. For this refer to the chapter 2, "Emulations", Operator's Manual.

The following explanations will help you understand the sequences better:

Every sequence description begins with a header, in which the function and the short form of the sequence are listed without parameters, e.g.:

Set Form Length in Lines	CSI ... t
--------------------------	-----------

With the **CSI** (hex.9B, dec.155) control code the most MTPL sequences are introduced.

*) MTPL: "Tally Printer Language"

CSI means “Control Sequence Introducer” and is described by the code 9B (hex.) or ESC [:

- 7-Bit-environment → hex. 1B, hex. 5B (= ESC [)
- 8-Bit-environment → hex. 9B



| It is sensible to use only ESC [as “Control Sequence Introducer” if MTPL is used associated with any other printer emulation.

The last character (in the following example t) specifies the function of the sequence.

The header is followed by the **Data Structure** in ASCII, hexadecimal und decimal syntax with the necessary parameters, e.g.:

ASCII	CSI	n	"t"	[A] set form lenght in lines
hex.	9B	n	74	
dec.	155	n	116	

For the parameter (here n) it is necessary to differentiate between two types of syntax:

- if the parameter is in pointed parentheses, the decimal value is transferred
- if the parameter is **not** in pointed parentheses, the ASCII value is transferred

Example:

Parameter syntax: <n>, with n=0
to be transmitted: dec.0 (hex.00)

Parameter syntax: n, with n=0
to be transmitted: ASCII "0" (hex.30, dec.48)

Each sequence description or a number of the available parameters is additionally specified with a code level from A to C in square brackets (e.g. “[A]”).

This three code levels are defined as follows:

- [A] This code level is to be used for creating new printer driver versions.
- [B] This is an optional extension of the MTPL standard.
- [C] This function is to be used to ensure compatibility tp previous products. When creating new printer driver versions this code level should not be used anymore.

Character explanation and symbol description

- l** Lower case "l"
- i** Informations
- 9** Sequence only applies for 9 needle printer
- 24** Sequence only applies for 24 needle printer

In the following you will find an example for a MTPL sequence with a Basic programming example:

Set to a form length of 72 lines:

MTPL-Sequence		CSI	n with n=72	t
Transmission	ASCII	CSI	"72"	"t"
	hex.	9B	37 32	74
	dec.	155	55 50	116

```
100 REM Sample for the CSI n t sequence in ASCII,  
110 REM using formulars with 72 lines.  
120 REM Please note, in ASCII-Syntax you can use ASCII values  
130 REM equal or bigger codetable no. 32 only.  
140 LPRINT CHR$(155);"72";"t": REM mixed syntax;  
150 REM set form length up to 72 lines  
160 REM The same sequence written in hexadecimal syntax  
170 LPRINT CHR$(&H9B);CHR$(&H37);CHR$(&H32);CHR$(&H74);  
180 REM set form length up to 12 lines  
190 REM The same sequence written in decimal syntax  
200 LPRINT CHR$(155);CHR$(55);CHR$(50);CHR$(116);  
210 REM set form length up to 72 lines
```

Paper and Text Formatting

Form Length

CSI ... t

Data Structure	ASCII	CSI	n	"t"	[A] set form lenght in lines
	hex.	9B	n	74	
	dec.	155	n	116	

Description PUM turned OFF:

n = 1...132 lines at a line spacing of $\frac{1}{6}$ inch (6 lpi)
= 1...176 lines at a line spacing of $\frac{1}{8}$ inch (8 lpi)

This MTPL-sequence sets the form length to n times the current line feed pitch (in inches). Also the current print position is simultaneously defined as top of form.

The value specified for n must be in the range 1 to 255. This value is multiplied by the current line feed pitch to obtain the form length. For example, if 60 is specified for n and the current line feed is $\frac{1}{6}$ inch, the form length is set to 10 inches. Once set by this sequence, the form length is not affected by changing the line spacing.

PUM turned ON:

The unit for n is either the decipoint or defined by the SSU function (Select Size Unit, see page 8).

n = 0: Reset form lenght to default value.
(print menu setting)

Example

```
10 REM      form length
20 LPRINT CHR$(27);"[4t";
30 FOR F=1 TO 2
40 FOR L=1 TO 3
50 LPRINT "length 4:form";F;" line";L
60 NEXT L:LPRINT CHR$(12);:NEXT F
70 LPRINT
80 LPRINT CHR$(27);"[3t";
90 FOR F=1 TO 3
100 FOR L=1 TO 2
110 LPRINT "length 3:form";F;" line";L
120 NEXT L:LPRINT CHR$(12);:NEXT F
130 END
```

```
Length 4:form 1    Line 1
Length 4:form 1    Line 2
Length 4:form 1    Line 3
```

```
Length 4:form 2    Line 1
Length 4:form 2    Line 2
Length 4:form 2    Line 3
```

```
Length 3:form 1    Line 1
Length 3:form 1    Line 2
```

```
Length 3:form 2    Line 1
Length 3:form 2    Line 2
```

```
Length 3:form 3    Line 1
Length 3:form 3    Line 2
```

Turn ON Positioning Unit Mode (SM) Turn OFF Positioning Unit Mode (RM)

CSI 11 h
CSI 11 l

Data Structure	ASCII	CSI	"1"	"1"	"h"	[A] turn PUM ON
	hex.	9B	31	31	68	
	dec.	155	49	49	104	
	ASCII	CSI	"1"	"1"	"l"	[A] turn PUM OFF
	hex.	9B	31	31	69	
	dec.	155	49	49	105	

Description

PUM = Positioning Unit Mode

This mode decides, whether positioning commands or functions that deal with horizontal or vertical position parameters, have characters and line positions as parameters or some fixed units defined by the SSU control function (**Select Size Unit**, see the following sequence).

If PUM is turned on and no unit is defined, the units shall default to decipoints (1/720 of an inch).

If PUM is turned off, the units shall default to line or character distances.



By default the PUM mode is turned off. If PUM is activated the accuracy cannot exceed the vertical or horizontal resolution of your printer.

Data Structure	ASCII	CSI	n	SP	"I"	[B] select size unit
	hex.		9B	n	SP	49
			155	n	SP	73

Description For n the following parameters are available:

n	hex.	dec.	size unit
0	30	48	Decipoints ($1/720$ inch = 0,0353 mm)
1	31	49	Millimeters
2	32	50	Decipoints (0,0353 mm)
3	33	51	Decididots (0,0376 mm)
4	34	52	Mils ($1/1000$ inch = 0,0254 mm)
5	35	53	Basic Measuring Unit BMU ($1/1200$ inch = 0,02117 mm)
6	36	54	Micrometer (0,001 mm)
7	37	55	Pixels

①

- ① This unit is machine dependent and may be of different size horizontally and vertically. Page printers support typically 200, 300 or 600 dpi, matrix printers e.g. 180 or 360 dpi.

Example:

CSI	720	SP	I
1B 55	37 32 30	20	49

results in one inch



By default the size unit is the decipoint. Other size units may not be available due used printer type.



PUM must be set to ON (see page 7)

Set Top and Bottom Margin

Clear Top and Bottom Margin

CSI ... r
CSI r

Data Structure	ASCII	CSI	n ₁	";"	n ₂	"r"	[A] set top and bottom margin
	hex.	9B	n ₁	3B	n ₂	72	
	dec.	155	n ₁	59	n ₂	114	
	ASCII	CSI	"r"				[A] clear top and bottom margin
	hex.	9B	72				
	dec.	155	114				

Description n₁ specifies the value of the top margin
n₂ specifies the value of the bottom margin

n₁, n₂ = 1...132 lines at a line spacing of 1/6 inch (6 lpi)
= 1...176 lines at a line spacing of 1/8 inch (8 lpi)

Examples:

CSI n₁ r set top margin, set bottom margin to default
CSI ; 0 r clear top and bottom margin
CSI ; n₂ r clear top margin, set bottom margin

Any change of margin settings is only effective from the next page on.

The setting of the top and bottom margins depends on the line spacing which is defined before setting the margins. If line spacing is set after the setting of the top and bottom margins, the margin positions on this page are not influenced.

If the form length is changed, the top margin is set to the first line, the bottom margin is set to the last line (= form length).



If there are any logical problems (for example, the setting of top margin is larger than the page length), the sequence is ignored. If only one margin is changed the other margin is automatically reset to the default value.

The unit depends on PUM and is either character positions or defined by the SSU function (Select Size Unit, see page 8).

Example

```
10 REM      top and bottom margin
20 LPRINT CHR$(27);"[6t";:REM form length
30 LPRINT CHR$(27);"[2;5r":REM set margins
40 FOR F=1 TO 2
50 FOR L=2 TO 5
60 LPRINT "form";F;"  line ";L
70 NEXT L:NEXT F
80 LPRINT
90 LPRINT CHR$(27);"[0;0r";:REM clear margins
100 FOR F=1 TO 2
110 FOR L=1 TO 6
120 LPRINT "form";F;"  line ";L
130 NEXT L:NEXT F
140 END
```

```
form 1  line  2
form 1  line  3
form 1  line  4
form 1  line  5
```

```
form 2  line  2
form 2  line  3
form 2  line  4
form 2  line  5
```

```
form 1  line  1
form 1  line  2
form 1  line  3
form 1  line  4
form 1  line  5
form 1  line  6
form 2  line  1
form 2  line  2
form 2  line  3
form 2  line  4
form 2  line  5
form 2  line  6
```

Set Left and Right Margin Clear Left and Right Margin

CSI ... s
CSI s

Data Structure	ASCII	CSI	n ₁	";"	n ₂	"s"	[A] set left and right margin
	hex.		9B	n ₁	3B	n ₂	73
	dec.		155	n ₁	59	n ₂	115
	ASCII	CSI		"s"			[A] clear left and right margin
	hex.		9B		73		
	dec.		155		115		

Description n₁ specifies the value of the left margin
n₂ specifies the value of the right margin

		Print width 8 inches	Print width 13,6 inches
n ₁ , n ₂	=	1... 80 at 10 cpi	= 1...136 at 10 cpi
	=	1... 96 at 12 cpi	= 1...163 at 12 cpi
	=	1...120 at 15 cpi	= 1...204 at 15 cpi
	=	1...136 at 17.1 cpi	= 1...232 at 17.1 cpi
	=	1...160 at 20 cpi	= 1...272 at 20 cpi

Values for n₁, n₂ are valid for a line length of 8 inches (80 column printer) or 13.6 inches (136 column printer) set in the printer menu.

Example:

CSI n₁ s set left margin, set right margin to default
CSI s clear left and right margin
CSI ; n₂ s clear left margin, set right margin

The setting of the left and right margins depends on the current character density.
Any later setting of the character density will not influence the positions of the left and right margins on this page.

The unit depends on PUM and is either character positions or defined by the SSU function (Select Size Unit, see page 8).



If only one margin is changed, the other margin will be reset to default value.

If there are any logical problems (for example, left margin > right margin), the sequence is ignored.

Example

```
10 REM      left and right margin
20 WIDTH "LPT1:",255
30 LPRINT CHR$(27);"[10;53s";
40 LPRINT "Now the left margin is set to column 10 and the ";
50 LPRINT "right margin is set to column 53."
60 LPRINT CHR$(27);"[5;41s";
70 LPRINT "Now the left margin has been reduced to column 5 ";
80 LPRINT "and the right margin has been set to column 41."
90 END
```

Now the left margin is set to column 10 and
the right margin is set to column 53.

Now the left margin has been reduced
to column 5 and the right margin has
been set to column 41.

Set Line Home (SLH)
Set Line Limit (SLL)

CSI ... SP U
CSI ... SP V

Data Structure	ASCII hex. dec.	CSI 9B 155	n n n	SP 20 32	"U" 55 85	[A] set line home	①
	ASCII hex. dec.	CSI 9B 155	n n n	SP 20 32	"V" 55 85	[A] set line limit	②

Description n = 1...maximal print area

- ①** Default setting: Physical left margin of medium or device.

n specifies the left margin. The first position is 1. The unit depends on PUM (Positioning Unit Mode) and is either characters or defined by SSU (Select Size Unit, see page 8).

Example:

CSI SP U reset to physical left margin
CSI 10 SP U set left margin to position 10

- ②** Default setting: Physical right margin (=1) of medium or device.

n specifies the right margin.

The unit depends on PUM (Positioning Unit Mode) and is either character positions or defined by SSU (Select Size Unit, see page 8).

Example:

CSI SP V reset to physical right margin
CSI 80 SP V set right margin to position 80

Right Justification ON

CSI 8 y

Centering ON

CSI 9 y

Right Justification and Centering OFF

CSI 10 y

Right Justification and Centering OFF

CSI : y

Data Structure	ASCII	CSI	n	"y"	justification
	hex.		9B	n	79
	dec.		155	n	121

Description For n the following characters are available:

n	hex.	dec.	justification	
8	38	56	[A] right justification ON	①
9	39	57	[A] centering ON	②
10	31 30	49 48	[A] right justification and centering OFF	
:	3A	58	[C] right justification and centering OFF	

① Leading blanks will not be corrected. Blanks at line end will be ignored.

② The text is centered between the active margins.

Character Spacing

Spacing Increment (SPI)

CSI ... SP G

Data Structure	ASCII	CSI	n1	";"	n2	SP	"G"	[B] [C] set spacing increment
	hex.		9B	n1	3B	n2	20 47	
	dec.		155I	n1	59	n2	32 71	

Description n₁ specifies the line spacing
 n₂ specifies the character spacing

The unit is expressed in decipoints or other units defined by SSU (Select Size Unit, see page 8).

For this note also the sequence "Set Line Spacing (SLS)" on page 26.

Example:

CSI 120 ; 0 G \triangleq 6 lpi, basic cpi
CSI 90 ; 60 G \triangleq 8 lpi, 12 cpi

The default setting of the spacing increment normally is 10 cpi.



| n = 0: The distance is reset to the values set in the printer menu.

Data Structure	ASCII hex. dec.	CSI n 9B 155	"w" 77 119	[A] set cpi
-----------------------	-----------------------	-----------------------	------------------	-------------

Description For n the following parameters are available:

n	hex.	dec.	horizontal spacing
0	30	48	5 cpi
1	31	49	6 cpi
2	32	50	7,5 cpi
3	33	51	[B] [C] 8,6 cpi
4	34	52	10 cpi
5	35	53	12 cpi
6	36	54	15 cpi
7	37	55	[B] [C] 17,1 cpi
11	31 31	49 49	[B] [C] 20 cpi
12	31 32	49 50	[C] 10* cpi



10* cpi in this sequence means higher horizontal resolution of the printed characters (emphasized printing), but lower print speed.

Various character densities can also be used within one line.

The default value for the character density is the printer menu setting.

Example

```
10 REM      character densities
20 LPRINT CHR$(27);"[4wthis is 10 cpi, "
30 LPRINT CHR$(27);"[12wthis is 10 cpi (high resolution), "
40 LPRINT CHR$(27);"[5wthis is 12 cpi, "
50 LPRINT CHR$(27);"[6wthis is 15 cpi, "
60 LPRINT CHR$(27);"[7wthis is 17.1 cpi, "
70 LPRINT CHR$(27);"[11wthis is 20 cpi, "
80 LPRINT CHR$(27);"[0wthis is 5 cpi, "
90 LPRINT CHR$(27);"[1wthis is 6 cpi, "
100 LPRINT CHR$(27);"[2wthis is 7.5 cpi, "
110 LPRINT CHR$(27);"[3wand 8.6 cpi"
120 END

this is 10 cpi, this is 10 cpi (high resolution),
this is 12 cpi, this is 15 cpi, this is 17.1 cpi, this is 20 cpi,
this is 5 cpi, this is 6 cpi,
this is 7.5 cpi, and 8.6 cpi
```

Horizontal Character Spacing (SHS)

CSI ... SP K

Data Structure	ASCII hex. dec.	CSI 9B n	SP 20 32	"K" 4B 75	[A] set cpi
-----------------------	-----------------------	----------------	----------------	-----------------	-------------

Description For n the following parameters are available:

n	hex.	dec.	character spacing
0	30	48	10 cpi
1	31	49	6 cpi
2	32	50	12 cpi
3	33	51	15 cpi

With this sequence the horizontal character spacing is defined.



The change of the character dimensions is implementation dependent.

Character Spacing (SCS)

CSI ... SP g

Data Structure	ASCII	CSI	n	SP	"g"	[A] set character spacing
	hex.		9B	n	20	67
	dec.		155	n	32	103

Description n specifies the character spacing

The unit is either decipoints or depends on the SSU selection (Select Size Unit, see page 8).



The character size will not be changed.

Data Structure	ASCII hex. dec.	CSI n 9B n 155 n	SP 20 32	" \" 5C 92	[A] set additional character spacing
-----------------------	-----------------------	---------------------------------	----------------	------------------	--------------------------------------

Description n specifies the additional character spacing

The units are either decipoints or defined by SSU (Select Size Unit, see page 8).

This function enlarges the inter character spacing. The function will typically be used with proportional spacing to get effects like "spaced out" or right justification.

With fixed spacing, functions like SCS (Set Character Spacing, see previous page 19) should be used.



The character size will not be changed.

Reduced Character Spacing (SRCS)

CSI ... SP f

Data Structure	ASCII	CSI	n	SP	"f"	[B] set reduced character spacing
	hex.		9B	n	20	66
	dec.		155	n	32	102

Description n specifies the reduced character spacing

The units are either decipoints or defined by SSU (Select Size Unit, see page 8).

This function reduces the inter character spacing. The function will typically be used with proportional spacing to get special effects like e.g. kerning.

With fixed spacing, functions like SCS (Set Character pacing, see page 19) should be used.



The character size will not be changed.

Horizontal Motion Index (HMI)

CSI ... p

Data Structure	ASCII	CSI	n	"p"	[C] set HMI
	hex.		9B	n	70
	dec.		155	n	112

Description n = 0...20

The normal character density is enlarged by n * 1/120 inch. If n is set to zero (default setting), HMI is disabled.

Example

```
10 REM      horizontal motion index
20 LPRINT "this is normal width"
30 LPRINT CHR$(27);"[3p";
40 LPRINT "now 3/120 inch is added to normal width"
50 LPRINT CHR$(27);"[6p";
60 LPRINT "now 6/120 inch is added to normal width"
70 END

this is normal width
now 3/120 inch is added to normal width
now 6/120 inch is added to normal width
```

Data Structure	ASCII	CSI	n	"q"	[C] set horizontal step
	hex.		9B	n	71
	dec.		155	n	113

Description n = 1...255

The space between characters is enlarged by $n * 1/120$ inch at the current print position.

Examples:

CSI q enlarging character space by $n * 1/120$ inch
CSI 10 q inserts a $1/12$ inch space

Example

```
10 REM horizontal step
20 LPRINT "in the word 'hori";
30 LPRINT CHR$(27);"[20q";
40 LPRINT "zontal' there is a step of 20/120 inch"
50 END
```

in the word 'hori zontal' there is a step of 20/120 inch

Line Spacing

Vertical Spacing (SVS)

CSI ... SP L

Data Structure	ASCII hex. dec.	CSI n 9B n 155 n	SP "L" 20 4C 32 76	[A] set vertical spacing (lpi)
-----------------------	-----------------------	------------------------	--------------------------	--------------------------------

Description For n the following parameters are available:

n	hex.	dec.	vertical spacing
0	30	48	6 lpi
1	31	49	4 lpi
2	32	50	3 lpi
3	33	51	12 lpi
4	34	52	8 lpi
9	39	57	2 lpi



Note that changing the line spacing also changes the number of lines per page.
Changing of line spacing does not affect the form length set before hand.

Line Density 6 lpi
Line Density 8 lpi

CSI 3 z
CSI 4 z

Data Structure	ASCII hex. dec.	CSI "3" "z" 9B 33 7A 155 51 122	[C] line density 6 lpi (= line spacing 1/6 inch)
	ASCII hex. dec.	CSI "4" "z" 9B 34 7A 155 52 122	[C] line density 8 lpi (= line spacing 1/8 inch)

Description These sequences set the line spacing to 1/6 inch (6 lpi line density) or 1/8 inch (8 lpi line density).
Note that changing the line spacing also changes the number of lines per page.
Changing of line spacing does not affect the current vertical tab stops or form length.

Example

```
10 REM      line spacing
20 LPRINT CHR$(27);"[4z";
30 LPRINT "these two lines are printed with"
40 LPRINT "a spacing of 1/8 inch"
50 LPRINT
60 LPRINT CHR$(27);"[3z";
70 LPRINT "these two lines are printed with"
80 LPRINT "a spacing of 1/6 inch"
90 END

these two lines are printed with
a spacing of 1/8 inch

these two lines are printed with
a spacing of 1/6 inch
```

Set Line Spacing (SLS)

CSI ... SP h

Data Structure	ASCII	CSI	n	SP	"h"	[A] set line spacing
	hex.		9B	n	20	68
	dec.		155	n	32	104

Description n specifies the line spacing

The unit is either decipoints or depends on the SSU selection (Select Size Unit, see page 8). Note also the sequence SPI (Spacing Increment, see page 15).

Character Styling

Superscript ON
Subscript ON
Microscript ON
Super-/Sub-/Microscript OFF

CSI 0 z
CSI 1 z
CSI 10 z
CSI 2 z

Data Structure	ASCII	CSI	n	"z"	[A] character styling
	hex.	9B	n	7A	
	dec.	155	n	122	

Description For n the following parameters are available:

n	hex.	dec.	character styling	
0	30	48	superscript ON	①
1	31	49	subscript ON	①
2	32	50	super-/sub-/microscript OFF	②
10	31 30	49 48	microscript ON	①

- ① These sequences switch the printer to superscript, subscript or microscript mode. The subsequent characters are printed with about 1/2 of their normal height. If superscript or subscript characters are underlined, the underline character is printed at its normal position.
- ② This sequence resets the printer to normal mode.
The base line for microprint is the same as for normal print.



The sequence **CSI 2 z** also resets double height.
(For this see also the following page 29, Double Height OFF)

Example

```
10 REM      super/sub/microscript
20 LPRINT "E=M*C";
30 LPRINT CHR$(27);"[0z";
40 LPRINT "2";
50 LPRINT CHR$(27);"[2z";
60 LPRINT " is Einsteins most famous formula."
70 LPRINT "H";
80 LPRINT CHR$(27);"[1z";"2";CHR$(27);"[2z";
90 LPRINT "O is simply water."
100 LPRINT "Micro";CHR$(27);"[10zscript";CHR$(27);"[2z";
110 LPRINT "is printed in the base line"
120 END
```

E=M*C² is Einsteins most famous formula.
H₂O is simply water.
Microscript is printed in the base line

Double Height ON (Upper Half)
Double Height ON (Lower Half)
Double Height OFF

CSI 12 z
CSI 13 z
CSI 2 z

Data Structure	ASCII hex. dec.	CSI "1" 9B 31 155	"2" 32 49	"z" 7A 122	[C] double height ON (upper half)	❶
	ASCII hex. dec.	CSI "1" 9B 31 155	"3" 33 49	"z" 7A 122	[C] double height ON (lower half)	❶
	ASCII hex. dec.	CSI "2" 9B 32 155	"z" 7A 122		[A] double height OFF	❷
Description	<ul style="list-style-type: none"> ❶ The same character must be sent to both lines to form a full character. Afterwards double height must be reset. If only a part of the line is printed double height, the positioning of upper/lower half must be done by spaces. The line spacing should be set to 1/6 inch. ❷ This sequence also resets superscript, subscript and microscript. 					
	Note: For selection of double height together with the proportional mode or other print attributes the start of printing has to be identic for the top and bottom half.					

Example

```
10 REM double height
20 LPRINT "For ";CHR$(27);"[12zHeadlines ";CHR$(27);"[2z";
30 LPRINT "printing in double"
40 LPRINT CHR$(27);"[13z Headlines";CHR$(27);"[2z"
50 LPRINT "height is recommended"
60 END
```

For Headlines printing in double
height is recommended

Print Quality

CSI ... SP X
CSI ... y

Data Structure	ASCII	CSI	n	SP	"X"	[A] select print quality	①
	hex.	9B	n	20	58		
	dec.	155	n	32	88		
	ASCII	CSI	n	"y"		select print quality	②
	hex.	9B	n	79			
	dec.	155	n	121			

Description ① This sequence defines the print quality. Print throughput changes with the print quality.
For n the following parameters are available:
(printer menu setting is valid)

n	hex.	dec.	print quality
0	30	48	[A] [B] high
1	31	49	[A] medium
2	32	50	[A] low

② With the sequence **CSI n y** for n the following parameters are available:

n	hex.	dec.	typeface
0	30	48	[A] draft print quality (DPQ)
1	31	49	[A] near letter quality (NLQ)
4	34	52	[C] NLQ at 10 cpi
5	35	43	[C] NLQ at 12 cpi
11	31 31	49 49	[B] fast draft print quality
12	31 32	49 50	[A] letter print quality (LQ) - e.g. 24*36 matrix
13	31 33	49 51	[B] high resolution print quality - e.g. 24*48 matrix

Example

```
10 REM      print quality
20 LPRINT CHR$(27);"[0yThis is draft quality ";
30 LPRINT CHR$(27);"[1yand this is NLQ printing."
40 LPRINT CHR$(27);"[5yThis is NLQ with 12 cpi."
50 END
```

This is draft quality and this is NLQ printing.
This is NLQ with 12 cpi.

Data Structure	ASCII hex. dec.	CSI n 9B n 155	"m" 6D 109	[A] select typestyle
-----------------------	-----------------------	----------------------------	------------------	----------------------

Description This sequence defines the typestyle.

For n the following parameters are available:

n	hex.	dec.	typestyle (number is printer dependent)
10	31 30	49 48	font 0
11	31 31	49 49	font 1
12	31 32	49 50	font 2
13	31 33	49 51	font 3
14	31 34	49 52	font 4
15	31 35	49 53	font 5
16	31 36	49 54	font 6
17	31 37	49 55	font 7
18	31 38	49 56	font 8
19	31 39	49 57	font 9
0	30	48	clear all selected fonts

Depending on the value specified for n, one of the internal printer fonts or a font of an optional font card is selected. Refer to the Operator's Manual for information on printer-resident fonts and font cards which can be installed.



The order of the font 0 to font 9 not corresponds to the fonts displayed on your printer. The sequence and allocation is defined by the sequence **CSI n₁ ; n₂ SP D** (see FNT, Font Selection, page 43).

A maximum of 16 CSI...m -sequences can be joined in one sequence: e.g. as follows:
CSI n₁ ; n₂ ; n_x m.

Example

Valid for most MTPL printers.

Fontregister	Font
0	Draft
1	NLQ Courier
2	LQ Courier
3	NLQ Sans Serif
4	LQ Sans Serif
5	LQ Roman
6	LQ Script
7	LQ Prestige
8	LQ OCR-B
9	LQ OCR-A

Emphasized Mode ON
Emphasized Mode OFF

CSI = z
CSI > z

Data Structure	ASCII	CSI	"="	"z"	[C] emphasized mode ON
	hex.	9B	3D	7A	
	dec.	155	61	122	
	ASCII	CSI	"z"	[C] emphasized mode OFF	
	hex.	9B	3E	7A	
	dec.	155	62	122	

Description During printing in emphasized mode, each dot is printed twice, slightly shifted in horizontal direction.
Emphasized mode can be used in all print qualities and character densities.

Example

```
10 REM      emphasized mode
20 LPRINT CHR$(27);"[z";"this is printed in the normal mode"
30 LPRINT CHR$(27);"[=z";"and this in the emphasized one"
40 END
```

```
this is printed in the normal mode
and this in the emphasized one
```

Italic Mode ON
Italic Mode OFF

CSI 3 m
CSI 23 m

Data Structure	ASCII	CSI "3" "m"	[A] italic mode ON
	hex.	9B 33 6D	
	dec.	155 51 109	
	ASCII	CSI "2" "3" "m"	[A] italic mode OFF
	hex.	9B 32 33 6D	
	dec.	155 50 51 109	



The sequence **CSI 0 m** resets all CSI...m-sequences!

A maximum of 16 CSI...m -sequences can be joined in one sequence, e.g. as follows:
CSI n₁;n₂;n_x m

Example

```
10 REM italic mode
20 LPRINT CHR$(27);"[3m"
30 GOSUB 70
40 LPRINT CHR$(27);"[23m"
50 GOSUB 70
60 END
70 LPRINT "Matrix Printer"
80 RETURN
```

Matrix Printer
Matrix Printer

Proportional Mode ON (SGR)

CSI 26 m
CSI 2 y
CSI 50 m
CSI 7 y

Proportional Mode OFF

Data Structure	ASCII	CSI "2"	"6"	"m"	[A] proportional mode ON
	hex.	9B	32	36	6D
	dec.	155	50	54	109
	ASCII	CSI "2"	"y"		[C] proportional mode ON
	hex.	9B	32	79	
	dec.	155	50	121	
	ASCII	CSI "5"	"0"	"m"	[A] proportional mode OFF
	hex.	9B	35	30	6D
	dec.	155	53	48	109
	ASCII	CSI "7"	"y"		[C] proportional mode OFF
	hex.	9B	37	79	
	dec.	155	55	121	

Description

When in default font type, all characters are assigned a fixed, equally wide space. When in proportional mode, the spaces between each character are set to the actual width of the characters; on account of these “proportional spaces” reading of the text becomes more easy.

Various font types basically are printed in proportional mode, e.g. Script, Kaufmann etc.



The sequence **CSI 0 m** resets all CSI...m-sequences!

A maximum of 16 CSI...m -sequences can be joined in one sequence, e.g. as follows:
CSI n1;n2;nx m

Example

```
10 REM      proportional spacing
20 LPRINT CHR$(27);"[2y";
30 LPRINT "this is an example with proportional spacing"
40 LPRINT CHR$(27);"[7y";
50 LPRINT "this is an example with normal spacing"
60 END
```

this is an example with proportional spacing
this is an example with normal spacing

Underline Mode ON (SGR)

**CSI 4 m
CSI 21 m
CSI 24 m**

Underline Double Mode

Underline Mode OFF

Data Structure	ASCII	CSI "4" "m"	[A] underline mode ON	①
	hex.	9B 34 6D		
	dec.	155 52 109		
	ASCII	CSI "2" "1" "m"	[A] underline double mode	
	hex.	9B 32 31 6D		
	dec.	155 50 49 109		
	ASCII	CSI "2" "4" "m"	[A] underline mode OFF	
	hex.	9B 32 34 6D		
	dec.	155 50 52 109		

- Description** ① All printed characters including spaces are automatically unlined. Spaces between tab codes (HT) are underlined.



The sequence **CSI 0 m** resets all CSI...m-sequences!

A maximum of 16 CSI...m -sequences can be joined in one sequence, e.g. as follows:
CSI n1;n2;nx m

Example

```

10 REM      underline mode
20 LPRINT "the most ";
30 LPRINT CHR$(27);"[4m";
40 LPRINT "important";
50 LPRINT CHR$(27);"[24m";
60 LPRINT " word must be underlined."
70 END
  
```

the most important word must be underlined.

Overline Mode ON (SGR)

CSI 53 m
CSI 55 m

Data Structure	ASCII	CSI	"5"	"3"	"m"	[A] overline mode ON
	hex.	9B	35	33	6D	
	dec.	155	53	51	109	
	ASCII	CSI	"5"	"5"	"m"	[A] overline mode OFF
	hex.	9B	35	35	6D	
	dec.	155	53	53	109	

Description This sequence switches the automatic overline function on or off. When the automatic overline function is on, all printed characters including spaces are automatically underlined (also see SGR, Underline Mode ON, previous page 39).



The sequence **CSI 0 m** resets all CSI...m-sequences!

A maximum of 16 CSI...m -sequences can be joined in one sequence, e.g. as follows:
CSI n1;n2;nx m

Double Strike ON
Double Strike OFF

CSI 9 w
CSI 8 w

Data Structure	ASCII	CSI "9"	"w"	[B] [C] double strike print mode ON
	hex.	9B	39	77
	dec.	155	57	119
	ASCII	CSI "8"	"w"	[B] [C] double strike print mode OFF
	hex.	9B	38	77
	dec.	155	56	119

Description In double strike mode characters are printed twice in two printing passes. Double strike mode can be used in all print qualities and character densities. Double strike mode can also be used in combination with emphasized mode.



The use of this sequence in combination with LQ and emphasized printing is not recommended.

Example

```
10 REM double strike
20 LPRINT CHR$(27);"[8w";
30 LPRINT "this is normal printing";
40 LPRINT CHR$(27);"[9w";
50 LPRINT "and this is double strike printing"
60 END
```

this is normal printing

and this is double strike printing

Graphic Size Selection (GSS)

Graphic Size Modification (GSM)

CSI ... SP C
CSI ... SP B

Data Structure	ASCII	CSI	n	SP	"C"	[B] graphic size selection	①
	hex.	9B	n	20	43		
	dec.	155	n	32	67		
	ASCII	CSI	n ₁	;	n ₂	SP	"B"
	hex.	9B	n ₁	3B	n ₂	20	42
	dec.	155	n ₁	59	n ₂	32	66

Description

- ① n specifies the height of the used font

The units are either decipoints or defined by the SSU function (Select Size Unit, see page 8).

The width is implicitly defined by the height.

Example:

CSI 120 SP C set 12 point font (= 120 decipoints)

- ② n₁ specifies the height of the used fonts (default setting: 100)

n₂ specifies its width (default setting: 100)

These parameters are given as a percent value of the size establishment by sequence ①.

Example:

CSI SP B standard height and width

CSI 50 ; 50 SP B half sized characters (e.g. for indices or exponents)

CSI 200 ; 200 SP B double sized characters (e.g. for headlines)

CSI 100 ; 67 SP B compresses a 10 pitch font for 15 cpi



If the selected character size is not printable, the next available character size is used.

Font Designation (FNT)

CSI ... SP D

Data Structure	ASCII	CSI	n ₁	:	n ₂	SP	"D"	[A] designate font
	hex.	9B	n ₁	3B	n ₂	20	44	
	dec.	155	n ₁	59	n ₂	32	68	

Description n₁ = font number 0...9
 n₂ = identification (ID) of the desired font

For n₂ the following parameters are available:

n ₂	hex.	dec.	identification
0	30	48	Roman
1	31	49	Sans Serif
2	32	50	Courier
3	33	51	Prestige
4	34	52	Script
5	35	53	OCR B
6	36	54	OCR A
7	37	55	Modern
8	38	56	Kaufmann
9	39	57	Gothic
10	31 30	49 48	Swiss
11	31 31	49 49	Quadrato
66	36 36	54 54	Courier IBM

The first parameter (n₁) selects one of ten font registers to which the second parameter (n₂) designates one font of the whole repertory in the device. With the sequence CSI 1...m the designated font can be selected (see page 33, Select Typestyle).

n₁ is in the range of zero to nine and selects primary font, first alternate font etc. up to the nineth alternate font.

The second parameter (n₂) is defined by your printer type and represents an identification of the desired font.



Font attributes, e.g. "bold" can be specified after designation through corresponding ESC sequences.

Technical Details Font Designation Codes

The use of the font designation code **CSI**n₁;n₂space **D** needs further explanation. (Note: CSI is 9B; you can use ESC[, 1B 5BH, instead if you wish.)

The parameter n₁ Register to use.

This parameter can take values of 0 to 9. The default allocation of fonts to these registers is given in the printer's manual.

The parameter n₂ What to put in the register.

This parameter is held as a 16 bit number in the printer. It is made up as below:

The lower eight bits (0 to 255)

These encode the typeface and are as given in the manual with the exception that 5 is OCR-B and 6 is OCR-A.

0 = Roman	1 = Sans Serif	2 = Courier	4 = Script
5 = OCR-B	6 = OCR-A	7 = Modern	8 = Kaufmann
9 = Gothic	10 = Helvette	11 = Quadrato	66 = Courier IBM

The upper eight bits

Only bits 9 (512H) and 11 (2048H) are used. All the other bits must be left at 0. Bits 9 and 11 set print quality: Bit 11 Bit 9

0	0	Letter Quality
0	1	Draft
1	0	Near Letter Quality
1	1	Reserved

When Draft (01) is selected the lower eight bits have a new meaning:

0 = Multicopy Draft 1 = Fast Draft 2 = Normal Draft

to specify a type face with a print quality add the decimal values and convert to an ASCII string.

Example 1: Courier LQ = 00 + 2 Number = 2

Example 2: Script NLQ = 10 (2048) + 4 Number = 2052

Example 3: Draft = 01 (512) + 1 Number = 513

So **CSI7;513 D** i.e.: 9B 37 3B 35 31 33 20 44H (or **ESC[7;513 D** i.e. 1B 5B 37 3B 35 31 33 20 44 H) will put Fast Draft in font register 7. The sequence **ESC[17m** will select this register as the font to use.

Print Positioning

Horizontal Tab Stop

HT

Data Structure	ASCII	HT	[A] horizontal tab stop
	hex.	09	
	dec.	9	

Description	The HT-Code moves the active print position to the next horizontal tabulation stop on the same line. If there is no tab stop reachable - no more tab stops are set or the next tab stop is beyond the defined right margin - spaces are inserted. The graphic renditions, e.g. underlining, overscoring etc., being active during the tab is executed, apply also to the whitespace produced by two tab stops.
--------------------	---

Set Horizontal Tab Stop at Current Position

HTS

Data Structure	ASCII	HTS	[A] set horizontal tab stop
	hex.	88	
	dec.	136	

Description	This code sets a tab stop at the current horizontal position.
--------------------	---

Horizontal Tab Stops ON

**CSI ... u
ESC H
CSI ... g**

Horizontal Tab Stops OFF (TBC)

Data Structure	ASCII hex. dec.	CSI n1 "u" 9B n1 75 155 n1 117	[A] set horizontal tab stop	❶
	ASCII hex. dec.	ESC "H" 1B 48 27 72	[C] set horizontal tab stop at current position	❷
	ASCII hex. dec.	CSI n "g" 9B n 67 155 n 103	[A] clear all horizontal tab stops	❸
Description	❶	Print width 8 inches n ₁ = 1... 80 at 10 cpi = 1... 96 at 12 cpi = 1...120 at 15 cpi = 1...136 at 17.1 cpi = 1...160 at 20 cpi	Print width 13.6 inches = 1...136 at 10 cpi = 1...163 at 12 cpi = 1...204 at 15 cpi = 1...232 at 17.1 cpi = 1...272 at 20 cpi	

Values for n₁ are valid for a line length of 8 inches (80-column printer) or 13.6 inches (136-column printer) set in the menu.

Up to 16 tab stops can be joined in one sequence as follows:

CSI n₁ ; n₂ ; n₃ ; ... ; n₁₆ u

The parameters do not have to be sorted. The positions of the horizontal tab stops depend on the current character density.

- ❷ This sequence is interpreted as a Epson/IBM-sequence (ESC H ≡ LQ off), if the emulation MTPL+Epson/IBM is set.

③ With the sequence **CSI n g** for n the following parameters are available:

n	hex.	dec.	function
0	30	48	clear horizontal tab stop at current position
2	32	50	clear all horizontal tab stops in current line
3	33	51	clear all horizontal tab stops in all lines

Examples:

CSI g clear horizontal tab stop at current position

CSI 3;4 g clear all horizontal and vertical tab stops

(for this also see page 52, Vertical Tab Stops ON/OFF)



Later changes of character density will not influence the physical position of the tab stops.

A horizontal tabulation is executed by the HT control code (hex.09, dec.9); for this see page 45, Horizontal Tab Stop.

Example 1

```
10 REM      horizontal tabs
20 LPRINT CHR$(27);"[4w";:REM 10 cpi
30 LPRINT CHR$(27);"[10;20;30u";
40 LPRINT "123456789012345678901234567890123456789"
50 GOSUB 110
60 LPRINT CHR$(27);"[0w";:REM 5 cpi
70 GOSUB 110
80 LPRINT CHR$(27);"[11w";:REM 20 cpi
90 GOSUB 110
100 END
110 LPRINT CHR$(9);"tab1";
120 LPRINT CHR$(9);"tab2";
130 LPRINT CHR$(9);"tab3"
140 RETURN
```

```
123456789012345678901234567890123456789
      tab1      tab2      tab3
    tab1    tab2    tab3
tab1          tab2          tab3
```

Example 2

```
10 FOR I=1 TO 3
20 LPRINT "1234567890";CHR$(27);"H";
30 NEXT I
40 LPRINT
50 FOR J=1 TO 3
60 LPRINT CHR$(9);"tab";
70 NEXT J
80 LPRINT
90 END
```

```
123456789012345678901234567890
      tab      tab      tab
```

Line Feed

LF

Data Structure	ASCII	LF	[A] line feed
	hex.	0A	
	dec.	10	

Description When the printer receives this code, it prints all the data in the print buffer, then advances the paper one line.

The LF code can also give a carriage return if automatic carriage return is selected. If no CR is given, the next printing starts in the column following the end of printing.

The amount by which the paper is advanced depends on the current line spacing. The default line spacing of the printer is 1/6 inch.

Vertical Tab Stop

VT

Data Structure	ASCII hex. dec.	VT 0B 11	vertical tab stop
-----------------------	-----------------------	----------------	-------------------

Description	<p>When the printer receives this code, it prints all the data in the print buffer, then advances the paper to the next vertical tab stop position.</p> <p>The VT code can also give a carriage return if automatic carriage return is selected (refer to Operator's Manual). If no CR is given, the next printing starts in the column following the end of printing.</p> <p>The amount by which the paper is advanced depends on the current line spacing. After switching on the printer no vertical tab stops are set (default configuration). If there are no vertical tab stops between the current print position and the end of the page, or if there are no vertical tab stops set, VT assumes the same function as LF.</p>
--------------------	--

Set Vertical Tab Stop at Current Position

VTS

Data Structure	ASCII	VTS	[A] set vertical tab stop
	hex.	8A	
	dec.	138	

Description This code sets an horizontal tab stop at the current vertical position.

Vertical Index

IND

Data Structure	ASCII	IND	[A] vertical index
	hex.	84	
	dec.	132	

Description The code IND moves the active print position to the following line. The difference to Line Feed (LF) is that IND does not permit an CR option.

Vertical Tab Stops ON
Vertical Tab Stops OFF (TBC)

CSI ... v
CSI 1 g
CSI 4 g

Data Structure	ASCII hex. dec.	CSI 9B 155	n n n	"v" 76 118	[A] set vertical tab stop	①
	ASCII hex. dec.	CSI 9B 155	"1" 31 49	"g" 67 103	[A] clear all vertical tab stops at current position	
	ASCII hex. dec.	CSI 9B 155	"4" 34 52	"g" 67 103	[A] clear all vertical tab stops	

Description ① n = 1...132 lines at a line spacing of 1/6 inch (6 lpi)
= 1...176 lines at a line spacing of 1/8 inch (8 lpi)

Up to 16 tab stops can be joined in one sequence as follows:

CSI n1 ; n2 ; n3 ; ... ; n16 v

The parameters do not have to be sorted. The positions of the horizontal tab stops depend on the current character density.

Examples:

CSI g clear horizontal tab stop at current position

CSI 3;4 g clear all horizontal and vertical tab stops

(for this also see page 46, Horizontal Tab Stops ON/OFF)



Later changes of character density will not influence the physical position of the tab stops.

A vertical tabulation is executed by the VT control code (hex.0B, dec.11); also see page 50, Vertical Tab Stop.

Example

```
10 REM      vertical tabs
20 LPRINT CHR$(27);"[10t";:REM set form length
30 LPRINT CHR$(27);"[4g";:REM clear all vtabs
40 LPRINT CHR$(27);"[3;5;9v";
50 LPRINT CHR$(11);"this is the first vertical tab, line 3"
60 LPRINT CHR$(11);"this is the second vertical tab, line 5"
70 LPRINT CHR$(11);"this is the third vertical tab, line 9"
80 END
```

this is the first vertical tab, line 3

this is the second vertical tab, line 5

this is the third vertical tab, line 9

Data Structure	ASCII	CSI	n	" "	[A] set horizontal position absolute
	hex.		9B	n	60
	dec.		155	n	96

Description n = 1 (default setting) \triangleq current left margin

This sequence moves the print head to a horizontal print position absolute.

The unit depends on PUM (Positioning Unit Mode) and is either character positions or defined by the SSU-function (Select Size Unit, see page 8).

Example:

CSI 40 ' next character goes to position 40

CSI ' next character goes to the left margin



Positions outside the right margin are ignored.

Make sure you do not confuse the character " " with the apostrophe " ' " !

Horizontal Position Relative (HPR)

CSI ... a

Data Structure	ASCII	CSI n	"a"	[A] set horizontal position relative
	hex.	CSI n	61	
	dec.	CSI n	97	

Description n = 1 (default setting)

This sequence moves the print head to the right.

The unit depends on PUM (Positioning Unit Mode) and is either character positions or defined by the SSU-function (Select Size Unit, see page 8).

Example:

CSI 8 a next character goes 8 positions to the right
CSI a next character goes one position to the right



Positions beyond the right margin are ignored.

Horizontal Position Backward (HPB)

CSI ... j

Data Structure	ASCII	CSI	n	"j"	[A] set horizontal position backward
	hex.		9B	n	6A
	dec.		155	n	106

Description	n = 1 (default setting)
--------------------	-------------------------

This sequence moves the print head to the left.

The unit depends on PUM (Positioning Unit Mode) and is either character positions or defined by the SSU-function (Select Size Unit, see page 8).

Example:

CSI 8 j	next character goes 8 positions to the left
CSI j	next character goes one position to the left



Positions outside the left margin are ignored.

Data Structure	ASCII	CSI	n	d	[A] set vertical position absolute
	hex.		9B	n	64
	dec.		155	n	100

Description n = 1 (default setting) \triangleq current top margin

This sequence moves the print head to a vertical print position absolute.

The unit depends on PUM (Positioning Unit Mode) and is either lines or defined by the SSU-function (Select Size Unit, see page 8).

Example:

CSI 40 d move the active print position to line (or vertical position) 40
CSI d move the active print position to top margin



Positions outside the bottom margin are ignored.

Data Structure	ASCII	CSI	n	"e"	[A] set vertical position relative
	hex.		9B	n	65
	dec.		155	n	101

Description n = 1 (default setting)

This sequence moves the print head lines or vertical positions down.

The unit depends on PUM (Positioning Unit Mode) and is either lines or defined by the SSU-function (Select Size Unit, see page 8).

Example:

CSI 12 e move print position 12 lines (or vertical positions) down
CSI e move print position one line down



Positions beyond the bottom margin are ignored.

Vertical Position Backward (VPB)

CSI ... k

Data Structure	ASCII	CSI	n	"k"	[A] set vertical position backward
	hex.		9B	n	6B
	dec.		155	n	107

Description n = 1 (default setting)

This sequence moves the print head lines or vertical positions upward.

The unit depends on PUM (Positioning Unit Mode) and is either lines or defined by the SSU-function (Select Size Unit, see page 8).



Positions beyond the top margin are ignored. This sequence is not valid in Single Sheet Mode.

Data Structure ASCII CSI n₁ ; n₂ "f" [B] [C] set horizontal and vertical position absolute
 hex. 9B n₁ 3B n₂ 66
 dec. 155 n₁ 59 n₂ 102

This sequence moves the print head to a horizontal and vertical print position absolute.

The unit depends on PUM (Positioning Unit Mode) and is either lines or defined by the SSU-function (Select Size Unit, see page 8).

Example:

CSI f move the print position to the top left position on page

CSI 20 ; 35 f move the print position to line (vertical position) 20 and horizontal character position 35
(if PUM is turned off)



Note that during manual and automatic cut sheet feeding your printer can only reverse the form a limited distance.

Backspace

BS

Data Structure	ASCII	BS	[A] Backspace
	hex.	08	
	dec.	8	

Description After receiving this code the content of line buffer is printed out.

Then, the print head is moved one position to the left (depending on the current values of cpi).

Carriage Return

CR

Data Structure	ASCII	CR	[A] carriage return
	hex.	0D	
	dec.	13	

Description When the printer receives this code, it prints any data in the print buffer and resets the line pointer. The active print position is set to the left margin (first possible character position).

The code CR can also give a line feed if automatic line feed is selected (refer to Operator's Manual).

Data Structure	ASCII	FF	[A] form feed
	hex.	0C	
	dec.	12	

Description When the printer receives this code, it prints the data in the print buffer, then advances the paper from the current print position to the top-of-form position on the next page.

Cut sheet:

Forms are ejected. The first print position on the following paper is the first (top) physically possible position.

Fanfold paper:

The paper is moved by the form length given before. The first print position on the following paper is the first (top) physically possible position.

The FF code can also give a carriage return if automatic carriage return is selected (refer to Operator's Manual). The next print is started in the column following the print end of the last print-out if no CR is transmitted.

After switching on the printer the default form length is set to 12 inches (72 lines) per page (Europe 12"; USA 11").

Partial Line Down

PLD

Data Structure	ASCII	PLD	[A] partial line down
	hex.	8B	
	dec.	139	

Description If the preceding character is in normal position, PLD moves the active position down to a sufficient distance to give the following characters the appearance of being subscripted. If the preceding character is in a superscript position, PLD moves to normal position.

Partial Line Up

PLU

Data Structure	ASCII	PLU	[A] partial line up
	hex.	8C	
	dec.	140	

Description If the preceding character is in normal position, PLU moves the active position up a sufficient distance to give the following characters the appearance of being superscripted. If the preceding character is in a subscript position, PLU moves to normal position.

Reverse Index

RI

Data Structure	ASCII	RI	[B] reverse index
	hex.	8D	
	dec.	141	

Description The code RI moves the active position to the preceding line. An CR option is not permitted.

Next Line

NEL

Data Structure	ASCII	NEL	[B] next line
	hex.	85	
	dec.	133	

Description The code NEL moves the active position to the left margin of the next line. This gives the same result as the combination of CR (Carriage Return) and LF (Line Feed).

Graphics

Graphic Modes

ESC % ...
CSI 6 z
CSI 5 z

Data Structure	ASCII	ESC	"%"	n	n1	;	n2	;	DATA	[C] set dpi for graphics
	hex.	1B	25	n	n1	3B	n2	3B	DATA	
	dec.	27	37	n	n1	59	n2	59	DATA	
	ASCII	CSI	"6"	"z"						[C] graphics invers
	hex.	9B	36	7A						
	dec.	155	54	122						
	ASCII	CSI	"5"	"z"						[C] graphics unchanged
	hex.	9B	35	7A						
	dec.	155	53	122						

Description For n the following parameters are available:

n	dpi		
3	33	51	graphics 60 dpi
4	34	52	graphics 120 dpi
5	35	53	graphics 80 dpi
6	36	54	graphics 240 dpi
7	37	55	graphics 240 dpi
8	38	56	graphics 72 dpi
9	39	57	graphics 90 dpi

Data following the graphic-CSI-sequence are printed out as dot pattern. n₁ and n₂ define the length of the data sequence.



The vertical resolution is 72 dpi.

The graphics image is printed vertically closed at a line feed of 80/720 inch. (Also see the sequences Spacing Increment (SPI), page 15, and Set Line Spacing (SLS), page 26. Example: **CSI 80 ; SP G**).

Example for calculation of n_1 and n_2 :

The length of graphics is 80 bytes.

$$\begin{aligned} n_2 &= \text{number of bytes divided by 256} \\ &= \text{int}(80/256) \\ &= \text{dec.0} \\ &= \text{hex.00} \end{aligned}$$

$$\begin{aligned} n_1 &= \text{remainder of division of } n_2 \\ &= 80 \bmod 256 \\ &= \text{dec.80} \\ &= \text{hex.50} \end{aligned}$$

Graphics data and text data can be mixed within one line.

24 Relationship between graphics data and needles:

Needle	Data byte
1/3	Bit 7
4/5	Bit 6
6/8	Bit 5
9/10	Bit 4
11/13	Bit 3
14/15	Bit 2
16/18	Bit 1
19/20	Bit 0

9 Relationship between graphics data and needles:

Needle	Data byte
1	Bit 7
2	Bit 6
3	Bit 5
4	Bit 4
5	Bit 3
6	Bit 2
7	Bit 1
8	Bit 0

Example 1

```
10 REM bit image print
20 WIDTH "LPT1:",255
30 LPRINT CHR$(27);"%3";CHR$(80);CHR$(0);
40 GOSUB 100:LPRINT " 60 dpi"
50 LPRINT CHR$(27);"%4";CHR$(80);CHR$(0);
60 GOSUB 100:LPRINT " 120 dpi"
70 LPRINT CHR$(27);"%7";CHR$(80);CHR$(0);
80 GOSUB 100:LPRINT " 240 dpi"
90 END
100 FOR N=1 TO 80
110 LPRINT CHR$(255);
120 NEXT N
130 RETURN
```

Example 2

```
10 REM bit image print
20 WIDTH "LPT1:",255
30 LPRINT CHR$(27);"%3";CHR$(10);CHR$(0);
40 GOSUB 130:REM 60 dpi
50 LPRINT CHR$(27);"%4";CHR$(10);CHR$(0);
60 GOSUB 130:REM 120 dpi
70 LPRINT CHR$(27);"[6z";
80 LPRINT CHR$(27);"%3";CHR$(10);CHR$(0);
90 GOSUB 130:REM reverse 60 dpi
100 LPRINT CHR$(27);"[5z";
110 LPRINT
120 END
130 RESTORE
140 FOR I=1 TO 10
150 READ D
160 LPRINT CHR$(D);
170 NEXT I
180 LPRINT "    ";
190 RETURN
200 DATA 34,80,138,0,143,0,138,80,34,0
```



Miscellaneous

Load Menu

CSI ... SP q

Data Structure	ASCII	CSI	n	SP	"q"	[B] load menu
	hex.	9B	n	20	71	
	dec.	155	n	32	113	

Description For n the following parameters are available:

n	hex.	dec.	Loading of
0	30	48	Default menu
1	31	49	Menu No. 1
2	32	50	Menu No. 2
3	33	51	Menu No. 3
4	34	52	Menu No. 4 (reserved)

Up to 3 (4) various configurations can be saved with the printer.

Setting the configuration is made by the control panel of the printer (refer to Operator's Manual, chapter 2, "Menu").

Example:

CSI 0 SP q or CSI SP q load default menu



By using this sequence all settings changed by sequences are reset!

Automatic Gap Adjustment (AGA) Direct Setting of the Print Head Distance

CSI ... + z
CSI ... + y

Data Structure	ASCII hex. dec.	CSI n 9B n 155 n	"+"	"z" 7A 122	[B] automatic gap adjustment	❶
	ASCII hex. dec.	CSI n 9B n 155 n	"+"	"y" 2B 43	[B] direct setting of the print head distance	❷

Description ❶ For the sequence **CSI n + z** the following parameters are available for n:

n	hex.	dec.	Adjustment (automatic)
0	30	48	automatic adjustment OFF (print head distance must be set at the printer)
1	31	49	automatic adjustment ON

❷ For the sequence **CSI n + y** the following parameters are available for n:

n	hex.	dec.	Setting (direct)
0	30	48	Default value (is set at the printer)
<i>n</i>			print head distance in <i>n</i> -steps



Setting the print head distance accords to the respective paper path selected. Unit, adjust range and default setting depend on the device used.
If the Automatic Gap Adjustment is set to ON, the sequence ❷ is ignored.

Example:

Settings of T2060: Unit = 10 Micrometers
 Adjust range = 1 – 100
 Default value = 18

Paper Handling

CSI Ps1 Ps2 Ps3 Pn4 Pn5 + v

Data Structure	ASCII CSI Ps1 Ps2 Ps3 Pn4 Pn5 "+" "v"
	hex. 9B Ps1 Ps2 Ps3 Pn4 Pn5 2B 76
	dec. 155 Ps1 Ps2 Ps3 Pn4 Pn5 43 118
Description	Ps1 missing or 0: 1: Printhead does not lift off at the fold Printhead lifts off at the fold
Ps2 missing or 0: 1: Printhead position at left margin during paper movement allowed Printhead position at left margin during paper movement not allowed	Printhead position at left margin during paper movement allowed Printhead position at left margin during paper movement not allowed
Ps3 missing or 0: 1: Printhead position at right margin during paper movement allowed Printhead position at right margin during paper movement not allowed	Printhead position at right margin during paper movement allowed Printhead position at right margin during paper movement not allowed
Pn4 missing or <20 or >136: 20 ... 136: Pn5 missing or 0 or >30: 1 ... 20:	No limitation of print width Print width in 1/10 inch No displacement of the start of the print area (left margin); Displacement of the start of the print area in 1/10 inches

Shared Interface

CSI Pn + w

Data Structure	ASCII CSI Pn "+" "w"
	hex. 9B Pn 2B 77
	dec. 155 Pn 43 119
Description	Sequence to set hold time of shared I/O after selecting alternate interface.
Pn missing or 0:	Sequence ignored
Pn 1 ... 30:	Hold time in seconds



Shared I/O has to be selected in the printer's menu. Default = 30 s.

Data Structure	ASCII hex. dec.	CSI 9B n	n 6D 109	"m"	[A] set colors
-----------------------	-----------------------	----------------	----------------	-----	----------------

Description For n the following parameters are available:

n	hex.	dec.	color selection	
0	30	48	reset color	
1	31	49	bold or increased intensity	
2	32	50	alternate color or decreased intensity	①
22	32 32	50 50	cancels functions of parameters 1 and 2 (normal color or normal intensity)	
30	33 30	51 48	black	
31	33 31	51 49	red	
32	33 32	51 50	green	
33	33 33	51 51	yellow	②
34	33 34	51 52	blue	
35	33 35	51 53	magenta-red	②
36	33 36	51 54	cyan-blue	②
39	33 39	51 57	default color blac	

① red or magenta, depending on the ribbon used

② only available with multi color ribbon

The available colors depend on the ribbon used and must be matched in the menu. If a ribbon with several black tracks is used, then it is automatically switched every new page between the tracks.

The relationship between tracks and colors is shown in the following table:

track	yellow, cyan, magenta, black (YMCK)	red, green, blue, black (RGBK)	3 * black, red
1	black	black	black
2	cyan	blue	black
3	magenta	green	black
4	yellow	red	red

The relationship between color selection sequences and the resulting colors for several ribbon cassettes is shown in the following table:

selected color	yellow, magenta, cyan, black (YMCK)	red, green, blue, black (RGBK)	3 * black, red
black	black	black	black
red	red *)	red	red
green	green **)	green	****)
yellow	yellow	green	****)
blue	blue ***)	blue	****)
magenta	magenta	red	red
cyan	cyan	blue	****)

* red = yellow + magenta
 ** green = yellow + cyan
 *** blue = magenta + cyan
 **** sequence is ignored

}

two-pass print is automatically executed



The sequence **CSI 0 m** resets all CSI...m -sequences! A maximum of 16 CSI...m -sequences can be joined in one sequence: e.g. **CSI n1;n2;nx m**.

Example

```

10 REM      color selection
20 LPRINT CHR$(27);"[31m";
30 LPRINT "this is written with red colour"
40 LPRINT CHR$(27);"[34m";
50 LPRINT "this is written with blue colour"
60 END

```

```

this is written with red colour
this is written with blue colour

```

Data Structure	ASCII	CSI "9"	"z"	[C] set bit 8 = 1	❶
	hex.	9B	39	7A	
	dec.	155	57	122	
	ASCII	CSI "8"	"z"	[C] set bit 8 = 0	❷
	hex.	9B	38	7A	
	dec.	155	56	122	
	ASCII	CSI "7"	"z"	[C] bit 8 unchanged	
	hex.	9B	37	7A	
	dec.	155	55	122	

- Description**
- ❶ By means of this MTPL-sequence the eighth data bit is set to “1”.
This results in accordance with the selected character set characters from the national character set or italic characters to be printed.
 - ❷ By means of this MTPL-sequence the eighth data bit is set to “0”.
This means that wrong character printing caused by the eighth data bit set high by the system can be avoided.



CSI 9 z is ignored
 – if Extended Character Set is selected,
 – if Graphic Mode is selected



Note that following the sequence **CSI 8 z** all subsequent control sequences must begin with an “**ESC [**”, because CSI (9B) cannot be represented by a 7 bit code. This remains in effect until the printer receives either the sequence **ESC [9 z** or **ESC [7 z**.

Example

```
10 REM      input data control
20 LPRINT CHR$(27);"[7z";
30 GOSUB 90
40 LPRINT CHR$(27);"[9z";
50 GOSUB 90
60 LPRINT CHR$(27);"[8z";
70 GOSUB 90
80 END
90 FOR I=97 TO 103:LPRINT CHR$(I);:NEXT I
100 FOR I=161 TO 167:LPRINT CHR$(I);:NEXT I
110 LPRINT:LPRINT
120 RETURN
```

abcdefghijklmnøø

βΓπΣσμτίóύññøø

abcdefg! #\$%& '

Sheet Feeder/Paperway Eject Form

CSI ... {
CSI 2 J

Data Structure	ASCII	CSI	n	;	n ₁	;	n ₂	"{"	[A] set sheet feeder	
	hex.	9B	n	3B	n ₁	3B	n ₂	7B		
	dec.	155	n	59	n ₁	59	n ₂	123		
	ASCII	CSI	"2"	"J"					[C] eject form	①
	hex.	9B	32	4A						
	dec.	155	50	74						

Description With the sequence **CSI n ; n₁ ; n₂ {** for n the following parameters are available:

n	hex.	dec.	sheet feeder	
0	30	48	cut sheet paper (manual)	②
5	35	53	fanfold paper (tractor 1)	③
6	36	54	fanfold paper (tractor 2)	④
21	32 31	50 49	bin 1 (front)	⑤
22	32 32	50 50	bin 2 (rear)	⑤
23	32 33	50 51	bin 3 (reserved)	⑥
31	33 31	51 49	stacker 1 of the sorter	⑦
50	35 30	53 48	move paper to normal print position (return of view- or tear-off position)	⑧
51	35 31	53 49	move paper to tear-off position	⑨
52	35 32	53 50	move paper to view position	⑩
51	35 31	53 49	cuts fanfold paper at the next perforation	①
54	35 34	53 52	cut is made above/below the current line	②

n₁ [C] specifies the horizontal print head position during the paper loading process
(is ignored with new printer models)

n₂ [C] specifies an optional correction value for the vertical load position in n*1/72 inches
(top of form adjustment or vertical alignment, also see "Positioning the first print
line (Phys.adj)", Operator's Manual, chapter 4).

- ① Paper is ejected also by FF or the limit, fixed by the form length or the bottom margin.
- ② This sequence selects manual cut sheet paper process.
- ③ This sequence selects fanfold paper process for tractor 1.
- ④ This sequence selects fanfold paper process for optional tractor 2. If an optional tractor 2 is installed, sequences for selecting the automatic single sheet feeder (ASF) are ignored.
- ⑤ Selection of bin 1 or 2.
Vertical alignment of the first printable line in steps of $n\frac{1}{2}$ inch downwards is optional.
 n is set to $1\frac{1}{2}$ inch (one line at 6 lpi) in the default menu.
- ⑥ Depending on the hardware, up to 9 bins can be selected.
(bin 1 - 9 \triangleq CSI 21 - CSI 29).
- ⑦ Depending on the hardware and in the case a sorter has been installed, up to 19 exit ports can be selected.
(stacker 1 - 19 \triangleq CSI 31 - CSI 49).
- ⑧ The page is set from view or tear-off position (perforation) to print position.
This means, that the print head moves to the current position or to the first possible line of the following document.
- ⑨ Independent of the menu settings the paper is set to tear-off position.
This sequence has no affect, if the respective position is just set manual (by means of the "Tear" key) or automatically (printer menu setting: Parameter group "Auto Tear").^{**}
- ⑩ Independent of the menu settings the paper is set to view position (last printed line).
This sequence has no affect, if the respective position is just set manual (by means of the "Tear" key) or automatically (printer menu setting: Parameter group "Auto Tear").
- ⑪ This sequence is only available if an optional cutter is installed and cuts fanfold paper at the next perforation.^{*})
- ⑫ This sequence is only available if an optional cutter is installed; it cuts above the current line, if the text to be printed was ended with a CR (hex. 0D, dec. 13), it cuts below the line, if the text to be printed was ended with a LF (hex. 0A, dec. 10).

The sheet feeder - if installed and connected - has to be selected via the menu of the printer (refer to the Operator's Manual).

^{*}) If a cutting device is installed.

^{**}) If no cutting device is installed.

For compatibility to former printers a sequence like **CSI 21 ; x ; n {** will also be accepted.
In this case, the parameter x will be ignored.

Paper is inserted on receipt of:

- CR (hex.0D; dec.13) if CR = LF is selected
- LF (hex.0A; dec.10)
- VT (hex.0B; dec.11)
- print data

Example

```
10 REM      sheet feeder
15 LPRINT CHR$(27);"[3t";:REM set form length
20 LPRINT CHR$(27);"[21{";
30 LPRINT "This text is on a form"
40 LPRINT "from magazine one."
50 LPRINT CHR$(12):REM form feed
60 LPRINT CHR$(27);"[22{";
70 LPRINT "This text is on a form"
80 LPRINT "from magazine two."
90 END
```

This text is on a form
from magazine one.

This text is on a form
from magazine two.

Reset to Initial State (RIS)

**ESC c
CSI 6 ~**

Data Structure	ASCII	ESC "c"	[A] reset to initial state
	hex.	1B 63	
	dec.	27 99	
	ASCII	CSI "6" " ~ "	[C] reset to initial state
	hex.	9B 36 7E	
	dec.	155 54 126	

Description The printer is initialized, which means it has the same status as just after power switch-on. All parameters set by CSI-sequences are cleared. The active print position is set on the top position of a page (document).

Example

```
10 REM initialization
20 LPRINT CHR$(27);"[10s";:REM set left margin
30 LPRINT CHR$(27);"[7w";:REM set 17.1 cpi
40 LPRINT CHR$(27);"[ly";:REM set NLQ
50 LPRINT CHR$(27);"[1z";:REM set subscript
60 GOSUB 100
70 LPRINT CHR$(27);"[6~";
80 GOSUB 100
90 END
100 LPRINT "Matrix Printer"
110 LPRINT:LPRINT
120 RETURN
```

Matrix Printer

Matrix Printer

Command Set

Data Structure	ASCII	CSI	"?"	n	" ~ "	[B]	command set
	hex.	9B	3F	n	7E		
	dec.	155	63	n	126		

Description For n the following parameters are available:

n	hex.	dec.	command set
1	31	49	MTPL
2	32	50	MTPL + IBM-Graphics-Printer
3	33	51	MTPL + IBM-Proprinter XL
4	34	52	MTPL + IBM-Proprinter XL 24e
5	35	53	MTPL + EPSON FX
6	36	54	MTPL + EPSON LQ
7	37	55	MTPL + NEC P60/70
10	31 30	49 48	end of special command interpretations and return to standard command set, e.g. end of Barcode interpretation
11	31 31	49 49	start of Barcode interpretation

*) ("Tally Printer Language")

① For more information see the Barcode Programmer's Manual.

Activation of Character Sets

SI
SO
ESC ...

Data Structure	ASCII hex. dec.	SI 0F 15	ZG locking shift LS0	①
	ASCII hex. dec.	SO 0E 14	ZG locking shift LS1	②
	ASCII hex. dec.	ESC n 1B n 27 n	ZG locking shift LS2, LS3, LS1R, LS2R, LS3R	③

Description ① Activation of G0 for codes 21 - 7E

② Activation of G1 for codes 21 - 7E

③ For n the following parameters are available:

n	hex.	dec.	locking shift (LS)
n	6E	110	[B] LS2: Activation of G2 for codes 21 - 7E
o	6F	111	[B] LS3: Activation of G3 for codes 21 - 7E
|	7C	124	[B] LS3R: Activation of G3 for codes A1 - FE
}	7D	125	[B] LS2R: Activation of G2 for codes A1 - FE
~	7E	126	[A] LS1R: Activation of G1 for codes A1 - FE

These sequences activate various character sets (also see Invocation of Character Set G0 - G3, page 83). 4 registers - from G0 until G3 - are supported. Into each of these registers a graphic character set by a designation sequence can be placed.



A set of up to 94 characters is made ready for use.

Example

```
10  open "lpt1:" as #1
20  width #1,32000
30      'Example "Locking Shift"
40  t1$=" French Characters Are Printed"
50  t2$=" German Characters Are Printed"
60  print #1,chr$(27),"+R"  'Designate G3 <- French Substitution
70      'Table
80  print #1,chr$(27),"o"   'Locking Shift 3
90  print #1,$Öä",t1$      '(French Substitutes)
100 print #1,chr$(27),"+K" 'Designate G3 <- German Substitution
110      'Table
120 print #1,chr$(27),"o"   'Locking Shift 3
130 print #1,$Öä",t2$      '(German Substitutes)
140 end
```

Designation of Character Set G0	ESC (...
Designation of Character Set G1	ESC) ...
Designation of Character Set G2	ESC * ...
Designation of Character Set G3	ESC + ...

Data Structure ASCII ESC n F designation of character sets
 hex. 1B n F
 dec. 27 n F

Description Designation of character sets is a process by which a set of graphic symbols is connected to the usable character set registers G0, G1, G2 and G3.
 For n and F the following parameters are available:

n	hex.	dec.	character set
(	28	40	[A] G0
)	29	41	[A] G1
*	2A	42	[B] G2
+	2B	43	[B] G3
F	hex.	dec.	character set
A	41	65	US-ASCII
B	42	66	UK-ASCII
H	48	72	Swedish/Finnish
K	4B	75	German
L	4C	76	Portuguese
R	52	82	French
Y	59	89	Italian
Z	5A	90	Spanish
'	60	96	Norwegian
Ç	80	128	Table 437 (DOS Standard)
é	82	130	Table 850 (DOS Europe)
ç	87	135	Table 852 (DOS Latin 2)
à	84	132	Table 860 (DOS Portugal)

F	hex.	dec.	character set
à	85	133	Table 863 (DOS French-Canadian)
å	86	134	Table 865 (DOS Norway)
Ä	8E	142	Table 866 Standard (DOS Cyrillic)
Å	8F	143	Table 866 Ukraine
É	90	144	Table 866 Kazakhstan
æ	91	145	Kamenicky (combination of table 437 and 852)
Æ	92	146	Mazovia (code page 437 with polish characters)
p	70	112	(ASCII) Microsoft Windows™ Codepage 1250 (Latin 2)
q	71	113	(ASCII) Microsoft Windows™ Codepage 1251 (Cyrillic)
r	72	114	(ASCII) Microsoft Windows™ Codepage 1252 (Latin 1)
%	25	37	(ASCII) ISO 8859-1 (Latin 1)
&	26	38	(ASCII) ISO 8859-2 (Latin 2)
*	2A	42	(ASCII) ISO 8859-5 (Latin Cyrillic)
<	3C	60	(ASCII) Cro-ASCII character set (Codepage 437 with croatic characters)

Other character sets may be available on request.

If the mode is selected by the printer menu, the MTPL-character set US-ASCII is active (default configuration).

The slashed zero as well as the IBM and Epson character sets can only be selected via the printer control panel.



By default the graphic character set G0 is automatically activated.

This functions do not deal with printing styles like “Italic”, “Helvetica” or “Courier”. Instead, they select character sets defined by the meaning of their symbols. The meaning of the sets may be Greek or French character sets or things like math symbols and line drawing characters.

The available character sets may vary due to used printer type.

Example

```
10 REM      character sets
20 LPRINT CHR$(27);"(B";
30 LPRINT "US-ASCII:  ";:GOSUB 130
40 LPRINT CHR$(27);"(A";
50 LPRINT "UK-ASCII:  ";:GOSUB 130
60 LPRINT CHR$(27);"(K";
70 LPRINT "GERMAN :  ";:GOSUB 130
80 LPRINT CHR$(27);"(R";
90 LPRINT "FRENCH :  ";:GOSUB 130
100 LPRINT CHR$(27);"(Y";
110 LPRINT "ITALIAN :  ";:GOSUB 130
120 END
130 LPRINT CHR$(35);CHR$(36);CHR$(64);
140 LPRINT CHR$(91);CHR$(92);CHR$(93);
150 LPRINT CHR$(94);CHR$(96);CHR$(123);
160 LPRINT CHR$(124);CHR$(125);CHR$(126)
170 RETURN
```

```
US-ASCII:  #$@[\]^`{|}`~-
UK-ASCII:  £$@[\]^`{|}`-
GERMAN :  #$$HÖÜ^`äöüß
FRENCH :  £$à°ç§^`éùè°
ITALIAN :  £$§°çé^ùàòèì
```

Activation of Characters

SO
SI

Data Structure	ASCII	SO	[B] ZG single shift SS2	①
	hex.	8E		
	dec.	142		
	ASCII	SI	[B] ZG single shift SS3	②
	hex.	8F		
	dec.	143		

- Description**
- ① Activation of one single character from G2 ("single shift 2").
 - ② Activation of one single character from G3 ("single shift 3").

The functions SO and SI each activate one single character of the graphic character set into the codes 21 - 7E.

The character following the code for the changeover is replaced once.

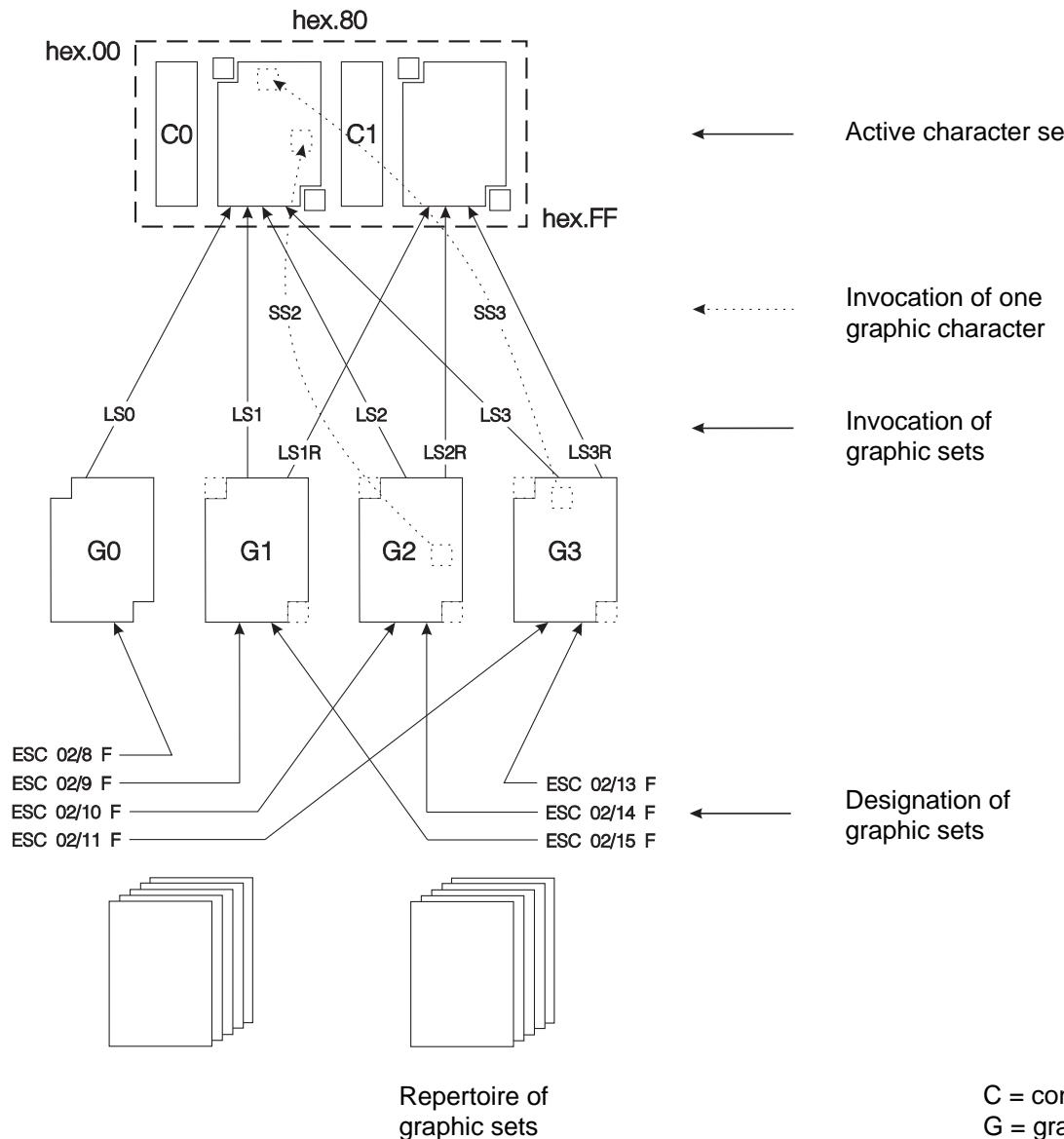


The graphic character set activated by the locking shift function (page 81, "Activation of Character Sets") will not be changed with this function.

Example

```
10  open "lpt1:" as #1
20  width #1,32000
30
40  t1$=" French a accent is printed"
50  t2$=" funny a is printed"
60  print #1,chr$(27),"+"R"  'Designate G3 <- French Substitution
70
80  print #1,chr$(143);      'Single Shift 3
90  print #1,"@",t1$        'Transfer And Print:
100 print #1,"@",t2$        'Code 40hex (French substitute)
110 print #1,"@",t2$        'Transfer And Print:
120 print #1,"@",t2$        'Code 40hex (default character)
130 end
```

Graphic description of locking shift/single shift (pages 81 - 86):



Size of Character Set (1 Character Set)**Size of Character Set (2 Character Sets)****CSI ? 50 h**
CSI ? 50 l

Data Structure	ASCII hex. dec.	CSI 9B 155	"?" 3F 63	"5" 35 53	"0" 30 48	"h" 68 104	[A] loading a character set with 256 characters	①
	ASCII hex. dec.	CSI 9B 155	"?" 3F 63	"5" 35 53	"0" 30 48	"l" 69 105	[A] loading 2 character sets with 94 characters each	②
Description								
							In an 8 bit environment, the MTPL standard allows the use of 2 character sets at the same time. In this case each character set contains 94 and 96 characters respectively and can be allocated to the lower or upper half of the code table. (Example: The control code SI activates G0 in the code range 21 - 7E and therefore loads G0 in the lower half of the code table - see also function "Activation of Character Sets" on page 79).	
							① This function causes a character set with 256 characters to be loaded by the control codes SO , SI , ESC n or ESC o . Thus, the activation of character sets with the using of the codes ESC |, ESC } and ESC ~ becomes ineffective.	
							i This function can be used, for example, to activate a table of PC code page tables.	
							② With this sequence, the function set by CSI ? 50 h is turned off. Thus, the activation of character sets with 94 and 96 characters becomes effective again.	
							STOP If the setting "Character 8/0 to 9/F printable" is active (default setting) ESC [? 53 I has to be sent instead of CSI ? 53 I , because the CSI character is not accepted as control code.	

Proportional Spacing (Draft) OFF
Proportional Spacing (Draft) ON

CSI ? 51 h
CSI ? 51 l

Data Structure	ASCII	CSI	"?"	"5"	"1"	"h"	[A] disabling proportional spacing in print quality DRAFT	①
	hex.	9B	3F	35	31	68		
	dec.	155	63	53	49	104	[A] enabling proportional spacing in print quality DRAFT (default)	②
	ASCII	CSI	"?"	"5"	"1"	"l"		
	hex.	9B	3F	35	31	69		
	dec.	155	63	53	49	105		
Description	<p>① This sequence disables proportional spacing for the print quality DRAFT. The printer switches automatically to NLQ, if DRAFT and proportional spacing are selected.</p> <p>② This sequence enables proportional spacing for the print quality DRAFT. It is the default setting.</p>							

Font Selection for NLQ/LQ only
Font Selection

CSI ? 52 h
CSI ? 52 l

Data Structure	ASCII	CSI	"?"	"5"	"2"	"h"	[A] print control ignores the font IDs of the default character generator	①
	hex.	9B	3F	35	32	68		
	dec.	155	63	53	50	104	[A] print control does not ignore the font IDs of the default character generator (default)	②
	ASCII	CSI	"?"	"5"	"2"	"l"		
	hex.	9B	3F	35	32	69		
	dec.	155	63	53	50	105		
Description	<p>① The font settings (CSI 10 ... 19 m) are only valid and can only be selected for the print qualities NLQ and LQ.</p> <p>② All print qualities (Draft, NLQ, LQ) are valid, if fonts are selected using sequence CSI 10 ... 19 m. This is the default setting.</p>							

Print Code Area Expansion ON
Print Code Area Expansion OFF

CSI ? 53 h
CSI ? 53 l

Data Structure	ASCII	CSI	"?"	"5"	"3"	"h"	[A] print code area expansion on	❶
	hex.	9B	3F	35	33	68		
	dec.	155	63	53	51	104		
	ASCII	CSI	"?"	"5"	"3"	"l"	[A] print code area expansion off	❷
	hex.	9B	3F	35	33	69		
	dec.	155	63	53	51	105		

- Description**
- ❶ This code sequence causes the printout of the higher control codes (ASCII 128 to 159) in the form of characters and symbols instead of the repetition of the functions of ASCII codes 0 to 31.
 - ❷ When the printer receives this code sequence, the ASCII codes 128 to 159 are used as duplicates of the functions of the lower control codes 0 to 31.

Print Transparent Characters

CSI Pn ... SP r

Data Structure	ASCII	CSI	Pn	...	SP	"r"
	hex.	9B	Pn	...	20	72
	dec.	155	Pn	...	32	114

- Description**
- Up to 16 numeric parameters. The parameter represents the decimal code of a printable character. If no parameter is specified, the sequence is ignored.

Example:

CSI 129 SP r: Print "Umlaut u" (if character set is PC table 437).

Data Structure	ASCII	CSI	"0"	"c"	[B] request for printer identification
	hex.	9B	30	63	
	dec.	155	48	99	
	ASCII	CSI	"?"	...	Response from printer
	hex.	9B	3F	...	63
	dec.	155	63	...	99

Description By this functions it is possible to get for example informations of device type and firmware revision or some capabilities like paper supply bins of the connected printer.



This sequence can only be used if the printer is connected to a computer with a serial interface or another bi-directional interface.

Data Structure	ASCII hex. dec.	CSI n 9B n 155 n	"n" 6E 110	[B] device status report
-----------------------	-----------------------	------------------------	------------------	--------------------------

Description For n the following parameters are available:

n	hex.	dec.	status report	direction
0	30	48	"Ready, no malfunction"	printer → computer
1	31	49	"Busy, no malfunction"	printer → computer
3	33	51	"Some malfunction detected"	printer → computer
5	35	53	Request of device status report	computer → printer

By these sequences it is possible to request the current printer status.



This sequence can only be used if the printer is connected to the computer with a serial interface or a other bi-directional interface.

The printer sends the complete sequence back to host with parameters 0, 1 or 3.

Enquiry for Status

ENQ

Data Structure	ASCII hex. dec.	ENQ 05 5	enquiry for status
-----------------------	-----------------------	----------------	--------------------

Description With this code it is possible to get a status byte from the printer:

Status byte:	Bit 0	1	= BUSY
	Bit 1	1	= offline
	Bit 2	0	= paper end
	Bit 3	1	= always 1
	Bit 4	1	= cover open
	Bit 5	1	= buffer overflow
	Bit 6	1	= parity or framing error
	Bit 7	0	= always 0



This code concerns only serial data transfer with ENQ/STX protocol.

Fill Character

NUL

Data Structure	ASCII	NUL	
	hex.	80	fill character without further meaning
	dec.	128	

Start of Text Block

STX

Data Structure	ASCII	STX	start of text block
	hex.	02	
	dec.	2	

Description	Start of a text block. With this code any error message (parity error, memory overflow) is cleared.
--------------------	--



This code concerns only serial data transfer with ENQ/STX protocol.

End of Text Block

ETX

Data Structure	ASCII	ETX	end of text block
	hex.	03	
	dec.	3	

Description	End of a text block.
--------------------	----------------------



This code concerns only serial data transfer with ACK/NAK protocol.
For a detailed description see the documentation which comes with your printer.

Positive Acknowledge

ACK

Data Structure	ASCII	ACK	positive acknowledge
	hex.	06	
	dec.	6	

Description	By sending the positive acknowledge code ACK (printer \rightarrow host) it is possible to transmit a data block to the printer and thus transfer it into the printer's line buffer.
--------------------	---



This code concerns only serial data transfer with ACK/NAK protocol.
For a detailed description see the documentation which comes with your printer.

Negative Acknowledge

NAK

Data Structure	ASCII hex. dec.	NAK 15 21	negative acknowledge
-----------------------	-----------------------	-----------------	----------------------

Description	By sending the negative acknowledge code NAK a parity error (character with the wrong parity) is indicated in the data block to be transmitted and then the data block is deleted.
--------------------	--



This code concerns only serial data transfer with ACK/NAK protocol.
For a detailed description see the documentation which comes with your printer.

Clear Print Buffer

CAN

Data Structure	ASCII hex. dec.	CAN 18 24	clear print buffer
-----------------------	-----------------------	-----------------	--------------------

Description	When the printer receives this code, the print buffer is completely cleared.
--------------------	--



This code only clears the contents of the print buffer. It does not affect any control codes which have previously been sent to the printer.

Delete**DEL**

Data Structure ASCII DEL [A] delete
 hex. 7F
 dec. 127

Description With this code the line buffer is cleared.

Acoustic Alarm**BEL**

Data Structure ASCII BEL [A] acoustic alarm
 hex. 07
 dec. 7

Description This code causes an acoustic alarm.

Start Character “Escape”

ESC

Data Structure	ASCII	ESC	[A] start character ESC
	hex.	1B	
	dec.	27	

Description	ESC is the start character for a subsequent program sequence (the string \$\$ can be used instead of ESC if option is selected in the printer setup).
--------------------	---

MTPL-Start Character “Control Sequence Introducer”

Data Structure	ASCII	CSI	[A] MTPL-start character CSI
	hex.	9B	
	dec.	155	

Description	MTPL-start character for a subsequent program sequence.
--------------------	---



Do not use “CSI” in any other printer command language than MTPL. Use instead “ESC [” if using other emulations.

Appendix A

Summary of Possible Codes

Sorted by Sequences

Function	Sequence	Page
ACK	control code ACK (Positive Acknowledge)	95
BEL	acoustic alarm	97
BS	control code BS (Backspace)	61
CAN	control code CAN (Cancel)	96
CR	control code CR (Carriage Return)	61
CSI	MTPL-start character for program sequence	98
CSI % 3 n1 ; n2 ; DATA	graphics 60 dpi	65
CSI % 4 n1 ; n2 ; DATA	graphics 120 dpi	65
CSI % 5 n1 ; n2 ; DATA	graphics 80 dpi	65
CSI % 6 n1 ; n2 ; DATA	graphics 240 dpi	65
CSI % 7 n1 ; n2 ; DATA	graphics 240 dpi	65
CSI % 8 n1 ; n2 ; DATA	graphics 72 dpi	65
CSI % 9 n1 ; n2 ; DATA	graphics 90 dpi	65
CSI : y	right justification and centering OFF	14
CSI = z	emphasized mode ON	35
CSI > z	emphasized mode ON	35
CSI ? 1 ~	MTPL command set	80
CSI ? 10 ~	end of command interpretations	80
CSI ? 11 ~	start of Barcode interpretation	80
CSI ? 2 ~	MTPL + IBM-Graphics-Printer command set	80
CSI ? 3 ~	MTPL + IBM-Proprietary XL command set	80
CSI ? 4 ~	MTPL + IBM-Proprietary XL 24e command set	80
CSI ? 5 ~	MTPL + EPSON FX command set	80
CSI ? 50 I	size of character set (2 character sets)	88
CSI ? 50 h	size of character set (1 character set)	88
CSI ? 51 h	proportional spacing (Draft) off	89
CSI ? 51 l	proportional spacing (Draft) on	89
CSI ? 52 h	font selection for NLQ/LQ	89
CSI ? 52 l	font selection	89
CSI ? 53 h	print code area expansion on	90
CSI ? 53 l	print code area expansion off	90
CSI ? 6 ~	MTPL + EPSON LQ command set	80
CSI ? 7 ~	MTPL + NEC P60/70 command set	80
CSI 0 + y	direct setting of the print head distance (default value)	70
CSI 0 + z	automatic gap adjustment OFF	70

Sequence	Function	Page
CSI 0 c	request for printer identification	91
CSI 0 g	clear horizontal tab stop at current position	46
CSI 0 m	clear all selected fonts	33
CSI 0 m	reset color	72
CSI 0 n	device status report: "Ready, no malfunction"	92
CSI 0 n1 ; n2 {	cut sheet paper	76
CSI 0 SP I	size unit Decipoints	8
CSI 0 SP K	horizontal character spacing 10 cpi	18
CSI 0 SP L	vertical spacing 6 lpi	24
CSI 0 SP q	load default menu	69
CSI 0 SP X	high print quality	31
CSI 0 w	horizontal spacing 5 cpi	16
CSI 0 y	draft print quality (DPQ)	31
CSI 0 z	superscript ON	27
CSI 1 + z	automatic gap adjustment ON	70
CSI 1 g	clear all vertical tab stops	52
CSI 1 m	bold or increased intensity	72
CSI 1 n	device status report: "Busy, no malfunction"	92
CSI 1 SP I	size unit Millimeters	8
CSI 1 SP K	horizontal character spacing 6 cpi	18
CSI 1 SP L	vertical spacing 4 lpi	24
CSI 1 SP q	load menu No. 1	69
CSI 1 SP X	medium print quality	31
CSI 1 w	horizontal spacing 6 cpi	16
CSI 1 y	near letter quality (NLQ)	31
CSI 1 z	subscript ON	27
CSI 10 m	font 0 (DPQ)	33
CSI 10 y	right justification and centering OFF	14
CSI 10 z	mikroscript ON	27
CSI 11 I	turn OFF positioning unit mode	7
CSI 11 h	turn ON positioning unit mode	7
CSI 11 m	font 1	33
CSI 11 w	horizontal spacing 20 cpi	16
CSI 11 y	fast draft print quality	31
CSI 12 m	font 2	33
CSI 12 w	horizontal spacing 10 cpi	16
CSI 12 y	letter print quality (LQ)	31

Sequence	Function	Page
CSI 12 z	double height ON (upper half)	29
CSI 13 m	font 3	33
CSI 13 y	high resolution print quality	31
CSI 13 z	double height ON (lower half)	29
CSI 14 m	font 4	33
CSI 15 m	font 5	33
CSI 16 m	font 6	33
CSI 17 m	font 7	33
CSI 18 m	font 8	33
CSI 19 m	font 9	33
CSI 2 g	clear all horizontal tab stops at current line	46
CSI 2 J	eject form	76
CSI 2 m	change color	72
CSI 2 SP I	size unit Decipoints	8
CSI 2 SP K	horizontal character spacing 15 cpi	18
CSI 2 SP L	vertical spacing 3 lpi	24
CSI 2 SP q	load menu No. 2	69
CSI 2 SP X	low print quality	31
CSI 2 w	horizontal spacing 7,5 cpi	16
CSI 2 y	proportional mode ON	37
CSI 2 z	double height OFF	29
CSI 2 z	super-/sub- and microscript OFF	27
CSI 21 m	double underline mode	39
CSI 21 n ₁ ; n ₂ {	bin 1 (front)	76
CSI 22 m	normal color or normal intensity	72
CSI 22 n ₁ ; n ₂ {	bin 2 (rear)	76
CSI 23 m	italic mode OFF	36
CSI 23 n ₁ ; n ₂ {	bin 3 (option)	76
CSI 24 m	underline mode OFF	39
CSI 26 m	proportional mode ON	37
CSI 3 g	clear all horizontal tab stops	46
CSI 3 m	italic mode ON	36
CSI 3 n	device status report: "Some malfunction detected"	92
CSI 3 SP I	size unit Decididots	8
CSI 3 SP K	horizontal character spacing 6 cpi	18
CSI 3 SP L	vertical spacing 12 lpi	24
CSI 3 SP q	load menu No. 3	69

Sequence	Function	Page
CSI 3 w	horizontal spacing 8,6 cpi	16
CSI 3 z	line density 6 lpi	25
CSI 30 m	color black	72
CSI 31 m	color red	72
CSI 31 n ₁ ; n ₂ {	output paper to stacker 1 (sorter)	76
CSI 32 m	color green	72
CSI 33 m	color yellow	72
CSI 34 m	color blue	72
CSI 35 m	color magenta red	72
CSI 36 m	color cyan-blue	72
CSI 37 m	color white	72
CSI 39 m	default color black	72
CSI 4 g	clear all vertical tab stops	52
CSI 4 m	underline mode ON	39
CSI 4 SP I	size unit Mils	8
CSI 4 SP L	vertical spacing 8 lpi	24
CSI 4 SP q	load menu No. 4	69
CSI 4 w	horizontal spacing 10 cpi	16
CSI 4 y	NLQ at 10 cpi	31
CSI 4 z	line density 8 lpi	25
CSI 5 n	request for device status report	92
CSI 5 n ₁ ; n ₂ {	fanfold paper	76
CSI 5 SP I	Basic Measuring Unit BMU	8
CSI 5 w	horizontal spacing 12 cpi	16
CSI 5 y	NLQ at 12 cpi	31
CSI 5 z	graphics normal	65
CSI 50 m	proportional mode OFF	37
CSI 50 n ₁ ; n ₂ {	move paper to normal print position	76
CSI 51 n ₁ ; n ₂ {	move paper to tear-off position	76
CSI 52 n ₁ ; n ₂ {	move paper to view position	76
CSI 53 m	overline mode ON	40
CSI 55 m	overline mode OFF	40
CSI 6 ~	reset to initial state	79
CSI 6 SP I	size unit Micrometers	8
CSI 6 w	horizontal spacing 15 cpi	16
CSI 6 z	graphics invers	65
CSI 7 SP I	size unit Pixels	8

Sequence	Function	Page
CSI 7 w	horizontal spacing 17,1 cpi	16
CSI 7 y	proportional mode OFF	37
CSI 7 z	set bit 8 = unchanged	74
CSI 8 w	double strike OFF	41
CSI 8 y	right justification ON	14
CSI 8 z	set bit 8 = 0	74
CSI 9 SP L	vertical spacing 2 lpi	24
CSI 9 w	double strike ON	41
CSI 9 y	centering ON	14
CSI 9 z	set bit 8 = 1	74
CSI n '	horizontal position absolute	54
CSI n + y	direct setting of the print head distance (in n -steps)	70
CSI n a	horizontal position relative	55
CSI n d	vertical position absolute	57
CSI n e	vertical position relative	58
CSI n j	horizontal position backward	56
CSI n k	vertical position backward	59
CSI n p	Horizontal Motion Index	22
CSI n q	horizontal step	23
CSI n SP \	additional character spacing	20
CSI n SP C	graphic size selection	42
CSI n SP f	reduced character spacing	21
CSI n SP g	character spacing	19
CSI n SP h	line spacing	26
CSI n SP U	line home	13
CSI n SP V	line limit	13
CSI n t	form lenght in lines	5
CSI n v	vertical tab stop	52
CSI n1 ; n2 SP B	graphic size modification	42
CSI n1; n2 f	horizontal- and vertical position absolute	60
CSI n1 ; n2 r	top and bottom margin	9
CSI n1 ; n2 s	left and right margin	11
CSI n1 ; n2 SP D	select font	43
CSI n1 ; n2 SP G	spacing increment	15
CSI n1 u	set horizontal tab stop	46
CSI Pn ... SP r	print transparent characters	90
CSI Pn + w	shared interface	71
CSI Ps1 Ps2 Ps3 Pn4 Pn5 + v	paper handling	71

Sequence	Function	Page
DEL	control code DEL (Delete)	97
ENQ	control code ENQ (Enquiry for Status)	93
ESC	MTPL-start character for program sequence	98
ESC (F	designate character set G0	83
ESC) F	designate character set G1	83
ESC * F	designate character set G2	83
ESC + F	designate character set G3	83
ESC |	LS3R: Activation of G3 for codes A1 - FE	81
ESC }	LS2R: Activation of G2 for codes A1 - FE	81
ESC ~	LS1R: Activation of G1 for codes A1 - FE	81
ESC c	reset to initial state	79
ESC H	set horizontal tab stop	46
ESC n	LS2: Activation of G2 for codes 21 - 7E	81
ESC o	LS2: Activation of G3 for codes 21 - 7E	81
ETX	control code ETX (End of Text Block)	95
FF	control code FF (Form Feed)	62
HT	control code HT (horizontal step)	45
HTS	control code HTS	45
IND	control code IND (Vertical Index)	51
LF	control code LF (Line Feed)	49
NAK	control code NAK (Negative Acknowledge)	95
NEL	control code NEL (Next Line)	64
NUL	control code NUL (fill character)	94
PLD	control code PLD (Partial Line Down)	63
PLU	control code PLU (Partial Line Up)	63
RI	control code RI (Reverse Index)	64
SI	single shift 3 (SS3)	86
SO	single shift 2 (SS2)	86
STX	control code STX (Start of Text Block)	94
VT	control code VT (Vertical Tab Stop)	50
VTS	control code VTS	51

Sorted by Functions

Function	Sequence	Page
acoustic alarm	BEL	97
additional character spacing	CSI n SP \	20
automatic gap adjustment OFF	CSI 0 + z	70
automatic gap adjustment ON	CSI 1 + z	70
Basic Measuring Unit BMU	CSI 5 SP I	8
bin 1 (front)	CSI 21 n ₁ ; n ₂ {	76
bin 2 (rear)	CSI 22 n ₁ ; n ₂ {	76
bin 3 (option)	CSI 23 n ₁ ; n ₂ {	76
bold or increased intensity	CSI 1 m	72
centering ON	CSI 9 y	14
change color	CSI 2 m	72
character spacing	CSI n SP g	19
clear all horizontal tab stops	CSI 3 g	46
clear all horizontal tab stops at current line	CSI 2 g	46
clear all selected fonts	CSI 0 m	33
clear all vertical tab stops	CSI 1 g	52
clear all vertical tab stops	CSI 4 g	52
clear horizontal tab stop at current position	CSI 0 g	46
color black	CSI 30 m	72
color blue	CSI 34 m	72
color cyan-blue	CSI 36 m	72
color green	CSI 32 m	72
color magenta red	CSI 35 m	72
color red	CSI 31 m	72
color white	CSI 37 m	72
color yellow	CSI 33 m	72
control code ACK (Positive Acknowledge)	ACK	95
control code BS (Backspace)	BS	61
control code CAN (Cancel)	CAN	96
control code CR (Carriage Return)	CR	61
control code DEL (Delete)	DEL	97
control code ENQ (Enquiry for Status)	ENQ	93
control code ETX (End of Text Block)	ETX	95
control code FF (Form Feed)	FF	62
control code HT (horizontal step)	HT	45

Function	Sequence	Page
control code HTS	HTS	45
control code IND (Vertical Index)	IND	51
control code LF (Line Feed)	LF	49
control code NAK (Negative Acknowledge)	NAK	95
control code NEL (Next Line)	NEL	64
control code NUL (fill character)	NUL	94
control code PLD (Partial Line Down)	PLD	63
control code PLU (Partial Line Up)	PLU	63
control code RI (Reverse Index)	RI	64
control code STX (Start of Text Block)	STX	94
control code VT (Vertical Tab Stop)	VT	50
control code VTS	VTS	51
cut sheet paper	CSI 0 n1 ; n2 {	76
default color black	CSI 39 m	72
designate character set G0	ESC (F	83
designate character set G1	ESC) F	83
designate character set G2	ESC * F	83
designate character set G3	ESC + F	83
device status report: "Busy, no malfunction"	CSI 1 n	92
device status report: "Ready, no malfunction"	CSI 0 n	92
device status report: "Some malfunction detected"	CSI 3 n	92
direct setting of the print head distance (default value)	CSI 0 + y	70
direct setting of the print head distance (in n -steps)	CSI n + y	70
double height OFF	CSI 2 z	29
double height ON (lower half)	CSI 13 z	29
double height ON (upper half)	CSI 12 z	29
double strike OFF	CSI 8 w	41
double strike ON	CSI 9 w	41
double underline mode	CSI 21 m	39
draft print quality (DPQ)	CSI 0 y	31
eject form	CSI 2 J	76
emphasized mode ON	CSI = z	35
emphasized mode ON	CSI > z	35
end of command interpretations	CSI ? 10 ~	80
fanfold paper	CSI 5 n1 ; n2 {	76
fast draft print quality	CSI 11 y	31
font 0 (DPQ)	CSI 10 m	33

Function	Sequence	Page
font 1	CSI 11 m	33
font 2	CSI 12 m	33
font 3	CSI 13 m	33
font 4	CSI 14 m	33
font 5	CSI 15 m	33
font 6	CSI 16 m	33
font 7	CSI 17 m	33
font 8	CSI 18 m	33
font 9	CSI 19 m	33
font selection for NLQ/LQ	CSI ? 52 h	89
font selection	CSI ? 52 I	89
form lenght in lines	CSI n t	5
graphic size modification	CSI n ₁ ; n ₂ SP B	42
graphic size selection	CSI n SP C	42
graphics 120 dpi	CSI % 4 n ₁ ; n ₂ ; DATA	65
graphics 240 dpi	CSI % 6 n ₁ ; n ₂ ; DATA	65
graphics 240 dpi	CSI % 7 n ₁ ; n ₂ ; DATA	65
graphics 60 dpi	CSI % 3 n ₁ ; n ₂ ; DATA	65
graphics 72 dpi	CSI % 8 n ₁ ; n ₂ ; DATA	65
graphics 80 dpi	CSI % 5 n ₁ ; n ₂ ; DATA	65
graphics 90 dpi	CSI % 9 n ₁ ; n ₂ ; DATA	65
graphics invers	CSI 6 z	65
graphics normal	CSI 5 z	65
high print quality	CSI 0 SP X	31
high resolution print quality	CSI 13 y	31
horizontal character spacing 10 cpi	CSI 0 SP K	18
horizontal character spacing 15 cpi	CSI 2 SP K	18
horizontal character spacing 6 cpi	CSI 1 SP K	18
horizontal character spacing 6 cpi	CSI 3 SP K	18
Horizontal Motion Index	CSI n p	22
horizontal position absolute	CSI n'	54
horizontal position backward	CSI n j	56
horizontal position relative	CSI n a	55
horizontal spacing 10 cpi	CSI 12 w	16
horizontal spacing 10 cpi	CSI 4 w	16
horizontal spacing 12 cpi	CSI 5 w	16
horizontal spacing 15 cpi	CSI 6 w	16

Function	Sequence	Page
horizontal spacing 17,1 cpi	CSI 7 w	16
horizontal spacing 20 cpi	CSI 11 w	16
horizontal spacing 5 cpi	CSI 0 w	16
horizontal spacing 6 cpi	CSI 1 w	16
horizontal spacing 7,5 cpi	CSI 2 w	16
horizontal spacing 8,6 cpi	CSI 3 w	16
horizontal step	CSI n q	23
horizontal- and vertical position absolute	CSI n ₁ ; n ₂ f	60
italic mode OFF	CSI 23 m	36
italic mode ON	CSI 3 m	36
left and right margin	CSI n ₁ ; n ₂ s	11
letter print quality (LQ)	CSI 12 y	31
line density 6 lpi	CSI 3 z	25
line density 8 lpi	CSI 4 z	25
line home	CSI n SP U	13
line limit	CSI n SP V	13
line spacing	CSI n SP h	26
load default menu	CSI 0 SP q	69
load menu No. 1	CSI 1 SP q	69
load menu No. 2	CSI 2 SP q	69
load menu No. 3	CSI 3 SP q	69
load menu No. 4	CSI 4 SP q	69
low print quality	CSI 2 SP X	31
LS1R: Activation of G1 for codes A1 - FE	ESC ~	81
LS2: Activation of G2 for codes 21 - 7E	ESC n	81
LS2: Activation of G3 for codes 21 - 7E	ESC o	81
LS2R: Activation of G2 for codes A1 - FE	ESC }	81
LS3R: Activation of G3 for codes A1 - FE	ESC | . . . . .	81
medium print quality	CSI 1 SP X	31
mikroscript ON	CSI 10 z	27
move paper to normal print position	CSI 50 n ₁ ; n ₂ {	76
move paper to tear-off position	CSI 51 n ₁ ; n ₂ {	76
move paper to view position	CSI 52 n ₁ ; n ₂ {	76
MTPL + EPSON FX command set	CSI ? 5 ~	80
MTPL + EPSON LQ command set	CSI ? 6 ~	80
MTPL + IBM-Graphics-Printer command set	CSI ? 2 ~	80
MTPL + IBM-Proprinter XL 24e command set	CSI ? 4 ~	80

Function	Sequence	Page
MTPL + IBM-Proprinter XL command set	CSI ? 3 ~	80
MTPL + NEC P60/70 command set	CSI ? 7 ~	80
MTPL command set	CSI ? 1 ~	80
MTPL-start character for program sequence	CSI	98
MTPL-start character for program sequence near letter quality (NLQ)	ESC	98
NLQ at 10 cpi	CSI 1 y	31
NLQ at 12 cpi	CSI 4 y	31
normal color or normal intensity	CSI 5 y	31
output paper to stacker 1 (sorter)	CSI 22 m	72
overline mode OFF	CSI 31 n ₁ ; n ₂ {	76
overline mode ON	CSI 55 m	40
paper handling	CSI 53 m	40
print code area expansion ON	CSI Ps1 Ps2 Ps3 Ps4 Ps5 + v	71
print code area expansion OFF	CSI ? 53 h	90
print transparent characters	CSI ? 53 l	90
proportional mode OFF	CSI Pn ... SP r	90
proportional mode OFF	CSI 50 m	37
proportional mode ON	CSI 7 y	37
proportional mode ON	CSI 2 y	37
proportional spacing (Draft) off	CSI 26 m	37
proportional spacing (Draft) on	CSI ? 51 h	89
reduced character spacing	CSI ? 51 l	89
request for device status report	CSI n SP f	21
request for printer identification	CSI 5 n	92
reset color	CSI 0 c	91
reset to initial state	CSI 0 m	72
reset to initial state	CSI 6 ~	79
right justification and centering OFF	ESC c	79
right justification and centering OFF	CSI : y	14
right justification ON	CSI 10 y	14
select font	CSI 8 y	14
set bit 8 = 0	CSI n ₁ ; n ₂ SP D	43
set bit 8 = 1	CSI 8 z	74
set bit 8 = unchanged	CSI 9 z	74
set horizontal tab stop	CSI 7 z	74
set horizontal tab stop	CSI n1 u	46
	ESC H	46

Function	Sequence	Page
shared interface	CSI Pn + w	71
single shift 2 (SS2)	SO	86
single shift 3 (SS3)	SI	86
size of character set (1 character set)	CSI ? 50 h	88
size of character set (2 character sets)	CSI ? 50 I	88
size unit Decididots	CSI 3 SP I	8
size unit Decipoints	CSI 0 SP I	8
size unit Decipoints	CSI 2 SP I	8
size unit Micrometers	CSI 6 SP I	8
size unit Millimeters	CSI 1 SP I	8
size unit Mils	CSI 4 SP I	8
size unit Pixels	CSI 7 SP I	8
spacing increment	CSI n ₁ ; n ₂ SP G	15
start of Barcode interpretation	CSI ? 11 ~	80
subscript ON	CSI 1 z	27
super-/sub- and microscript OFF	CSI 2 z	27
superscript ON	CSI 0 z	27
top and bottom margin	CSI n ₁ ; n ₂ r	9
turn OFF positioning unit mode	CSI 11 I	7
turn ON positioning unit mode	CSI 11 h	7
underline mode OFF	CSI 24 m	39
underline mode ON	CSI 4 m	39
vertical position absolute	CSI n d	57
vertical position backward	CSI n k	59
vertical position relative	CSI n e	58
vertical spacing 12 lpi	CSI 3 SP L	24
vertical spacing 2 lpi	CSI 9 SP L	24
vertical spacing 3 lpi	CSI 2 SP L	24
vertical spacing 4 lpi	CSI 1 SP L	24
vertical spacing 6 lpi	CSI 0 SP L	24
vertical spacing 8 lpi	CSI 4 SP L	24
vertical tab stop	CSI n v	52

Appendix B

Character Sets

Standard Character Set

hex dec	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
0	NUL 0		SP 16	0 32	48 64	P 80		p 96		NUL 112	á 128			í 144	160 176	é 192	í 208 224 240
1		DC1 1	! 17	1 33	A 49	Q 65	a 81	q 97			í 129	145 161		í 177	193 209	í 225 241	
2	STX 2	DC2 18	" 34	2 50	B 66	R 82	b 98	r 114			ó 130	146 162		ó 178	T 194 210	T 226 242	
3	ETX 3	DC3 19		3 35	C 51	S 67	c 83	s 99				131 147	163 179		í 195	L 211 227 243	
4		DC4 20		4 36	D 52	T 68	d 84	t 100		IND 116		132 148	164 180		- 196	Σ 212 228 244	
5	ENQ 5	NAK 21	% 37	5 53	E 69	U 85	e 101	ú 117		NEL 133		149 165		ñ 181	+ 197	σ 213 229 245	
6	ACK 6		& 22	6 38	F 54	V 70	f 86	v 102				150 166		‡ 182	ƒ 298	μ 214 230 246	
7	BEL 7		' 23	7 39	G 55	W 71	g 87	w 103		BEL 119		151 167		† 183	| 199	τ 215 231 247	
8	BS 8	CAN 24	(40	8 56	H 72	X 88	h 104	x 120		HTS 136		152 168		‡ 184	‡ 200	Φ 216 232 248	
9	HT 9		) 25	9 41	I 57	Y 73	i 89	y 105		HT 121		153 169		‡ 185	‡ 201	Θ 217 233 249
A	LF 10		* 26	:	J 58	Z 74	j 90	z 106		VTS 122		154 170		‡ 186	‡ 202	Ω 218 234 250	
B	VT 11	ESC 27	; 43		K 59		k 91		PLD 107	CSI 123		½ 139		‡ 187	‡ 203	δ 219 235 251	
C	FF 12		, 44	< 60	L 76		l 92		PLU 108		¼ 140		‡ 188	‡ 204	∞ 220 236 252		
D	CR 13		- 45	= 61	M 77		m 93		RI 109		i 141		‡ 173	= 189	ϕ 205 221 237 253		
E	SO 14		. 46	> 62	N 78		n 94		SO 110		« 142		‡ 174	» 190	‡ 206	ε 222 238 254	
F			/ 47	? 63	O 79		o 95		DEL 111	SI 127		» 143		‡ 175	‡ 191	▀ 207 223 239 255	

For the contents of the shaded areas, see table at page B-3.

B-2 Character Sets

International Substitution Table - normal font

	dec	35	36	64	91	92	93	94	96	123	124	125	126
	hex	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
USA	#	\$	@	[	\	\]	^	`	{	|	}	~
Great Britain	£	\$	@	[	\	\]	^	`	{	|	}	—
Sweden	#	¤	É	Å	Ö	Ä	Ü	é	ä	ö	å	ü	
Germany	#	\$	§	ß	Ø	Ü	^	`	ä	ö	ü	ß	
Portugal	#	\$	§	Ã	Ç	Ó	^	`	ã	ç	õ	º	
France	£	\$	à	°	ç	ſ	^	`	é	ù	è	„	
Italy	£	\$	§	°	ç	é	^	ù	à	ò	è	í	
Spain	£	\$	§	í	Ñ	ò	^	`	ó	ñ	ç	~	
Norway	#	\$	@	Æ	Ø	À	^	`	æ	ø	å	—	



The contents of the columns 8 and 9 depend on the settings in the printer's menu.

Appendix C

Additional Technical Description

**Programmer's
Application Manuals**

Programmer's Application Manual Epson
Tally Part No.: 379 302

Programmer's Application Manual IBM
Tally Part No.: 379 306

Programmer's Application Manual Manual Barcode
Tally Part No.: 379 300

Folder

Folder for Programmer's Application Manual Manuals
Tally Part No.: 389 865

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