PHILIPS

80 COLUMN LETTER QUALITY MATRIX PRINTER

NMS 1431/00

MSX™

INSTRUCTION MANUAL
MANUEL D'INSTRUCTIONS
INSTRUKTIONSHANDBUCH
INSTRUKTIEBOEK
MANUALE D'INSTRUZIONE
MANUAL DE INSTRUCCIONES

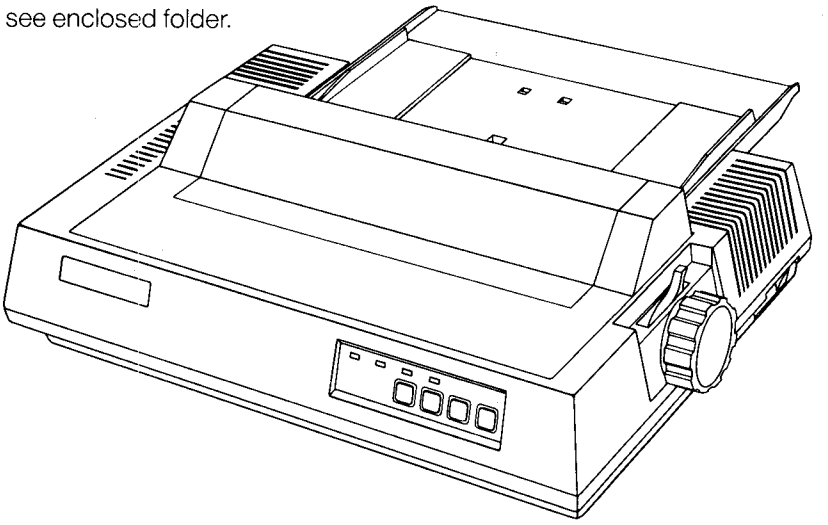
New Media Systems

CONTENTS

Control panel and switches 1
Installing and using your printer 2
Installing and removing the ribbon cassette 2
Paper loading: Single sheets 2
Fan-fold paper 3
Adjusting the print head 3
Test functions:
Printer self-testing 4
Hexadecimal dump 4
Margin setting 4
Dip switch setting 5
Control codes, summary 5
Technical specifications 7
Character category specifications 7
Character set tables 7
Parallel interface specification 8
Cautions for use 8
Troubleshooting 8
Appendix A 60
Appendix B 73
Appendix C 74
Appendix D 75

LETTER-QUALITY MATRIX PRINTER

For illustrations see enclosed folder.



CONTROL PANEL AND SWITCHES ①

A. **POWER ON INDICATOR**
The green indicator lights up when the power of the printer is switched on.

B. **PAPER OUT INDICATOR**
The red indicator lights up and an audible signal sounds when the printer detects that no paper has been inserted. The printer automatically enters the OFF-LINE state. To continue insert paper and press the ON-LINE key.

C. **ON-LINE KEY AND INDICATOR**
- When the green indicator lights up the printer is in the ON-LINE state.
- Press the ON-LINE button and the printer is in the OFF-LINE state.
- Press again to put printer in ON-LINE state again.

D. **L.Q. KEY AND INDICATOR** (Letter Quality)
(Can be activated only in the OFF-LINE state.)
- When the green indicator lights up the printer is in letter quality mode.
- Press the LQ-button for standard mode.
- Press again for letter quality mode.

E. **F.F. KEY** (Form Feed)
(Can be activated only in the OFF-LINE state.) When using single sheets, a sheet is automatically moved to the end of the page when you press the FF-button.
(The red PAPER OUT indicator will light up.)

F. **L.F. KEY** (Line Feed)
(Can be activated only in the OFF-LINE state.) Every time this key is pressed the paper is transported one line. If you keep the L.F. key depressed the paper will continue to be transported until you release the key again.

Note: These same keys are used for margin setting, as indicated on the control panel, immediately underneath the keys. For further details, see chapter 'Margin Setting' on page 4.

DIP SWITCHES
The dip switches are located at the back of the machine.
(See page 5 for further details.)

INSTALLING AND USING YOUR PRINTER

Make sure that both your computer and printer ② are turned off before connecting the printer!

Use the special interface cable ③, provided with your printer, to connect it to the printer interface of your computer and fasten the locking-clips.

Read these instructions carefully and follow them step by step when using your printer for the first time. Subjects like paper loading and installation of the ribbon cassette are particularly important. The same applies to the chapters on cautions for use and troubleshooting.

When writing your own programs in MSX-BASIC, including the use of a printer, the following statements apply:

PRINT To print or write data into a file.
LPRINT To print data on paper via the printer.
LLIST To print a program or part of a program on paper.
OPEN To open a file and allocate a buffer.
CLOSE To close a file and release the associated memory buffer.
SCREEN To declare a printer MSX or non-MSX.
LPOS Gives an indication of the print position in a buffer.

See your MSX-BASIC manuals for further details.

INSTALLING AND REMOVING THE RIBBON CASSETTE ④

Note: You will find a ribbon cassette packed with your printer. Additional cassettes are available through your dealer. (Type number SBC 436.)

Installation

a. Make sure that your printer is turned off first.
b. Remove the printer cover ⑤.
c. Remove the tractor unit ⑥.
d. Move the print head ⑦ to the home position (to the extreme left).
e. Turn the ribbon feed knob ⑧ in the direction of the arrow to remove possible slack from the ribbon.
f. Insert the ribbon between the ribbon mask ⑨ (1) and the print head ⑨ (2) and position the cassette so that the feed shaft ⑩ is inserted into the hole under the ribbon feed knob.
g. Press both ends of the cassette down firmly.
h. Tighten the ribbon by turning the ribbon feed knob in the direction of the arrow and make sure the ribbon is still properly positioned in front of the print head.
i. Close the printer cover again.

Removal

Firmly hold the fin on top of the cassette ⑪ and pull it straight up.

PAPER LOADING

Single sheets

a. Tractor unit has to be removed for single sheet operation.
b. Mount paper shelf ⑫ by first placing it onto the special supports on the printer in upright position.
c. Tilt up the paper shelf. Fold out the support ⑬ behind the paper shelf and place its end into the notch in the printer.
d. Slide the left paper guide ⑭ into the proper posoition for your left margin.

e. Set the right paper guide ⑮ simply by sliding it to the left or the right, as required.
f. Put the power switch ③ on. The green POWER ON indicator will light up.
g. Place a sheet of paper on the paper shelf, between the paper guides.
h. Pull the paper loading handle ⑯ towards you and the paper will automatically be transported to the proper starting position. (The printing will then start 1 inch from the top of the sheet.)
i. Push the loading handle to the rear again and the paper bail ⑰ will set.
j. Press the ON-LINE key and your printer is ready for action.

Notes

1. If you want to shift a sheet of paper after it has been loaded, you can easily do so after completing the loading process as described above, since the paper is only held loosely by the friction mechanism. Make sure that the paper remains straight in the printer.
2. If the left-hand paper guide has been set to its leftmost position, the left-hand margin of the printed sheet will be approx. 1 inch.
3. The two rollers of the paper bail should never be set to the outer edges of the paper but approx. one third of the width from the edges ⑱.

Mounting the tractor unit ⑲ and inserting fan-fold paper.

a. See to it that the power is turned off.
b. Remove the printer cover and the paper shelf.
c. Pull the paper loading handle ⑳ towards you.

Now you can install the paper feed tractor onto the platen:

d. Insert the hooks on either side of the tractor unit into the openings at the front, on either side of the platen-unit ㉑.
e. Push the rear of the tractor unit down so the spring loaded hooks ㉒ click into position.
f. Open both tractor covers ㉓.
g. Insert the paper into the printer loosely, as far as it will go ㉔.
h. Turn your printer on.
i. First push the paper loading handle to the rear, then pull it forward again and the paper will be transported automatically until it appears above the print head.
j. Leave the paper loading handle in its front position! Turn the paper knob clockwise to transport the paper another 10 cm (4 inches).
k. Then move the paper loading handle to its rear position.
l. Adjust the tractors to correspond exactly with the width of the paper you are using.
m. Carefully lay the paper over the tractors so the pins engage into the sprockets of the paper ㉕. Then close the tractor covers again.
n. Now mount the paper shelf again and put it in horizontal position ㉖. (Fold the support flat against the paper shelf.)
o. Put the printer cover back onto the printer.
p. Now transport the paper by turning the paper feed knob clockwise until the perforation of the second sheet appears above the print head.
q. Finally press the ON-LINE key and your printer is ready for action.

Note: Make sure that your printer is set to the proper paper length! (See DIP-switch setting, page 5.)

ADJUSTING THE PRINT HEAD ㉗

The print head can be adjusted with the print head adjustment lever. You will find it inside the printer on the right-hand side.

When shipped from the factory, the lever is set at to a position meant for straight printing without copy. If you want to print one or more copies, you can increase the force by moving the lever ㉘ towards you.

When printing single copies it is recommended to reset the lever to its original position to avoid unnecessary wear and tear on your printer.

TEST FUNCTIONS

Printer self-testing
The printer self-testing facility offers you the opportunity to check the main functions of the printer. There are two possibilities:

1. **Testing Letter Quality printing**
   - First insert a sheet of paper into the printer.
   - Then turn the printer off.
   - Turn the printer on again while you press the L.Q.-key.
     Keep the L.Q.-key depressed until the printer starts its self-test in Letter Quality.
   - You can stop the printing by switching the printer off again.

2. **Testing Draft Quality printing.**
   Follow the same procedure as described above. The only difference being that you press the L.F.-key instead of the L.Q.-key.

Hexadecimal dump
The hexadecimal dump facility is meant only to trace possible errors in your MSX-BASIC programs by providing a hexadecimal print-out of your work.
- First turn the printer off.
- Turn it on again while keeping the F.F.-key depressed.
- Then use your MSX commands for a print-out.

MARGIN SETTING ①

The printer offers the possibility to set both a left-hand and right-hand margin.

You should **not** use it when working with a word processing program with margin setting included.

Setting the margins
The control panel of your printer indicates which keys to use to set the margins.
- The printer should be in the ON-LINE state first.
- Then press the MARGIN key (=ON-LINE key) and keep it depressed until the green indicator starts blinking.
- Press the → key(=L.F.-key) on the control panel to move the print head to the required position for the left margin.
  (You can use the ← key (=F.F.-key) to move the print head to the left.)
- Then press the SET key (=L.Q.-key) to set the margin.
- Next press the → key again to move the print head to the position where you want the right-hand margin.
- Then press the SET key (= L.Q.-key) again. Now both margins are set. The printer automatically returns to the ON-LINE state (the indicator stops blinking) and the normal function of the keys is restored.

Note:
When you switch the printer off, the margin setting is lost.

DIP SWITCH SETTING

The following functions can be selected by using the dip switches, located at the back of the printer ㉙. The dip switches are read after an initialization process. This is done either by putting the power switch on or by an ESC,@ command.

Page setting

SWITCH NO.		FUNCTION
1	2	
OFF	OFF	Page length is set to 12 inches.
OFF	ON	Page length is set to 8 inches.
ON	OFF	Page length is set to 11 inches.
ON	ON	Page length is set to 14 inches.

Italic character setting

Switch 3 ON	Italic characters.
Switch 3 OFF	Standard characters.

Character mode setting

SWITCH NO.		FUNCTION
4	5	
OFF	OFF	Pica mode (10 cpi)
OFF	ON	Elite mode (12 cpi)
ON	OFF	Condensed mode (17 cpi)
ON	ON	Proportional mode

<30>H code selection

Switch 6 ON	"Ø"
Switch 6 OFF	"0"

1 inch perforation skip

Switch 8 ON	Designated.
Switch 8 OFF	Not designated.

Note:
Switch 7 has no function.

CONTROL CODES

Summary
Notes: Some of the functions have priority over others, which means that there are limitations to the combinations that can be made. When a function, overriding another function, is cancelled the remaining function becomes valid again. No error warnings are given.

Print mode priorities are:
- Super/Subscript > Letter Quality > Double strike.
- Condensed > Letter Quality.
- Condensed > Bold print.

When the Super/Subscript and the italic functions are continuously designated, the latter input function is given priority. When one function is terminated the other becomes valid.

For examples see Appendix A.

	SYMBOL	CODE IN BASIC	FUNCTION
1	CR	CHR$(13)	Carriage return after printing.
2	LF	CHR$(10)	Carriage return and line feed after printing.
3	VT	CHR$(11)	Same as LF.
4	FF	CHR$(12)	Form feed after printing.
		The four commands above are print commands	
5	ESC,N	CHR$(27);"N"	10 cpi (pica) printing on.
6	ESC,E	CHR$(27);"E"	12 cpi (elite) printing on.
7	ESC,Q	CHR$(27);"Q"	17 cpi (condensed) printing on.
8	ESC,P	CHR$(27);"P"	Proportional printing on.
9	SO	CHR$(14)	Double width mode on.
10	SI	CHR$(15)	Double width mode off.
11	ESC,!	CHR$(27);"!"	Letter Quality printing on.
12	ESC,"	CHR$(27);CHR$(34)	Letter Quality printing off.
13	ESC,C,S	CHR$(27);"CS"	Superscript printing on.
14	ESC,C,s	CHR$(27);"Cs"	Superscript printing off.
15	ESC,C,U	CHR$(27);"CU"	Subscript printing on.
16	ESC,C,u	CHR$(27);"Cu"	Subscript printing off.
17	ESC,C,I	CHR$(27);"CI"	Italic printing on.
18	ESC,C,i	CHR$(27);"Ci"	Italic printing off.
19	ESC,C.B	CHR$(27);"CB"	Bold printing on.
20	ESC,C,b	CHR$(27);"Cb"	Bold printing off.
21	ESC,C,D	CHR$(27);"CD"	Double strike printing on.
22	ESC,C,d	CHR$(27);"Cd"	Double strike printing off.
23	HT	CHR$(9)	Move to next horizontal tab position.
24	ESC,(	CHR$(27);"("	Horizontal tab position setting.
25	ESC,)	CHR$(27);")"	Clears part of horizontal tabs.
26	ESC,2	CHR$(27);"2"	Clears all horizontal tabs.
27	ESC,O,"nnn"	CHR$(27);"Onnn"	Page length setting in line units.
28	ESC,O,I,"nn"	CHR$(27);"OInn"	Page length setting in inches.
29	ESC,O,S,"nn"	CHR$(27);"OSnn"	Perforation skip line setting.
30	ESC,O,S,00	CHR$(27);"OS00"	Perforation skip off.
31	ESC,/,"nnn"	CHR$(27);"/nnn"	Right margin setting.
32	ESC,L,"nnn"	CHR$(27);"Lnnn"	Left margin setting.
33	ESC,A	CHR$(27);"A"	Selects 1/6" line feed.
34	ESC,B	CHR$(27);"B"	Selects 1/9" line feed.
35	ESC,T,"nn"	CHR$(27);"Tnn"	Selects "nn"/144" line feed.
36	ESC,Z,"nn"	CHR$(27);"Znn"	Selects "nn"/216" line feed.
37	ESC,[	CHR$(27);"["	Selects uni-directional printing.
38	ESC,]	CHR$(27);"]"	Selects bi-directional printing.
39	ESC,p	CHR$(27);"p"	Paper-out detection on.
40	ESC,q	CHR$(27);"q"	Paper-out detection off.
41	ESC,CR	CHR$(27);CHR (13)	Moves print head to home position.
42	ESC,@	CHR$(27);"@"	Resets printer.
43	BEL	CHR$(7)	Sounds buzzer (0.3 sec).
44	CAN	CHR$(24)	Clears buffer.
45	ESC,G,"nnn"	CHR$(27);"Gnnn"	"nnn" dots/inch graphic printing density.
46	ESC,S	CHR$(27);"S"	Graphics printing dots/inch depending on print mode.
47	SOH	CHR$(1)	Code to precede special symbol code (See Appendix C).
48	ESC, X	CHR$(27);"X"	Underline printing on.
49	ESC, Y	CHR$(27);"Y"	Underline printing off.
50	BS	CHR$(8)	Back space (1 character).

Note:
"n" in the above symbols and BASIC codes corresponds with the numbers 0-9 in the ASCII code table.

TECHNICAL SPECIFICATIONS

Print method	9-pin impact matrix. Bi-directional, short line seeking.
Characters & Symbols	254 (including graphic symbols).
Graphic printing	8 categories: • 8 dots vertically • Horizontal density (dots/inch): 60, 72, 80, 90, 120, 136, and 240*. * Adjoining dots cannot be printed.
Print modes:	
Standard quality	Pica (10 cpi) Elite (12 cpi) Condensed (17 cpi) Proportional
Letter quality	Pica (10 cpi) Elite (12 cpi) Proportional

Mixing of the above modes within a single line is possible.
Printing of the present data is performed prior to mode change.

Additional possibilities	Bold Double strike Double width Superscript Subscript Italic
Paper transport	Friction feed Pin-feed
Line feed pitch	Minimum 1/216 inch
Line feed speed	6.7 lines/second (6 lines/inch)
Paper width	Minimum width: 4 inches Maximum width: 10 inches
Paper weight	50 to 80 g/m
Number of copies	Max. original + 2 copies, using paper with a combined thickness of max. 0.2 mm.
Ribbon	Single colour (black) in cassette. Number of impressions: approx 2,5 million (draft quality)
Operating temperature	5° to 35°C
Storage temperature	−30° to +60°C
Power supply	230 V AC (± 15%) 50 Hz (± 3%)
Power consumption	During operation: Approx. 80 W While idling : Approx. 15 W
Dimensions (WxHxD)	403 x 119 x 278 mm (without paper shelf)
Weight	4.8 kg

CHARACTER CATEGORY SPECIFICATIONS

See Appendix B

CHARACTER SET TABLES

See Appendix C

PARALLEL INTERFACE SPECIFICATION

See Appendix D

CAUTIONS FOR USE

- Only use a power supply voltage within the specified range.
- Do not touch the print head immediately after printing because it can get very hot during operation.
- Be careful that you do not twist the ribbon while installing it.
- Wait at least two seconds after turning the power off before turning it back on again. If you don't the initialization process may not be performed properly.
- Avoid direct sunlight, humidity and dust when using the printer.
- Do not perform printing when there is no ribbon and paper in your printer.
- Never install the tractor unit when you are using friction feed for cut sheet paper.
- When using continuous forms, the paper bail must be set to the platten side otherwise the paper may jam in the printer.

TROUBLESHOOTING

If your printer does not function properly, try and locate the cause, using the following checklist:

1. **The printer does not print and the POWER ON indicator does not light up.**
   There may be something wrong with the power supply.
   Check the power switch and the power cable connection.
2. **The printer does not print while the POWER ON indicator lights up.**
   First check whether the ribbon cassette has been installed properly. Try a printer self-test first. If the self-test works, check the connecting cable with the printer interface.
   If all that seems to be in order there may be something wrong with the computer program or the computer itself.
3. **The printer functions properly but the paper is not feeding through the way it should.**
   The paper is probably jammed in the printer.
   Remove the paper and insert it (or a new sheet) properly.
4. **The print is light or smeared.**
   - The print head adjustment is not correct. If so, set it properly according to the paper you are using.
   - The ribbon cassette has not been installed properly.
   - The ink ribbon is old and worn out.
     Replace the ribbon with a new one.
     (Type number SBC 436)

   You can use the printer self-test facility to check the quality of the ink ribbon.
5. **The PAPER OUT indicator blinks.**
   An error condition has been detected. Turn the power off and then back on again.

APPENDIX A

1 CR CHR$(13)

```
10 LPRINT "        PRINTER";
20 LPRINT CHR$(13);"NMS 1431"
30 LPRINT "        IMPRIMANTE";
40 LPRINT CHR$(13);"NMS 1431 "
```

```
NMS 1431 PRINTER
NMS 1431 IMPRIMANTE
```

2 LF CHR$(10)

```
10 LPRINT "LINE/LIGNE 1"
20 LPRINT CHR$(10);
30 LPRINT "LINE/LIGNE 3"
```

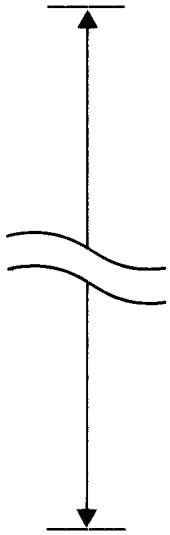
```
LINE/LIGNE 1

LINE/LIGNE 3
```

4 FF CHR$(12)

```
10 LPRINT "PAGE 1"
20 LPRINT CHR$(12);"PAGE 2"
```

```
PAGE 1
```



```
PAGE 2
```

5 [ESC][N] CHR$(27);"N"

6 [ESC][E] CHR$(27);"E"

7 [ESC][Q] CHR$(27);"Q"

```
10 LPRINT CHR$(27);"N"
20 LPRINT "1234567890 PICA"
30 LPRINT CHR$(27);"E"
40 LPRINT "123456789012 ELITE"
50 LPRINT CHR$(27);"Q"
60 LPRINT "12345678901234567 CONDENSED"
```

```
1234567890 PICA

123456789012 ELITE

12345678901234567 CONDENSED
```

9 [SO] CHR$(14)

10 [SI] CHR$(15)

```
10 LPRINT CHR$(14);
20 LPRINT "DOUBLE WIDTH/DOUBLE LARGEUR"
30 LPRINT CHR$(15);
40 LPRINT "NORMAL/NORMALEMENT"
```

```
DOUBLE WIDTH/DOUBLE LARGEUR
NORMAL/NORMALEMENT
```

11 | ESC | ! | CHR$(27);"!"

12 | ESC | " | CHR$(27);CHR$(34)

```
10 LPRINT CHR$(27);"!";
20 LPRINT "QUALITY/QUALITé"
30 LPRINT CHR$(27);CHR$(34);
40 LPRINT "QUALITY OUT/QUALITé TERMINéE"
```

QUALITY/QUALITé
QUALITY OUT/QUALITé TERMINéE

13 | ESC | CS | CHR$(27);"CS"

14 | ESC | Cs | CHR$(27);"Cs"

```
10 LPRINT "X+X";
20 LPRINT CHR$(27);"CS";
30 LPRINT "2";
40 LPRINT CHR$(27);"Cs";
50 LPRINT "=0"
```

$X+X^2=0$

15 | ESC | CU | CHR$(27);"CU"

16 | ESC | Cu | CHR$(27);"Cu"

```
10 LPRINT "H";
20 LPRINT CHR$(27);"CU";
30 LPRINT "2";
40 LPRINT CHR$(27);"Cu";
50 LPRINT "O"
```

H_2O

17 | ESC | CI | CHR$(27);"CI"

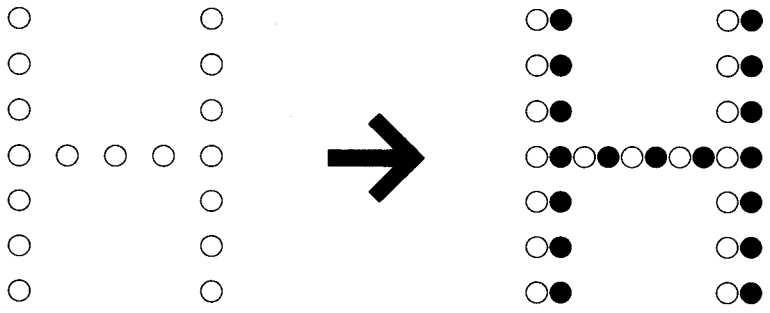
18 | ESC | Ci | CHR$(27);"Ci"

```
10 LPRINT CHR$(27);"CI";
20 LPRINT "ITALIC/MODE ITALIQUES"
30 LPRINT CHR$(27);"Ci";
40 LPRINT "NORMAL/NORMALEMENT"
```

ITALIC/MODE ITALIQUES
NORMAL/NORMALEMENT

19 | ESC | CB | CHR$(27);"CB"

20 | ESC | Cb | CHR$(27);"Cb"

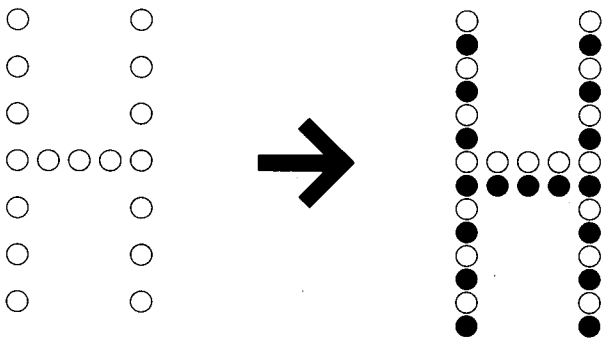


```
10 LPRINT CHR$(27);"CB";
20 LPRINT "BOLD/CARACTERES GRAS"
30 LPRINT CHR$(27);"Cb";
40 LPRINT "NORMAL/NORMALEMENT";
```

BOLD/CARACTERES GRAS
NORMAL/NORMALEMENT

21 | ESC | CD | CHR$(27);"CD"

22 | ESC | Cd | CHR$(27);"Cd"



```
10 LPRINT CHR$(27);"CD";
20 LPRINT "DOUBLE STRIKE/DOUBLE SOULIGNé"
30 LPRINT CHR$(27);"Cd";
40 LPRINT "NORMAL/NORMALEMENT";
```

```
DOUBLE STRIKE/DOUBLE SOULIGNé
NORMAL/NORMALEMENT
```

23 | HT | CHR$(9)

```
10 LPRINT "#123#";"#123#";"#123#"
20 LPRINT "#123#";CHR$(9);"#123#";CHR$(9);"#123#"
```

```
#123##123##123#
#123#    #123#    #123#
```

24 | ESC | (| nnn, ,nnn. | CHR$(27);"(nnn, ,nnn."

25 | ESC |) | nnn, ,nnn. | CHR$(27);")nnn, ,nnn."

"nnn" represents the set-position of the tab and is a 3-digit decimal number.
"nnn" représante le positionnement de la tabulation et est un nombre décimal de trois chiffres.

Specify the horizontal tab setting, beginning with the lowest number ascending to the higher numbers. The instructions are ignored when a number is smaller than the preceding number.
Spécifie le réglage horizontal des tabulateurs, en commençant par le nombre le plus bas pour remonter jusqu'au plus élevé. Les instructions sont ignorées si un nombre est inférieur au nombre précédent.

26 | ESC | 2 | CHR$(27);"2"

```
10 POKE &HF418,1
20 LPRINT CHR$(27);"2";
30 LPRINT CHR$(27);"(020,035,060."
40 LPRINT CHR$(9);"#123#";CHR$(9);"#123#";CHR$(9);"#123#"
50 POKE &HF418,0
```

```
                #123#          #123#                #123#
```

The maximum number of tabs that can be set is 32.
Le nombre maximal de tabulateurs que l'on peut sélectionner est de 32.

When entering new tab setting positions, using CHR$ (9), these may be influenced by the standard MSX tab handling. You can avoid this by changing to the straight printing mode, using POKE & HF418, 1. You can change back to the original MSX mode via POKE & HF418,0.
L'introduction de nouvelles valeurs de tabulation peut être influencée par la gestion MSX standard des tabulations.
Ceci peut être évité en passant au mode d'impression direct en utilisant, POKE & HF418, 1.
Vous pouvez revenir au mode originel MSX en utilisant POKE & 418, 1.

27	ESC O nnn	CHR$(27);"Onnn"	001<nnn<220
28	ESC O I nn	CHR$(27);"OInn"	01<nn<99
29	ESC O S nn	CHR$(27);"OSnn"	01<nn<99

```
10 LPRINT CHR$(27);"OI01";
20 LPRINT CHR$(27);"OS02";
30 FOR I=0 TO 9
40 LPRINT "PAGE LENGTH AND SKIP PERFORATION/
LONGEUR DE PAGE ET SAUT DE PERFERATIONS"
50 NEXT
```

```
PAGE LENGTH AND SKIP PERFORATION/LONGEUR DE PAGE ET SAUT DE PERFERATIONS
PAGE LENGTH AND SKIP PERFORATION/LONGEUR DE PAGE ET SAUT DE PERFERATIONS
PAGE LENGTH AND SKIP PERFORATION/LONGEUR DE PAGE ET SAUT DE PERFERATIONS
PAGE LENGTH AND SKIP PERFORATION/LONGEUR DE PAGE ET SAUT DE PERFERATIONS

PAGE LENGTH AND SKIP PERFORATION/LONGEUR DE PAGE ET SAUT DE PERFERATIONS
PAGE LENGTH AND SKIP PERFORATION/LONGEUR DE PAGE ET SAUT DE PERFERATIONS
PAGE LENGTH AND SKIP PERFORATION/LONGEUR DE PAGE ET SAUT DE PERFERATIONS
PAGE LENGTH AND SKIP PERFORATION/LONGEUR DE PAGE ET SAUT DE PERFERATIONS

PAGE LENGTH AND SKIP PERFORATION/LONGEUR DE PAGE ET SAUT DE PERFERATIONS
PAGE LENGTH AND SKIP PERFORATION/LONGEUR DE PAGE ET SAUT DE PERFERATIONS
```

31 | ESC | / | nnn | CHR$(27);"/nnn" 000<nnn<136

```
10 LPRINT CHR$(27);"/020";
20 FOR I=0 TO 20
30 LPRINT "MARGIN/MARGE";
40 NEXT
```

```
MARGIN/MARGEMARGIN/M
ARGEMARGIN/MARGEMARG
IN/MARGEMARGIN/MARGE
MARGIN/MARGEMARGIN/M
ARGEMARGIN/MARGEMARG
IN/MARGEMARGIN/MARGE
MARGIN/MARGEMARGIN/M
ARGEMARGIN/MARGEMARG
IN/MARGEMARGIN/MARGE
MARGIN/MARGEMARGIN/M
ARGEMARGIN/MARGEMARG
IN/MARGEMARGIN/MARGE
```

32 | ESC | L | nnn | CHR$(27);"Lnnn" 000<nnn<136

```
10 LPRINT CHR$(27);"L040";
15 LPRINT CHR$(27);"/060";
20 FOR I=0 TO 20
30 LPRINT "MARGIN/MARGE";
40 NEXT
```

```
MARGIN/MARGEMARGIN/M
ARGEMARGIN/MARGEMARG
IN/MARGEMARGIN/MARGE
MARGIN/MARGEMARGIN/M
ARGEMARGIN/MARGEMARG
IN/MARGEMARGIN/MARGE
MARGIN/MARGEMARGIN/M
ARGEMARGIN/MARGEMARG
IN/MARGEMARGIN/MARGE
MARGIN/MARGEMARGIN/M
ARGEMARGIN/MARGEMARG
IN/MARGEMARGIN/MARGE
MARGIN/MARGE
```

33 | ESC | A | CHR$(27);"A"

34 | ESC | B | CHR$(27);"B"

```
10 LPRINT CHR$(27);"A";
20 FOR I=1 TO 5
30 LPRINT "LINE FEED 1/6 INCH/SAUT DE LIGNE 1/6 POUCE"
40 NEXT
50 LPRINT CHR$(27);"B";
60 FOR I=1 TO 5
70 LPRINT "LINE FEED 1/9 INCH/SAUT DE LIGNE 1/9 POUCE"
80 NEXT
```

```
LINE FEED 1/6 INCH/SAUT DE LIGNE 1/6 POUCE
LINE FEED 1/6 INCH/SAUT DE LIGNE 1/6 POUCE
LINE FEED 1/6 INCH/SAUT DE LIGNE 1/6 POUCE
LINE FEED 1/6 INCH/SAUT DE LIGNE 1/6 POUCE
LINE FEED 1/6 INCH/SAUT DE LIGNE 1/6 POUCE
LINE FEED 1/9 INCH/SAUT DE LIGNE 1/9 POUCE
LINE FEED 1/9 INCH/SAUT DE LIGNE 1/9 POUCE
LINE FEED 1/9 INCH/SAUT DE LIGNE 1/9 POUCE
LINE FEED 1/9 INCH/SAUT DE LIGNE 1/9 POUCE
LINE FEED 1/9 INCH/SAUT DE LIGNE 1/9 POUCE
```

35 | ESC | T | nn | CHR$(27);"Tnn" 00<nn<99

```
10 LPRINT CHR$(27);"T10";
20 LPRINT "LINE FEED 10/144 INCH/SAUT DE LIGNE 10/144 POUCE"
30 LPRINT CHR$(27);"T30";
40 LPRINT "LINE FEED 30/144 INCH/SAUT DE LIGNE 30/144 POUCE"
50 LPRINT CHR$(27);"T50";
60 LPRINT "LINE FEED 50/144 INCH/SAUT DE LIGNE 50/144 POUCE"
70 LPRINT CHR$(27);"T70";
80 LPRINT "LINE FEED 70/144 INCH/SAUT DE LIGNE 70/144 POUCE"
90 LPRINT CHR$(27);"T90";
100 LPRINT "LINE FEED 90/144 INCH/SAUT DE LIGNE 90/144 POUCE"
```

```
LINE FEED 10/144 INCH/SAUT DE LIGNE 10/144 POUCE
LINE FEED 30/144 INCH/SAUT DE LIGNE 30/144 POUCE
LINE FEED 50/144 INCH/SAUT DE LIGNE 50/144 POUCE

LINE FEED 70/144 INCH/SAUT DE LIGNE 70/144 POUCE


LINE FEED 90/144 INCH/SAUT DE LIGNE 90/144 POUCE
```

36 | ESC | Z | nn | CHR$(27);"Znn" 00<nn<99

```
10 LPRINT CHR$(27);"Z10";
20 LPRINT "LINE FEED 10/216 INCH/SAUT DE LIGNE 10/216 POUCE"
30 LPRINT CHR$(27);"Z20";
40 LPRINT "LINE FEED 20/216 INCH/SAUT DE LIGNE 20/216 POUCE"
50 LPRINT CHR$(27);"Z30";
60 LPRINT "LINE FEED 30/216 INCH/SAUT DE LIGNE 30/216 POUCE"
70 LPRINT CHR$(27);"Z40";
80 LPRINT "LINE FEED 40/216 INCH/SAUT DE LIGNE 40/216 POUCE"
```

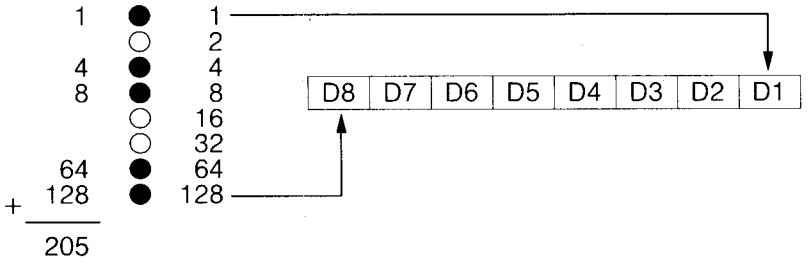
```
LINE FEED 10/216 INCH/SAUT DE LIGNE 10/216 POUCE
LINE FEED 30/216 INCH/SAUT DE LIGNE 30/216 POUCE
LINE FEED 40/216 INCH/SAUT DE LIGNE 40/216 POUCE
```

43 | BEL | CHR$(7)

```
10 FOR I=0 TO 10
20 LPRINT CHR$(7);
30 NEXT
```

45 | ESC | G | nnn | mmmm | CHR$(27);"Gnnnmmmm" 0000<mmmm<9999

```
000<nnn<065   60 dots/inch  60 points/pouce
066<nnn<075   72 dots/inch  72 points/pouce
076<nnn<085   80 dots/inch  80 points/pouce
086<nnn<095   90 dots/inch  90 points/pouce
096<nnn<125  120 dots/inch 120 points/pouce
126<nnn<145  136 dots/inch 136 points/pouce
146<nnn<999  240 dots/inch 240 points/pouce
```



Graphic data and the corresponding dots. Données graphiques et points correspondants.

```
10 LPRINT CHR$(27);"G062";"0320";
20 FOR I=1 TO 320
30 LPRINT CHR$(205);
40 NEXT
50 LPRINT
60 LPRINT CHR$(27);"G240";"0320";
70 FOR I=1 TO 320
80 LPRINT CHR$(205);
90 NEXT
```

"mmmm" specifies the length of the bit pattern.
"mmmm" spécifie la longueur de la configuration binaire.

46 | ESC | S | mmmm | CHR$(27);"Smmmm" 0000<mmmm<9999

Printing mode	Dots/Inch
Pica (10 CPI)	**80**
Elite (12 CPI)	**96**
Condensed (17 CPI)	**136**
Proportional	**90**

```
10 POKE &HF418,1
20 LPRINT CHR$(27);"S0255";
30 FOR I=1 TO 255
40 LPRINT CHR$(I);
50 NEXT
60 POKE &HF418,0
```

"mmmm" specifies the length of the bit pattern.
"mmmm" spécifie la longueur de la configuration binaire.

Note:
POKE & HF 418,1 serves to suppress the generation of tabs by the MSX computer.
Attention:
POKE & HF 418,1 sert à supprimer la génération par l'ordinateur des positions de MSX tabulateur.

48 | ESC | X | CHR$(27);"X"

49 | ESC | Y | CHR$(27);"Y"

```
10 LPRINT CHR$(27);"X";
20 LPRINT "LETTER QUALITY";
30 LPRINT CHR$(27);"Y";
40 LPRINT " PRINTER";
```

LETTER QUALITY PRINTER

50 BS CHR$(8)

```
10 LPRINT "-------";
20 LPRINT CHR$(8);CHR$(8);CHR$(8);
30 LPRINT "XXXXXX"
```

```
---XXXXXX
```

APPENDIX B

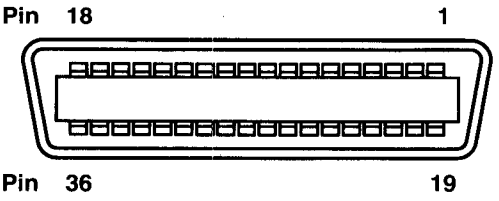
Character category			Character structure (H x V + space)	Maximum column number	Character spacing (CPI)	Print speed (CPS)
Standard character	Standard	Pica	12* x 9	80	10	120
		Elite	12* x 9	96	12	120
		Condensed	14* x 9	137	17	85
	L.Q.	Pica	24* x 18	80	10	25
		Elite	24* x 18	96	12	30
Italic character	Standard	Pica	16* x 9	80	10	100
		Elite	16* x 9	96	12	60
		Condensed	18* x 9	137	17	85
	L.Q.	Pica	32* x 18	80	10	25
		Elite	32* x 18	96	12	30

** Includes half dot*

DEC	HEX	CHAR	DEC	HEX	CHAR	DEC	HEX	CHAR	DEC	HEX	CHAR	DEC	HEX	CHAR	DEC	HEX	CHAR	DEC	HEX	CHAR
32	20		64	40	@	96	60	`	128	80	Ç	160	A0	á	192	C0	┐	224	E0	α	1,64	1,40	
33	21	!	65	41	A	97	61	a	129	81	ü	161	A1	í	193	C1	┴	225	E1	ß	1,65	1,41	☺
34	22	"	66	42	B	98	62	b	130	82	é	162	A2	ó	194	C2	┬	226	E2	Γ	1,66	1,42	☻
35	23	#	67	43	C	99	63	c	131	83	â	163	A3	ú	195	C3	├	227	E3	π	1,67	1,43	♥
36	24	$	68	44	D	100	64	d	132	84	ä	164	A4	ñ	196	C4	─	228	E4	Σ	1,68	1,44	♦
37	25	%	69	45	E	101	65	e	133	85	à	165	A5	Ñ	197	C5	┼	229	E5	σ	1,69	1,45	♣
38	26	&	70	46	F	102	66	f	134	86	å	166	A6	ª	198	C6	╞	230	E6	µ	1,70	1,46	♠
39	27	'	71	47	G	103	67	g	135	87	ç	167	A7	º	199	C7	╟	231	E7	τ	1,71	1,47	•
40	28	(	72	48	H	104	68	h	136	88	ê	168	A8	¿	200	C8	╚	232	E8	Φ	1,72	1,48	◘
41	29	)	73	49	I	105	69	i	137	89	ë	169	A9	⌐	201	C9	╔	233	E9	Θ	1,73	1,49	○
42	2A	*	74	4A	J	106	6A	j	138	8A	è	170	AA	¬	202	CA	╩	234	EA	Ω	1,74	1,4A	◙
43	2B	+	75	4B	K	107	6B	k	139	8B	ï	171	AB	½	203	CB	╦	235	EB	δ	1,75	1,4B	♂
44	2C	,	76	4C	L	108	6C	l	140	8C	î	172	AC	¼	204	CC	╠	236	EC	∞	1,76	1,4C	♀
45	2D	-	77	4D	M	109	6D	m	141	8D	ì	173	AD	¡	205	CD	═	237	ED	Ø	1,77	1,4D	♪
46	2E	.	78	4E	N	110	6E	n	142	8E	Ä	174	AE	«	206	CE	╬	238	EE	∈	1,78	1,4E	♫
47	2F	/	79	4F	O	111	6F	o	143	8F	Å	175	AF	»	207	CF	╧	239	EF	∩	1,79	1,4F	☼
48	30	0	80	50	P	112	70	p	144	90	É	176	B0	▒	208	D0	╨	240	F0	≡	1,80	1,50	†
49	31	1	81	51	Q	113	71	q	145	91	æ	177	B1	▓	209	D1	╤	241	F1	±	1,81	1,51	┴
50	32	2	82	52	R	114	72	r	146	92	Æ	178	B2	│	210	D2	╥	242	F2	≥	1,82	1,52	┬
51	33	3	83	53	S	115	73	s	147	93	ô	179	B3	┤	211	D3	╙	243	F3	≤	1,83	1,53	┤
52	34	4	84	54	T	116	74	t	148	94	ö	180	B4	╡	212	D4	╘	244	F4	⌠	1,84	1,54	├
53	35	5	85	55	U	117	75	u	149	95	ò	181	B5	╢	213	D5	╒	245	F5	⌡	1,85	1,55	┼
54	36	6	86	56	V	118	76	v	150	96	û	182	B6	╖	214	D6	╓	246	F6	÷	1,86	1,56	│
55	37	7	87	57	W	119	77	w	151	97	ù	183	B7	╕	215	D7	╫	247	F7	≈	1,87	1,57	─
56	38	8	88	58	X	120	78	x	152	98	ÿ	184	B8	╣	216	D8	╪	248	F8	°	1,88	1,58	┌
57	39	9	89	59	Y	121	79	y	153	99	Ö	185	B9	║	217	D9	┘	249	F9	∙	1,89	1,59	┐
58	3A	:	90	5A	Z	122	7A	z	154	9A	Ü	186	BA	╗	218	DA	┌	250	FA	·	1,90	1,5A	└
59	3B	;	91	5B	[	123	7B	{	155	9B	¢	187	BB	╝	219	DB	█	251	FB	√	1,91	1,5B	┘
60	3C	<	92	5C	\	124	7C	¦	156	9C	£	188	BC	╜	220	DC	▄	252	FC	ⁿ	1,92	1,5C	X
61	3D	=	93	5D	]	125	7D	}	157	9D	¥	189	BD	╛	221	DD	▌	253	FD	²	1,93	1,5D	/
62	3E	>	94	5E	^	126	7E	~	158	9E	₧	190	BE	┐	222	DE	▐	254	FE	■	1,94	1,5E	\
63	3F	?	95	5F	_	127	7F	⌂	159	9F	ƒ	191	BF	└	223	DF	▀	255	FF		1,95	1,5F	+

APPENDIX D

PARALLEL INTERFACE SPECIFICATION



Pin	Signal	Pin	Signal
1	$\overline{\text{STROBE}}$	19	GROUND
2	DATA 1	20	GROUND
3	DATA 2	21	GROUND
4	DATA 3	22	GROUND
5	DATA 4	23	GROUND
6	DATA 5	24	GROUND
7	DATA 6	25	GROUND
8	DATA 7	26	GROUND
9	DATA 8	27	GROUND
10	RESERVE	28	GROUND
11	BUSY	29	GROUND
12	RESERVE	30	GROUND
13	RESERVE	31	RESERVE
14	GROUND	32	RESERVE
15	NOT CONNECTED	33	GROUND
16	GROUND	34	NOT CONNECTED
17	RESERVE	35	RESERVE
18	NOT CONNECTED	36	NOT CONNECTED

1. Cable side connector (DDK 36 pin Type 57-3060-D8 or equivalent).
2. Printer side connector.

CONTROL CODES

	SYMBOL	CODE IN BASIC	FUNCTION
1	CR	CHR$(13)	Carriage return after printing.
2	LF	CHR$(10)	Carriage return and line feed after printing.
3	VT	CHR$(11)	Same as LF.
4	FF	CHR$(12)	Form feed after printing.
		The four commands above are print commands	
5	ESC,N	CHR$(27);"N"	10 cpi (pica) printing on.
6	ESC,E	CHR$(27);"E"	12 cpi (elite) printing on.
7	ESC,Q	CHR$(27);"Q"	17 cpi (condensed) printing on.
8	ESC,P	CHR$(27);"P"	Proportional printing on.
9	SO	CHR$(14)	Double width mode on.
10	SI	CHR$(15)	Double width mode off.
11	ESC,!	CHR$(27);"!"	Letter Quality printing on.
12	ESC,"	CHR$(27);CHR$(34)	Letter Quality printing off.
13	ESC,C,S	CHR$(27);"CS"	Superscript printing on.
14	ESC,C,s	CHR$(27);"Cs"	Superscript printing off.
15	ESC,C,U	CHR$(27);"CU"	Subscript printing on.
16	ESC,C,u	CHR$(27);"Cu"	Subscript printing off.
17	ESC,C,I	CHR$(27);"CI"	Italic printing on.
18	ESC,C,i	CHR$(27);"Ci"	Italic printing off.
19	ESC,C.B	CHR$(27);"CB"	Bold printing on.
20	ESC,C,b	CHR$(27);"Cb"	Bold printing off.
21	ESC,C,D	CHR$(27);"CD"	Double strike printing on.
22	ESC,C,d	CHR$(27);"Cd"	Double strike printing off.
23	HT	CHR$(9)	Move to next horizontal tab position.
24	ESC,(	CHR$(27);"("	Horizontal tab position setting.
25	ESC,)	CHR$(27);")"	Clears part of horizontal tabs.
26	ESC,2	HR$(27);"2"	Clears all horizontal tabs.
27	ESC,O,"nnn"	CHR$(27);"Onnn"	Page length setting in line units.
28	ESC,O,I,"nn"	CHR$(27);"OInn"	Page length setting in inches.
29	ESC,O,S,"nn"	CHR$(27);"OSnn"	Perforation skip line setting.
30	ESC,O,S,00	CHR$(27);"OS00"	Perforation skip off.
31	ESC,/,"nnn"	CHR$(27);"/nnn"	Right margin setting.
32	ESC,L,"nnn"	CHR$(27);"Lnnn"	Left margin setting.
33	ESC,A	CHR$(27);"A"	Selects 1/6" line feed.
34	ESC,B	CHR$(27);"B"	Selects 1/9" line feed.
35	ESC,T,"nn"	CHR$(27);"Tnn"	Selects "nn"/144" line feed.
36	ESC,Z,"nn"	CHR$(27);"Znn"	Selects "nn"/216" line feed.
37	ESC,[	CHR$(27);"["	Selects uni-directional printing.
38	ESC,]	CHR$(27);"]"	Selects bi-directional printing.
39	ESC,p	CHR$(27);"p"	Paper-out detection on.
40	ESC,q	CHR$(27);"q"	Paper-out detection off.
41	ESC,CR	CHR$(27);CHR (13)	Moves print head to home position.
42	ESC,@	CHR$(27);"@"	Resets printer.
43	BEL	CHR$(7)	Sounds buzzer (0.3 sec).
44	CAN	CHR$(24)	Clears buffer.
45	ESC,G,"nnn"	CHR$(27);"Gnnn"	"nnn" dots/inch graphic printing density.
46	ESC,S	CHR$(27);"S"	Graphics printing dots/inch depending on print mode.
47	SOH	CHR$(1)	Code to precede special symbol code (See Appendix C).
48	ESC, X	CHR$(27);"X"	Underline printing on.
49	ESC, Y	CHR$(27);"Y"	Underline printing off.
50	BS	CHR$(8)	Back space (1 character).

Note:
"n" in the above symbols and BASIC codes corresponds with the numbers 0-9 in the ASCII code table.