## PHILIPS

## 80 COLUMN LETTER QUALITY MATRIX PRINTER



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## LEITER-QUALTYMATRIX PRINTER



## 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 OUTINDICATOR

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 CASSEITE © ${ }^{4}$

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 (B) 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 (4) into the proper posoition for your left margin.
e. Set the right paper guide (5) 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 (66) 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 (1) 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 (88).

## Mounting the tractor unit (18) 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 (0) 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 (2).
e. Push the rear of the tractor unit down so the spring loaded hooks (2) click into position.
f. Open both tractor covers (33.
g. Insert the paper into the printer loosely, as far as it will go (2f).
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.
I. 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 (23). Then close the tractor covers again.
n. Now mount the paper shelf again and put it in horizontal position (2). (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 PRINTHEAD (2)

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.

## TESTFUNCTIONS

## 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 ©

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 $\rightarrow$ 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 $\leftarrow$ 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 $\rightarrow$ 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 SEITING

The following functions can be selected by using the dip switches, located at the back of the printer (0.). 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 |
| 12 |  |
| 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 |
| 45 |  |
| 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.

## DIP SWITCH SEITING

The following functions can be selected by using the dip switches, located at the back of the printer (26). 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

SWITCHNO.
12
OFF OFF
OFF ON
ON OFF
ON ON
FUNCTION
Page length is set to 12 inches.
Page length is set to 8 inches.
Page length is set to 11 inches.
Page length is set to 14 inches.

## Italic character setting

Switch 3 ON
Italic characters.
Standard characters.
Character mode setting
SWITCH NO.
45
OFF OFF
OFF ON
ON OFF
ON
FUNCTION
Pica mode (10 cpi)
Elite mode (12 cpi)
Condensed mode (17 cpi)
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.

## CONTROLCODES

## 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.

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For examples see Appendix A.

|  | SYMBOL | CODE IN BASIC | FUNCTION |
| :---: | :---: | :---: | :---: |
| 1 | CR | CHR\$(13) | Carriage return after printing. Carriage return and line feed after printing. |
| 2 | LF | CHR\$(10) |  |
| 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);"Cl" | 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);"Olnn" | Page length setting in inches. |
| 29 | ESC,O,S,"nn" | CHR\$(27);"OSnn" | Perforation skip line setting. |
| 30 | ESC,O,S,00 | CHR\$(27);"OSO0" | 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, $\mathrm{T}^{\prime}$ "nn" | CHR\$(27);"Tnn" | Selects "nn"/144" line feed. |
| 36 | ESC,, ,"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: <br> - 8 dots vertically <br> - Horizontal density (dots/inch): $60,72,80,90,120,136$, and $240^{*}$. |
| 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 |
|  | Friction feed |
|  | Pin-feed |
| Paper transport | Minimum $1 / 216$ inch |
|  | 6.7 lines $/$ second ( 6 lines/inch $)$ |
| Line feed pitch | Minimum width: 4 inches |
| Line feed speed | Maximum width: 10 inches |
| Paper width | 50 to $80 \mathrm{~g} / \mathrm{m}$ |
|  | Max. original +2 copies, using paper with a combined thickness of max. |
|  | 0.2 mm. |
| Paper weight | Single colour (black) in cassette. Number of impressions: approx |
| Number of copies | 2,5 million (draft quality) |
|  | $5^{\circ}$ to $35^{\circ} \mathrm{C}$ |
| Ribbon | $-30^{\circ}$ to $+60^{\circ} \mathrm{C}$ |
|  | $230 \mathrm{VAC}( \pm 15 \%)$ |
| Operating temperature | $50 \mathrm{~Hz}( \pm 3 \%)$ |
| Storage temperature | During operation: Approx. 80 W |
| Power supply | While idling $\quad$ Approx. 15 W |
|  | $403 \times 119 \times 278$ mm (without paper shelf) |
| Power consumption | 4.8 kg |
|  |  |

## CHARACTER CATEGORY SPECIFICATIONS

See Appendix B

## CHARACTER SETTABLES

```
See Appendix C
```


## 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.

## APPENDIXA

```
1 \mathrm { CR } \mathrm { CHRS } \mathrm { (13) }
TO LPFTNT " FFTNTEF":
```



```
BO LFRTNT " IMFFIMANTE:"
```


NG 4431 FFTNTEF
NME 14 स MFFTMANTE
2 LF
TO LFGTNT "LTNE/LTGNE ?"
QO LFRNT CHFक(10);
Q LFFTNT "LTNE/LTGNE 3"
M ME/TMNE -
LINEFIGNE


5

6 CHR\$ (27);"E"

| 7 | ESC | Q |
| :--- | :--- | :--- | CHR\$ (27):"Q"

10 LFAXNT CHFO(27);"N"
Q LFFINT "12G45ETESO FTGA"
OO LFRTNT CHFक (27);"E"
40 LFFINT "12E45ETGSOI ELTHE"
SO LFRTUT CHRक (27);"Q"


1945759 FTCA
123456789012 ELITE
12345679901234567 COADENGED
$9 \quad \mathrm{SO}$
CHR\$ (14)

10 SI
CHRS (15)

玉O $\operatorname{GRANT}$ "ODUGLE WDTH/DDUELE LARGEUF"
O LFRENT CHRक $15 \%$;
4O LFTANT "NOFAML/NORHALEMENT"
 NOTMAL/NOFMALEMENT

```
10 LFRTNT CHFक(27):"!";
ZO LFFINT "QUALITY/QUALTTE"
30 LPETNT CHFक(2,%,CHRक(34):
4O LPRTNT "QUALITY OUT/QUALTTE TERMTNE"
```

QUALITY/QUALITE
QUALITY OUT QUALITE TERMINE

13 | ESC | CS |
| :--- | :--- |

| $E S C$ | $C S$ |
| :--- | :--- |

10 LFRXNT "X+X";
2O LFFINT CHFT(2T):"CE":
OO LFRINT "2":
40 LFRINT CHBक 27 )"Cs":
5O LFFTMT "=0"
$x+x=0$
15 ESC CU
CHR\$ (27) ; "CU"

16 | ESC | Cu |
| :---: | :---: |

    CHR\$ (27);"Cu"
    ```
10 LFRTNT "H";
OO LPERMT CHEक(27):"GU";
OO LFRENT "2";
40 LPRTNT CHFOCZ, "Cu":
50 EFRNNT "O"
```

$\mathrm{H}_{2} \mathrm{O}$
18 ESC C1
18 ESC C1
CHR\$ (27);"C1"
CHR\$ (27);"C1"
10 LFRTNT CHFक(2न):"CR":
10 LFRTNT CHFक(2न):"CR":
2O LFETMT "TTALIC/NODE TTALIQUEE"
2O LFETMT "TTALIC/NODE TTALIQUEE"
O LFETNT CHFक(2%):"Ci":
O LFETNT CHFक(2%):"Ci":
4O LFRINT "NORAML/NORMALEMENT"
4O LFRINT "NORAML/NORMALEMENT"
ITALIQMDDE ITALIGUES
WORHAL NORMALEAENT

CHR\$ (27);"CB"

20 | ESC | Cb |
| :--- | :--- |


10 LFRTNT CHEक $27{ }^{\circ}$ "CE"
2O LARART "EOLD/CARACTEFES GRAS"
OO LFETNT CHEक(27); "CE":
40 LFRIMT "NORMAL/NORHALEMENT":

BOLD/CARACTERES GRAS
NORHAL. /NORMALEMENT

21 ESC

22 | ESC | Cd |
| :--- | :--- |

CHR\$ (27);"Cd"






DOUELE STRIKE/DOUELE SOULIGNE
NOFmAL NOFHAGEVET





＂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＂

```
| FOKE RHW41%,
20 &FFTNT CHF*(27):"2",
```




```
GO FOFE &HF4|%,0
```

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.


28 | $E S C$ | $O$ | $I$ | nn |
| :--- | :--- | :--- | :--- |

29 ESC

```
10 LPTRNT CHFक(27, "OTO!":
O LFRNNT CHFक(27);"DSQ2";
O FOF I=O TO 9
AO LFRTNT "FAGE LENGTH AND SKIF FEFFORATMOH
LONGEUR DE PAGE ET GAUT DE FEFEERATIONQ"
SO NEXT
PAGE LENGTH AND SETF FEFFDRATION/LONGEUK DE FAGE ET GAUT DE FEFFERATTONE
FAGE ENGTH AND GLTF FERFORATGON/LONGEUF DE FAGE ET EAUT DE FERGEFATTONS
FAOE LENGTH AND EXTF PERFORATION/LONGEUR DE PAGE ET SAUT DE FEFFEFATRONE
FAGE LENGTH ANO EGTF PERFORATION/LONGEUF DE FAGE ET GAUT DE FERFERATIONS
FAGE LENGTH AND SKIF FEFFORATION/LONGEUK DE FAGE ET SAUT DE FERFERATIONE
FAGE LENGTH ANO EKIF FERTGFATTON/LONGEUR DE FAGE ET EAUT DE FERGERATYONS
FAGE LENGTH AND EKTF FEFFORATTON/LONGEUN DE FAGE ET GAUT DE FERFERATXONG
FAGE LENGTH ANO GLTP FEFTOFATION/LONGEUF DE FAGE ET EAUT DE FFFFERATMONE
FAGE LENGTH AND SKIF FEFTOFATTON/LONGEUF DE FAGE ET SAUT DE FERFEFATIONE
FAGE LENGTH AND EGTF FEFTORATMON/LONGEUR DE FAGE ET SAUT DE FERGERATMONE
```

```
10 LFFTNT CHFक(27);"/020":
20 FOF I=O TO 2O
SO LPFTNT "MARGIN/MARGE":
4O NEXT
```

MARGIN/MARGEMARGIN/F ARCEMAFGIN/MARGEMAFG IN MARGEMARGTN/MARGE MARGIN/MAFGEMARGTN/M AFGEMAFGIN/MAFGEMARG IN/MARGEMARGTN/MARGE MAFGTH/MARGEMAFGTN/M AFGEMAFGTN/MARGEMARG IN/MARGEMARGTN/MARGE MAFGTN/MAGEEMARGIN/M AFGEMAFGTH/MARGEMARG TM/MARGEMARGTM/MARGE

```
32 ESC [ L Innn CHR$ (27);"Lnnn" 000<nnn<136
```

```
O LFFINT CHFक627, "LOLO";
15 LPRINT CHFS(27,"/OEO";
2O FOR I=O TO 2O
O LFETNT "MARGIN/MAFGE";
4O NEXT
```

MARGIN/MARGEMARGIN/M AREEMARGTN/MARGEMARG IN/MAFGEMARGTN/MARGE MARGIM/MARGEMAFGTN/M ARGEMARGTN/MAFGEMARC IN/MARGEMARGTN/MARCE MARGTN/MARGEMARGTN/M AFGEMARGIN/MAGEMAFG IN/MAFGEMARGIM/MAREE MARGTN/MARGEMAFGTN/M ABGEMAFGTN/ARGEMARG IN/MARGEMARGTN/MARGE magra/mafe

```
CHR$(27);"B"
```

```
10 LFFINT CHFw(27):"A":
OO FOR T=1 TOS
OO LPFINT "LINE FEED 1/E JNGH/SAUT DE LIGNE 1/E FOUCE"
4O NEXT
GO LFFJNT CHFO(2%);"E";
EO FOFR I=1 TO E
70 LPFJNT "LTNE FEED 1/G TNCH/EAUT DE LJGNE 1/G FOUCE"
0 NEXT
```

LINE FEED $1 / E$ INOH/EAUT DE LIGNE $1 / E$ FOUCE
LINE FEED 1/E TNOH/GAUT DE LIGNE $1 / E$ FOUCE
LINE FEED $1 / E$ TNCH/GAUT DE LTGNE $1 / E$ POUCE
LINE FEED $1 / E$ INCH/GAUT DE LIGNE $1 / E$ FOUCE
LINE FEED $1 / E$ INCH/GAUT DE LIGNE $1 / E$ FOUCE


35 | ESC | T | nn |
| :--- | :--- | :--- |

```
O LFRTNT CHEक(%7,"T10":
2O LPETNT "LTNE FEED IO/GA INCHFAUT DE LTGNE IOMAA POUCE"
उ० &FETNT OHRक(27):"TBO";
4O LFRTNT "LTNE FEED SO/|AL INCH/GAUT DE LTGNE FO/TAA POUCE"
SO |FRTNT CHRकQ2%:"T50";
EO LPGTNT "LINE FEED 5O/1AA INCH/कAUT DE LIGNE EO/144 POUCE"
70 LFPTNT OHRS(27);"T70";
GO LPRTNT "LINE FEED 7O/TA4 INCH/WAUT DE LIGNE 7O/IA4 FOUCE"
90 LFRTNT CHRक(27):"T90";
1OO LFRTNT "LINE FEED GO/|AA INCH/GAUT DE LIGNE GO/IAA FOUCE"
```

LANE FEEB $38 / 144$ ANEH/SAUT BE LIGNE $38 / 144$ FGUCE LINE FEED GO/144 TNCH/GAUT de Luge bo/144 pouce
LINE FEED $70 / 144$ InCH/GAUT DE LIGNE $70 / 144$ FOUCE
LINE FEED OO/44 INCH/GAUT DE LIGNE GO/144 FOUCE

| $000<n n n<065$ | 60 dots/inch | 60 points/pouce |
| :--- | ---: | ---: | :--- |
| $066<n n n<075$ | 72 dots/inch | 72 points/pouce |
| $076<n n n<085$ | 80 dots/inch | 80 points/pouce |
| $086<n n n<095$ | 90 dots/inch | 90 points/pouce |
| $096<n n n<125$ | 120 dots/inch 120 points/pouce |  |
| $126<n n n<145$ | 136 dots/inch 136 points/pouce |  |
| $146<n n n<999$ | 240 dots/inch 240 points/pouce |  |



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

```
1O LPRTNT CHR*C27,""GOE", "G%QO";
20 FOE I=1 TQ e%
30 &FRTNT CHFक(2O5%;
4O NEXT
EO LFETMT
GO LFETNT CHFक(27);"G2A0";"OE20";
70 एOF I=1 TO क्
BO GFFTNT EFFक(2O5);
90 NEXT
```

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

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

```
10 FOKE 8HF4!%,1
2O LPRTMT CHRक(27);"SOEE5";
GO FOR I=1 TO 255
4O LFFTNT CHFक(I):
5O NEXT
EO FOKE 8HF4!e,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 | $E S C$ | X |
| :--- | :--- |

49 CSC $\mathrm{Y} \quad$ CHRS (27); "Y"

```
10 LFFTNT OHRS(27):"X":
O LFRINT "LETTER OUALITY";
OO LFRINT OHRक(27);"Y":
4O LFRTNT " FRTNTEF";
```

LETTEF QUALTTY FRINTEF


## CHRS (8)

10 LFFTNT
"- - - .n- ………"
OO LFFMT
CHFt(E); CHF (E) © ©
$\because O$ LFETNT " AXXXXX


## APPENDIX B

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

[^0]
## APPENDIX B

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

* Includes half dot


## APPENDIX C

| $$ |  |
| :---: | :---: |
|  |  <br>  |
| $\begin{array}{\|l} \hline \\ \text { U } \\ \hline \end{array}$ |  <br>  |
| $\begin{array}{\|l\|} \hline \text { 呆 } \\ \text { 出 } \end{array}$ | ช®レトん |
| $\begin{aligned} & \bar{x} \\ & \text { 思 } \end{aligned}$ |  |
| $\begin{aligned} & \bar{U} \\ & \text { y } \\ & \hline \end{aligned}$ |  <br>  |
| 嵒 |  |
| $\left[\begin{array}{l} x \\ x \\ \cline { 2 - 2 } \end{array}\right.$ |  |
| $\begin{array}{\|l} \bar{u} \\ \hline \text { y } \\ \hline \end{array}$ |  <br>  |
| 号 |  |
| $\left[\begin{array}{l} \bar{x} \\ y y y y \\ \underline{玉} \end{array}\right.$ |  |
| $\begin{array}{\|l} \hline 0 \\ \text { 品 } \\ \hline \end{array}$ |  |
| － |  |
| $\left[\begin{array}{l} \bar{x} \\ \text { 嘼 } \end{array}\right.$ |  $\infty \infty \infty \infty \infty \infty \infty \infty \infty \infty \infty \infty \infty \infty \infty \infty$ ののののののののののののののの |
| $\begin{array}{\|c} -\bar{u} \\ \text { Min } \\ \hline \end{array}$ |  |
| 号 |  |
| $\left[\begin{array}{l} \bar{x} \\ \text { 㡙 } \end{array}\right]$ |  |
| $\begin{array}{\|l} \hline 0 \\ \text { 畧 } \end{array}$ |  |
| 㜽 |  |
| － | ○ন |
| $\begin{array}{\|c} 0 \\ \text { 㽞 } \\ \hline \end{array}$ |  |
| 号 |  |
| － |  |
| 宕 |  |

## APPENDIX D

## PARALLEL INTERFACE SPECIFICATION

|  |  | 18 | 1 |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  <br>  |  |  |  |
|  | Pin | 36 | 19 |  |
| Pin |  | Signal | Pin | Signal |
| 1 |  | 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); ${ }^{\text {N }}$ " | 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);"! ${ }^{\text {c }}$ | 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, Cid | 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);"OSOO" | 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 $1 / 6^{\prime \prime}$ line feed. |
| 34 | ESC,B | CHR\$(27);"B" | Selects $1 / 9^{\prime \prime}$ 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, ${ }^{\text {p }}$ | 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.






[^0]:    * Includes half dot

