

**USER  
MANUAL**

0527

# Print master

The printer utility ROM for the BBC micro

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# PRINTMASTER PRINTER TOOLKIT ROM

## INTRODUCTION

PRINTMASTER contains a whole host of useful utilities for the Epson printers FX80, RX80, MX100 and MX80 (See NOTE below). These include text and graphic screen dumps, large graphic and text printing, user definable character designing and a choice of text style. While PRINTMASTER has been designed to utilise many of the useful features of the Epson printers, a few of these may not be available on all models. Where discrepancies occur between printers these have been noted in the text of the relevant commands.

All PRINTMASTER's commands are accessed by entering an asterisk '\*' followed by the command name, and may be included into BASIC programs in the same way as all Operating System commands, e.g.

```
*TEXT <RETURN>
```

The command name may be entered in either upper or lower case, e.g.

\*text, \*TEXT and \*TeXt will all have the same effect.

It is possible to abbreviate most commands by ending the command word with a full stop, e.g.

\*WIN. is an abbreviation for \*WINDOW.

In general, the minimum abbreviation should be long enough to distinguish it from other commands with a similar name. (The bare minimum PRINTMASTER allows is 2/3 characters). However it is always safer to use the whole command word. Most commands have one or more arguments which may be optional or compulsory.

NOTE - Any printer which uses exactly the same control codes as the EPSON MX, RX and FX printers can also be used with this ROM, however most other printers are only partially compatible.

# THE HELP MENU

A listing of all the commands (with their syntax) that Printmaster understands can be displayed by typing:-

\*HELP PRINTMASTER <RETURN>

or any abbreviation down to

\*h.p. <RETURN> i.e.

PRINTMASTER (Epson)

DEFINE <chr>

FDUMP (<fsp>)

FONT <country>

GDUMP (<or,op>) (<X,Y>) (<gap>)

GPRINT <str> <X,Y> (<or,op>) (<gap>)

INITIALISE

ITALIC (<on/off>)

LINCH <lines per inch>

LINESPACE (<a>) (</b inches>)

MARGIN (<left>) (<right/+width>)

PAGELEN ((<inches/+lines>) (<skip>)

PCODE <codes/\$ASCII>

PROPORTION (<on/off>)

STYLE <str>

TAB <columns ..>

TDUMP (<udc width>)

TEXT (<width>) (<shade>) (<height>)

TPRINT <str> <chr> (<X,Y>) (<or,op>)

ULOAD <fsp>

UNDERLINE (<on/off>)

USAVE <fsp>

WINDOW

WVALS

All arguments are shown within angle brackets - <>

In "\*USAVE <fsp>" the 'fsp' stands for file specification or filename. Which means that when using \*USAVE a filename will be expected.

If a command is entered incorrectly with the wrong amount of arguments, (numbers or words), then the correct syntax of the command will be shown on the screen, stating what the command expects to find.

\*ULOAD expects to find a filename argument after the command so if \*ULOAD <RETURN> were entered without a filename, then the correct syntax for the command will be shown. i.e.

\*ULOAD <RETURN>

Syntax: ULOAD <fsp>

Some commands have arguments which need not be given and these are enclosed within parentheses - ()

For example with \*PROPORTION (<on/off>), \*PROPORTION <RETURN> will be accepted.

Some of the commands may have more than one argument.

For example \*MARGIN (<left>) (<right/+length>)

Note that if there is a comma in a command's syntax (<X,Y>) it implies that two numerical parameters are needed.

Arguments must be separated with either a space or a comma, e.g.

\*TEXT 1,1,1 or \*TEXT 1 1 1

Numerical arguments can be entered either directly in decimal or using the resident integer variables A% to Z%.

For example \*PAGELEN A%,52 and \*TEXT A% B%,1 are acceptable.

Again string arguments may be entered in two ways, either directly or with single letter string variables (i.e. A\$ to Z\$ and a\$ to z\$), e.g.

\*TPRINT A\$ 65

If a string has not previously been assigned before using it in a PRINTMASTER command, the error "No such variable" will be issued as in BASIC.

If strings are entered directly, quotes are optional unless the string contains spaces or commas, e.g.

The string "HELLO THERE" must be contained in quotes since it contains a space.

If there are several ROM's in your BBC computer, there may be a command name in PRINTMASTER which is the same as a command name in another ROM. If this is the case, then the letter "C" may be added as a prefix onto the command name to uniquely indicate that the PRINTMASTER's utility is the one required. e.g.

\*CDEFINE is the same command as \*DEFINE

The printer does not have to be enabled before and disabled after using PRINTMASTER's commands. PRINTMASTER automatically enables the printer (if required) at the beginning of its commands, and restores the printer to its previous state after the command.

IMPORTANT NOTICE: If the DIP switch in your printer is not set to perform a linefeed with a carriage return, (see printer manual), then a \*FX 6,0 must be issued. A symptom of the DIP switch not being set correctly is the printer not scrolling.

PRINTMASTER's commands are arranged in alphabetical order as in the index and help menu. The next section deals with all the commands in detail, and the appendices follow with details of the error messages, arguments and printer codes.

# \*DEFINE <chr>

This routine may be used to design or edit user definable characters, which may then be used with \*TPRINT,\*GPRINT and \*TDUMP. The routine uses screen MODE 4 as an editor so it is important that no data or BASIC programs are being stored in MODE 4's screen area before entry to this command.

When \*DEFINE is entered, a copy of characters from 32 to 255 are put at the top of the screen in a table. The centre of the screen shows the number of the character being defined or edited followed by the character itself. Below this is a box containing an enlarged version of the character and also a cursor. This cursor can be moved around the grid with various keys to define the character, (see keys below). Each individual block in the box represents a pixel in the character - each character being made up of 8 by 8 pixels in a grid format.

NOTE: If you have a GRAPHICS EXTENSION ROM selected in your machine, use a \*GFX 5 or a \*FX 20 or designing will not be possible.

Argument -

<chr> This is the character number to be edited or defined. Character codes 0 to 31 and 127 may not be defined.

## CONTROL KEYS

<X> or <→> moves the design cursor to the next square right.

<Z> or <←> moves the design cursor to the next square left.

</> or <↓> moves the design cursor to the next square down.

<:> or <↑> moves the design cursor to the next square up.

<RETURN> or <SPACE BAR> fills in the indicated square.

<SHIFT> clears the indicated square.

<R> Resets the current character to a blank.

When the design is complete either <TAB> or <ESCAPE> may be pressed.

<TAB> Defines the current character, then displays the next character for possible editing. If the next character cannot be defined because it is in the range 0-31 or 127, then these will be missed out.

<ESCAPE> Defines the character, enters the original screen mode before character definition, then exits the routine.

# \*FDUMP ( <fsp> )

This command transfers an ASCII file (or SPOOL file) to the printer while allowing the user to continue using the computer almost as normal, providing that the filing system is not tampered with. NOTE: Some games etc. may do this. If text from WORDWISE is to be printed then this should be saved with menu option 8 "Spool text". If a BASIC program is to be printed then this should first be spooled with the \*SPOOL command.

Argument -

<fsp> (OPTIONAL) This is a string argument which contains the filename of the file to be sent to the printer. If no filename is given then file to printer dumping will cease. e.g.

\*FDUMP "TEXT"

NOTE 1: If a long file is being transferred, the disc or cassette etc. should not be removed until the printing has ceased.

NOTE 2: If using a cassette for a file, the motor control should be used.

NOTE 3: The filing system should not be changed or reset during printing. If it is then printing will stop.

NOTE 4: The action of the <ESCAPE> key is changed during printing so that no buffers are cleared <during printing. This must be done to ensure that if <ESCAPE> is pressed the data sent to the printer is not corrupted. During the actual reading of the data the <ESCAPE> key is temporarily disabled.

NOTE 5: The error message "Can't dump file" is issued when -

1. The file was unable to be located on the disc.
2. For any other reason the file was unable to be opened.
3. An attempt was made to dump more than one file at a time. Only one file can be dumped at any one time.

NOTE 6: The file-dumping routine uses events so other event utilising routines should not be run simultaneously with this one.

NOTE 7: If the file being dumped contains linefeeds as well as carriage returns then double spaces may occur between lines. To overcome this problem the current linespacing may be halved, e.g. if the current linespacing is 1/6th (normal) then the new linespacing would be 1/12th (\*LINESPACE 1 12).

# \*FONT <country>

This changes the printer's international character set.

NOTE: Some of the character sets are not available on all printers, (see below).

Argument -

<country> this specifies the new international character set value. The value must lie between 0 and 10 and corresponds to the following countries.

Value	Country	AVAILABLE ON THESE PRINTERS
0.....	U.S.A.	RX80,FX80,MX100
1.....	France	RX80,FX80,MX100
2.....	Germany	RX80,FX80,MX100
3.....	England	RX80,FX80,MX100
4.....	Denmark I	RX80,FX80,MX100
5.....	Sweden	RX80,FX80,MX100
6.....	Italy	RX80,FX80,MX100
7.....	Spain	RX80,FX80,MX100
8.....	Japan	RX80,FX80
9.....	Denmark II	RX80
10.....	Norway	RX80

e.g. \*FONT 0 would select the U.S.A. character set.

# \*GDUMP (<or,op>) (<X,Y>) (<gap>)

This utility produces a high resolution graphic copy of an area of the screen on the printer. This works in any graphic MODE and MODE 7. The dumps automatically perform grey shading for all screen colours. For flashing colours the shade will correspond to the first colour, (e.g. for colour 9 - flashing red/cyan, the shade would be the same as for plain red.) The output can be positioned anywhere on the paper, and in 4 orientations (upside-down, sideways etc.) and can be of different sizes (not MODE 7). The region of the screen which is dumped to the printer is the area within the current graphic window for graphic modes (see \*WINDOW), or the area within the text window for MODE 7.

Arguments -

<or> (OPTIONAL)The dump can be printed at any of four orientations on the paper depending on the value of <or> as follows:-

Value	ORIENTATION
0	Normal top-to-top printing. If no argument is given this is assumed.
1	Rotated 90 degrees clockwise - (top-of-screen to right-edge of paper)
2	Rotated 180 degrees - (upside-down on paper)
3	Rotated 270 degrees clockwise - (top-of-screen to left-edge of paper)

<op> (OPTIONAL)-This refers to the dumping options. It specifies whether a multi-tone dump (grey shading for different screen colours) or a two-tone dump (just black & white) is required. This can also be printed in inverse colours, (black on screen will be white on paper, etc.)

## Summary

<op>	Output
0	Multi-tone dump - inverse colour
1	Two-tone dump - inverse colour
2	Multi-tone dump - true colour
3	Two-tone dump - true colour

NOTE: This value must not be greater than 3.

<X,Y> (OPTIONAL) This specifies the size of the dump. <X> specifies the number of 'graphic dots' to be printed horizontally per pixel on the screen, <Y> specifies the number of 'graphic dots' to be printed vertically per pixel on the screen.

<gap> (OPTIONAL) This can be used to shift the whole dump to any horizontal position on the paper. <gap> specifies the distance from the left margin to the desired printing position. One <gap> 'unit' is half the size of a normal pica mode character - this is equal to 1/20th of an inch.

#### NOTE 1

For MODE 7 dumps only one size and orientation is possible. This means that only <gap> and <op> are of any use here. <or> can only be zero.

#### NOTE 2

If some arguments are not given then the following defaults will be assumed -

<or> 0

<op> 0

<X,Y> <X>=1 and <Y>=2 for MODE 0.

<X>=3 and <Y>=2 for MODES 1 & 4.

<X>=6 and <Y>=2 for MODES 2 & 5.

<gap> 0

#### NOTE 3

If no window has been defined, the whole screen will be dumped.

#### NOTE 4

On exit from this routine, the linespacing will be reset to 1/6th of an inch.

#### Examples

\*GDUMP 0 0 1 1 gives the smallest possible sized upright dump positioned against the left hand margin.

\*GDUMP 1 1 2 4 20 gives a dump set 1 inch from the side of the paper in two-tone inverse colour shading. This would give a scale of 2 dots per pixel horizontally and 4 dots per pixel vertically. The image of the graphic window would also be rotated 90 degrees clockwise on the paper.

# \*GPRINT <str> <X,Y> (<or,op>) (<gap>)

This routine prints multi-sized characters in any one of eight orientations on the printer.

Arguments -

<str> This argument contains the string of characters which are to be printed. The string may also contain any of the computer's user-defined characters.

<X,Y> This specifies the size of the characters. <X> specifies the number of 'graphic dots' to be printed horizontally per pixel of the character. <Y> specifies the number of 'graphic dots' to be printed vertically per pixel of the character. If both sizes are set to 1, the resulting characters will be the same size as Elite characters. Thus, for a size 'n', the characters will be 'n' times the size of an Elite character in that dimension.

<or> (OPTIONAL)The string can be printed at any of four orientations in two directions depending on the value of <or> which may range from 0 to 7:-

<or>	Orientation	Direction
0 (default)	Normal	Across page
1	90 degrees	Down page.
2	180 degrees	Across page.
3	270 degrees	Down page.
4	90 degrees	Across page.
5	180 degrees	Down page.
6	270 degrees	Across page.
7	Normal	Down page.

<op> (OPTIONAL)This specifies the shading of the characters. This can be from 0-6 or 128-134.

If the value is 0-6, the shade of the characters is specified - 0 is the darkest, 6 is the lightest. If the value is 128-134 the characters are inversely printed (with a shaded background) - 128 is the darkest, 134 is the lightest.

<gap> (OPTIONAL)-This can be used to shift the printing to any horizontal position on the paper. <gap> specifies the distance from the left margin to the desired printing position. One <gap> 'unit' is half the size of a normal pica mode character - this is equal to 1/20th of an inch. Remember that if this argument is given then the previous arguments (<or/op>) would have to precede this value.

NOTE: On exit from this routine the linespacing will be reset to 1/6th of an inch.

#### Examples

```
*GPRINT "Normal Elite size 1.5 inches from the left margin" 1 1 0 0 30
 *GPRINT "Double width in inverse" 2 1 0 128
 *GPRINT "Quad width - triple height upside down" 4 3 2
 *GPRINT "Long characters in medium shading" 4 4 0 3
```

Try this program

```
5 REPEAT
10 INPUT "NAME "N$
20 FOR X%=0 TO 7
30 C%=RND(6)
40 *GPRINT N$,3,3,X%,C%
50 NEXT
60 UNTIL FALSE
```

# \*INITIALISE

Executing this command resets the printer to its initial starting state. (i.e. resets linespacing, character size, top of form, character set, etc.)

# \*ITALIC (<on/off>)

Not available on the MX printers.

This enables characters to be printed in italics (alternate character set).

(<on/off>) (OPTIONAL)-This is a string argument. If no argument is given or "ON" is given then italic character printing will be enabled. If any other string is given, e.g. "OFF" then italic printing will be disabled.

Examples -

\*ITALIC "ON" or \*ITALIC will turn italic printing on.

\*ITALIC OFF will turn italic printing off.

# **\*LINCH** <lines per inch>

(See also \*LINESPACE below.)

This sets the linespacing on the printer in terms of the number of lines to the inch. The default line spacing on most printers is six lines per inch.

Arguments -

<lines per inch> The number of printable lines to take up one inch of printer paper. There may be up to 216 lines per inch.

\*LINCH 5 would give 5 lines per inch.

# **\*LINESPACE** (<a> (</b inches>)

This sets the linespacing on the printer as a fraction of an inch between lines.

Arguments-

<a> (OPTIONAL)-The numerator part of a fraction e.g. the 9 in 9/216 which means a linespacing of nine 216ths of an inch. If this argument is omitted then a default of 1/6th of an inch will be assumed.

</b inches> (OPTIONAL)-The denominator part of the fraction eg. 216 in 9/216. This value will usually be 8,6,72 or 216 which relate to eighths, sixths, seventy-seconds and two hundred and sixteenths of an inch respectively.

This value may however be any factor of 216 ie. (1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 27, 36, 54, 72, 108 and 216).

Examples

\*LINESPACE 1 2 will set the linespacing to be half an inch. (1/2 inch).

\*LINESPACE 76 216 will set the linespacing to be 76/216ths of an inch.

# **\*MARGIN** (<left> (<right/+width>)

This command sets the left and/or right margin positions. The right margin may be set either as an absolute column position from the left edge of the paper or as the width of the paper in character columns. The actual position of both margins is dependent on the width of the characters currently being used. Thus, when using condensed characters, a left margin setting of 10 will be nearer the left edge of the paper than if large characters are being used.

Arguments -

(<left>)            The position of the left margin on the page. This causes all subsequent printing to be indented from the left edge by the specified number of characters. The actual indent is dependent on the width of the character in use. If this argument is omitted then the left margin will be set to zero.

(<right/+width>)    The position of the right margin on the page. This is measured in characters from the left hand edge. If a "+" character is given before the value then the text width (i.e. the number of characters between the left and right margins) will be specified instead. If this argument is omitted then the right margin will not be set.

e.g. \*MARGIN 10 70

This would indent all further text 10 spaces from the left. The right hand margin is 70 spaces from the left side of the page and thus the column width is 60 characters. The same result may be obtained by specifying the left margin and the column width directly, i.e.

\*MARGIN 10 +60

NOTE: The right margin position must be larger than the left margin position.

# \*PAGELEN (<inches/+lines>) (<skip>)

This command may be used to set the page length of the paper and the number of lines to be skipped at the perforation if you are using fan-fold paper. The page length can be specified either in inches per page or as a number of lines per page.

Arguments -

(<inches/+lines>) This either sets the page length by the number of inches or by the number of lines per page.

To set the length in terms of the number of inches, the argument is entered normally so that \*PAGE 11 would set the page length to be 11 inches.

To set the page length in lines the prefix "+" must be added to the value so that \*PAGELEN +70 would set the page length to 70 lines.

If this argument is omitted then the default value of 11 inches will be assumed.

(<skip>) The number of lines skipped at the end of each page. When using fan-fold paper the printer can be instructed to leave a gap over the perforation. This argument specifies the number of lines to be left blank at the bottom of a page.

For example -

\*PAGELEN 11 4

would set the page length to 11 inches with a skip over of 4 lines. Similarly,

\*PAGELEN 66 4

would set the page length to 66 lines of which 4 would be left blank over the perforation.

NOTE: It is important to position the print head at the top of the page when issuing this command to ensure that the skip occurs in the correct place.

# **\*PCODE** <codes/\$ASCII>

This command is used to send control codes to the printer. Control codes are used to change various printer options. These print codes are listed at the end of this manual.

Argument -

<codes/\$ASCII> This is a multiple argument. As many arguments may be given as required, each being separated by a space or comma, e.g. \*PCODE 20 30 40 etc. Each argument represents a printer control code. The codes may be given in either ASCII or decimal. ASCII codes should be preceded by the prefix "\$", e.g. \*PCODE \$A.

If, for example, you wanted to execute a form feed, the control code in decimal for this is 12, thus the command would be -

```
*PCODE 12
```

If in addition to this you wanted to sound the printer's bell the command would be -

```
*PCODE 12 7
```

Any number of codes may be strung together like this as required. To disable the paper-end detector, the decimal control codes needed are 27 and 56. Therefore \*PCODE 27 56 will do this.

But the code 56 represents the ASCII character "8". (NOTE: the codes shown in the manual are ASCII and NOT decimal). This need not be converted into a decimal number but just left as the "8" prefixed by a "\$", so that the command

```
*PCODE 27 $8
```

 is identical to the above example.

# \*PROPORTION (<on/off>)

Available only on the Epson FX80 printer.

When printing text normally each character takes up a fixed character space whatever the letter is, i.e. the letter 'l' takes up the same space as the letter 'W' although 'W' is wider. On some of the Epson printers the character spacing can be set to be proportional to the width of the character. In this mode the letter 'l' takes up less space than the letter 'W', thus making the text look neater and more compact.

Argument -

(<on/off>) This is a string argument. If "ON" is given or the argument is omitted, proportional spacing is turned on. If any other string is given, e.g. "OFF", then proportional spacing will be turned off.

# \*STYLE <str>

See also \*TEXT.

NOTE: Some types of text selected with this command are not available on some printers, (see below).

The type of text printed by the printer may be changed with this command.

Argument -

<str> This contains the information for either setting or cancelling the print modes. To set a print mode, the string should contain an abbreviation for that print mode. To cancel a print mode, the letter "X" must be added in front of the abbreviation - see below.

The abbreviations are as follows:

MODE	MODE CODE	AVAILABLE ON PRINTERS
eNlarged	N	ALL
Condensed	C	ALL
eMphasised	M	ALL
Double strike	D	ALL
eLite	L	FX80,RX80
SuPerscript	SP or P	ALL
SuBscript	SB or B	ALL

Examples -

- \*STYLE "L" would set Elite mode characters
- \*STYLE "SP" and \*STYLE "P" can both be used to set superscript characters.
- \*STYLE "XM" cancels emphasised mode printing.
- \*STYLE "XL" restores normal characters after using Elite mode.

More than one abbreviation may be used in the one string. They can be separated by spaces for legibility if desired.

- \*STYLE "XMC" cancels emphasised and sets condensed modes.
- \*STYLE "D XSB N" sets enlarged and double strike modes and cancels subscript characters.

The error "Bad character" will be issued if an unknown abbreviation is given.

# **\*TAB** <columns ..>

Some of the Epson printers have horizontal tabulation stop positions. The tab positions are entered as a line of numbers, each number representing each tab position. If two or more tab positions are to be defined, each individual position must be separated by a comma or space.

e.g. \*TAB 11,22,33,44,55 will set tab positions at 11,22,33,44 and 55 columns from the left margin. Each time the printer is sent a CHR\$(9) or CHR\$(137) printing starts from the next column position.

NOTE: A CHR\$(137) may be accessed from the keyboard by pressing <SHIFT> and function key 9 together.

NOTE: The FX80 printer may have up to 32 tab positions, the MX100 and MX80 may only have 12 positions.

Try the following example -

```
PRINT "0123456789012345678901234567890123456789"
```

```
*TAB 6,18,30
```

```
PRINT "HELLO"+CHR$(137)+"FRED"+CHR$(137)+"JIM"+CHR$(137)+"DOG"
```

This would print on the printer the following:-

```
012345678901234567890123456789012456789
```

```
HELLO FRED          JIM          DOG
```

## **\*TDUMP** (<width>)

This command copies the text in the current text window to the printer. If no window has been set up then the whole screen will be copied. This command differs from \*GDUMP in that it prints text characters rather than graphically dumping them.

Argument -

<width> (OPTIONAL). The width of a user definable character. If the dump is carried out in modes 0 to 6 and user definable characters have been used on the screen then those particular characters will be graphically dumped to produce an image of the character on the paper. The width of the character may be varied for different text widths. The character would need to be smaller if the rest of the text was printed in normal width text rather than enlarged text. The width may range from 0 to 9 and the numbers relate to the following text widths -

<width>	Text width
0	Normal width
1	Enlarged

Widths 2 to 9 may be used for larger user definable characters.

# **\*TEXT** (<width>) (<shade>) (<height>)

See also \*STYLE.

This sets the current text printing mode on the printer by the width, height and shade of the character.

NOTE: Some of the print modes selected by this command are not available on some printers and will have no effect if used, (see below).

Arguments -

<width> (OPTIONAL) The new text width of characters on the printer. If this argument is omitted then normal width text will be assumed. The larger the width number the wider the text will be. The width may range from 0 to 5 which relate to the following print modes -

<width>	Print mode	AVAILABLE ON PRINTERS
0.....	Condensed	ALL
1.....	Elite	FX80,RX80
2.....	Normal	ALL
3.....	Enlarged Condensed	ALL
4.....	Elite Enlarged	ALL
5.....	Enlarged	ALL

(<shade>) (OPTIONAL) The new shade of the characters on the printer. If this argument is omitted then the normal shade will be assumed. The shade may range from 0 to 3 which relate to the following print modes -

<shade>	Print mode
0.....	Normal
1.....	Emphasised
2.....	Double strike
3.....	Emphasised/double strike

NOTE: In general the larger the shade number the darker the text will be. However with some widths of text emphasised mode, may be darker than double strike mode and also some shades may not be available for certain widths.

(<height>) (OPTIONAL) The height of the characters on the printer. If this argument is omitted then normal height text will be assumed. The height values represent the following print modes:-

<height>	Print mode
0.....	Subscript
1.....	Superscript
2.....	Normal

NOTE: Subscript and superscript modes enforce double strike printing.

Examples -

\*TEXT 5 3 selects the darkest largest characters.  
\*TEXT 0 2 1 selects condensed, superscript double strike characters.  
\*TEXT selects normal text.

Try this program -

```
5 VDU 2
10 FOR H%=0 TO 2
20 FOR W%=0 TO 5
30 FOR S%=0 TO 3
40 *TEXT W%,S%,H%
50 PRINT "HELLO"
60 NEXT
70 NEXT
80 NEXT
90 END
```

# \*TPRINT <str> <chr>(<X, Y>) (<or,op>)

This routine is similar to GPRINT except that the characters in the string to be printed are made up from normal text characters. This has the advantage of being much quicker than \*GPRINT although only the characters in the printer's characters set may be used to make up the letters in the string. As with \*GPRINT the text may be printed in various positions.

This command prints out the enlarged text on the screen and will only be sent to the printer if it has been enabled.

NOTE: Since some printers, such as the Epson MX 100, can hold wider paper than other Epsons some 'error detection' has deliberately been omitted. So if a long string of text is printed across the page it may well go off the edge and start on the next line, thus disrupting the overall text.

## Arguments -

<str> This argument contains the string of characters which are to be printed. The string may also contain any of the computer's user-defined characters.

<chr> This specifies the character with which the letters in the string are to be printed. If the <chr> value is a control character value (0 to 31), then each letter of the string will be made up of its own letters, e.g. \*TPRINT HELLO 0 <RETURN> would produce -

```
HH HH EEEEE LL LL 0000
HH HH EE LL LL 00 00
HH HH EE LL LL 00 00
HHHHH EEEEE LL LL 00 00
HH HH EE LL LL 00 00
HH HH EE LL LL 00 00
HH HH EEEEE LLLLL LLLLL 0000
```

(<X,Y>) This specifies the size of the characters. <X> specifies the number of characters to be printed horizontally per pixel of the character. <Y> specifies the number of characters to be printed vertically per pixel of the character. If either of these arguments are omitted the value 1 will be assumed. If both sizes are set to 1, the resulting characters will be 8 times the size of the currently selected printer characters.

<or> (OPTIONAL) This specifies the orientation and direction of the text.  
The value may range from 0 to 7 and relates to the following -

<or>	Orientation	Direction
0 (default)	Normal	Across page
1	90 degrees	Down page.
2	180 degrees	Across page.
3	270 degrees	Down page.
4	90 degrees	Across page.
5	180 degrees	Down page.
6	270 degrees	Across page.
7	Normal	Down page.

<op> (OPTIONAL) This option specifies whether the text is printed normally or in inverse. This argument may range from 0 to 1 and relates to the following:-

0 (default) Normal.  
1 Inverse.

NOTE: Different shades may be obtained by printing the text with a different character, i.e. a dot (CHR\$46) for light and a "@" character (CHR\$64) for dark text. The linespacing may be adjusted and condensed printing used to obtain more compact characters.

```
*LINESPACE 4,216
*STYLE C
VDU 2
*TPRINT "HELLO" 46 3 3
```

Try entering and running this program -

```
10 MODE 0
20 VDU23,255,255,255,255,255,255,255,255,255
30 FOR O%=0 TO 1
40 FOR I%=0 TO 7
50 *TPRINT HELLO 255 1 1 I% O%
60 NEXT: NEXT
```

## **\*ULOAD** <fsp>

Having previously saved a set of user defined characters with \*USAVE, \*ULOAD may be used to load the definitions back into the computer.

NOTE 1: If the error "channel" is given then the file could not be found.

NOTE 2: If a file was not saved using \*USAVE and an attempt is made to load it using \*ULOAD then the error message "Not characters" will be issued.

Argument -

<fsp> This is the filename string.

## **\*UNDERLINE** (<on/off>)

This enables all subsequent text to be underlined.

Argument -

<on/off> (OPTIONAL) This is a string variable. If no argument is given or "ON" is given, then underlining is turned on. Any other string e.g. "OFF", will turn underlining off

\*UNDERLINE ON or \*UNDERLINE will turn underlining on.

## **\*USAVE** <fsp>

User defined characters can be saved on tape or disc by using this command. Only characters that can be defined will be saved, as set by \*FX 20. All the characters will be saved on one file.

Argument -

<fsp> This is the name given to the block of characters i.e. a filename.

# \*WINDOW

Included in the PRINTMASTER is a graphic window defining aid. This command can be used to define a new graphic window on the screen. This is intended for use especially with the graphic screen dump routine (see \*GDUMP). The defining of the window is done by moving a displayed box around the screen to the desired area for the graphic window. At this point the window can either be defined directly from the routine or the attempt can be aborted. The box is initially set to the old screen window area.

The following keys are used to control the positioning of the box for the new window -

<TAB> The box on the screen has two controllable points - the bottom left corner and the top right corner. Only one of these points can be moved at a time. Pressing the <TAB> key will swap control to the opposite corner, i.e. pressing <TAB> once will transfer your control to the opposite point and pressing <TAB> again will restore control to the first corner again, etc.

<Z> or <←> Moves the current corner left.

<X> or <→> Moves the current corner right.

</> or <↓> Moves the current corner down.

<:> or <↑> Moves the current corner up

<SHIFT> Pressing the <SHIFT> key simultaneously with any of the movement keys will make the point move with a larger step, (i.e. faster)

<RETURN> Sets the new screen window to the position of the box. If any part of the box is off the screen, a bleep will sound and the routine will not be terminated since windows cannot include off-screen points.

<ESCAPE> This terminates the attempt to define the window. The original window is restored.

<V> Pressing <V> will cause the actual values of the co-ordinates (that would be needed to define a window indicated by the position of the box) to be printed at the top of the screen. These numbers will disappear as soon as another key is pressed.

This routine will generate the error "Not graphic mode" if an attempt was made to perform the \*WINDOW command in MODES 3,6 & 7.

NOTE: If Computer Concepts' GRAPHICS ROM is fitted this command will not work with rotated and scaled screens.

# \*WVALS

This routine prints the co-ordinates of the current graphic window.

# ERROR MESSAGES

CODE      ERROR MESSAGE AND POSSIBLE REASON.

150 Bad number

An illegal character was given in a numerical argument.

151 Bad string

A string was incorrectly given, e.g. \*STYLE "C

152 Out of range

If a numerical parameter was given that was bigger than the allowed range for that command. This error is also issued from the graphic dumping or string printing routine if numbers have become too large to handle, (i.e. the scale is too big for the window size.)

153 No such variable

An un-assigned string variable was given for a string argument.

154 Too big

A number was entered that was larger than 255 or a string was given longer than 248 characters.

155 Syntax:

This displays the correct syntax for a command if a wrong number of arguments was given.

156 Can't dump file

A file could not be sent to the printer.

157 Not graphic mode

An attempt was made to use the window definer or graphic dumper in an illegal screen mode.

158 Bad character

An illegal character was given in the \*STYLE string.

159 Bad margin

A bad value was given in the \*MARGIN command, e.g. the right margin set less than the left margin.

160 Bad line space

An illegal line spacing was given.

161 Not characters

An attempt was made to \*ULOAD a file that did not consist of user definable characters.

# ARGUMENTS IN ALPHABETICAL ORDER

- <a> </b inches> The printer's line spacing specified as the fraction of an inch a/b.
- <chr> The user definable character being edited or designed in \*DESCCHAR. Not in range 0 to 31 or 127.
- <codes/\$ASCII> One or a series of numbers or, if prefixed by "\$", ASCII characters to be sent to the printer.
- <columns ..> One or several horizontal tab positions. See \*TAB.
- <country> A code for an international character set from 0 to 10. See \*FONT.
- <fsp> A filename string.
- <gap> Insetting of the printing on the page in 1/20ths of an inch.
- <height> The height of the characters. Range 0 to 2.
- <inches/+lines> The paper page length. If a "+" prefix is given, then the page length is set in inches otherwise it will be set as a number of lines.
- <left> The printer's left margin.
- <lines per inch> The printer's line spacing specified as the number of lines to the inch.
- <on/off> A string for turning on or off certain printer functions. If no argument is given or "ON" is given, then the function is turned on. Any other string, e.g. "OFF", turns the function off.
- <op> An option to change the shade or condition of a printer dump.
- <or> The orientation of screen or text dumps in range 0 to 7.
- <right/+width> The printer's right margin. If a "+" prefix is given then the page column width is set.
- <shade> The darkness of the printer's characters from 0 to 3.
- <skip> The paper's perforation skip-over in lines.
- <str> A string of characters usually surrounded by quotes.
- <udc width> -The width of a user definable character when dumped using \*TDUMP. May range from 0 to 9, 0=normal width, 1=double width.
- <width> The printer character width from 0 to 5.
- <X,Y> The width and height of a dump or character in a string.

# EPSON CONTROL CODES SUMMARY

## KEY:-

F	These control codes work on FX printers
M	These control codes work on MX printers
R	These control codes work on RX printers
ALL	These control codes work on all Epson printers

## PRINT MODE-----

ASCII	DEC	MODEL	SUMMARY
SO	14	ALL	Sets enlarged characters (only for current line)
ESC SO	27,14	F R	Sets enlarged characters (until cancelled)
ESC W CHR\$n	27,87,n	ALL	Sets (with n=1 or 49) or cancels (with n=0 or 48) enlarged characters
DC4	20	ALL	Cancels enlarged characters
SI	15	ALL	Sets condensed characters (only for current line)
ESC SI	27,15	F R	Sets condensed characters (until cancelled)
DC2	18	ALL	Cancels condensed characters
ESC !	27,33	F	Selects print style mode
ESC - CHR\$n	27,45,n	ALL	Selects (with n=1 or 49) or cancels (with n=0 or 48) underlining
ESC E	27,69	ALL	Sets emphasised characters
ESC F	27,70	ALL	Cancels emphasised characters
ESC G	27,71	ALL	Sets double-strike characters
ESC H	27,72	ALL	Cancels double-strike characters
ESC M	27,77	F R	Selects elite style characters
ESC P	27,80	F R	Selects normal (pica) style characters
ESC S CHR\$0	27,83,0	ALL	Sets superscript characters
ESC S CHR\$1	27,83,1	ALL	Sets subscript characters
ESC T	27,84	ALL	Cancels ESC S mode character
ESC p CHR\$n	27,112,n	F	Sets (with n=1 or 49) or resets (with n=0 or 48) proportionally spaced characters.

## LINE SPACING-----

ESC 0	27,48	ALL	Sets spacing to 1/8 inch
ESC 1	27,49	ALL	Sets spacing to 7/72 inch
ESC 2	27,50	ALL	Sets spacing to 1/6 inch
ESC 3 CHR\$n	27,51,n	ALL	Sets spacing to n/216 inch, where the unit n = 1/3 dot (n = 0-255 incl.)
ESC A CHR\$n	27,65,n	ALL	Sets spacing to n/72 inch ( n = 0-85 incl.)

PAPER FEED EXECUTION-----

ASCII	DEC	MODEL	SUMMARY
LF	10	ALL	Single line feed
FF	12	ALL	Feeds to beginning of next form
CR	13	ALL	Carriage return
ESC J CHR\$n	27,74,n	ALL	Executes a n/216 inch paper feed ( n = 0-255 incl.)
ESC N CHR\$n	27,78,n	ALL	Sets the number of lines to skip-over the perforation to n ( n = 1-127 incl.)
ESC O	27,79	ALL	Cancel skip-over perforation set by ESC N
ESC j CHR\$n	27,106,n	F	Reverse feed of n/216 inch

FORMAT CONTROL-----

BS	8	ALL	Backspace - Prints and backs by 1 character
HT	9 or 137	ALL	TABs horizontally to next TAB position
VT	11	ALL	Line feeds to next vertical TAB position
ESC / CHR\$n	27,47,n	F	Selects the vertical format unit for consequent Vertical Tabs
ESC B ...	27,66...	ALL	Sets the vertical TAB positions
ESC C CHR\$n	27,67,n	ALL	Sets form length to n lines
ESC C O CHR\$n	27,67,0,n	ALL	Sets form length to n inches
ESC D ...	27,68...	F M	Sets the horizontal TAB positions
ESC Q CHR\$n	27,81,n	ALL	Sets column length (right margin)
ESC b ...	27,98...	F	Sets VFU positions
ESC e ...	27,101...	R	Sets horizontal/vertical TAB unit
ESC f ...	27,102...	R	Sets horizontal/vertical skip position
ESC l CHR\$n	27,108,n	F R	Sets the left margin

INPUT DATA CONTROL-----

CAN	24	F	Cancel all data already input on that line
DC1	17	F	This enables the printer to receive data
DC3	18	F	This disables the printer
DEL	127	ALL	The last character is deleted
ESC 6	27,54	F	Expands the printable code area
ESC 7	27,55	F	Cancel ESC 6
ESC =	27,61	F	Sets the MSB of 8-bit data to 0
ESC >	27,62	F	Sets the MSB of 8-bit data to 1
ESC	27,124	F	Cancel ESC = and ESC >
ESC I CHR\$n	27,73,n	F	Selects printable/control codes

CHARACTER SETS-----

ASCII	DEC	MODEL	SUMMARY
ESC 4	27,52	F R	Selects alternate mode / italic characters
ESC 5	27,53	F R	De-selects alternate mode / italic characters
ESC &	27,38	F	Defines characters (see manual)
ESC % ...	27,37...	F	Selects character set
ESC : ...	27,58...	F	Copies ROM character set to download set
ESC R CHR\$n	27,82,n	ALL	Selects international character set
ESC m CHR\$n	27,109,n	R	Selects special character generator

MISCELLANEOUS-----

BEL	7	ALL	Sounds buzzer
ESC 8	27,56	ALL	Disables paper-end detector
ESC 9	27,57	ALL	Enables paper-end detector
ESC <	27,60	F R	Prints from left
ESC @	27,64	ALL	Initialises printer
ESC U CHR\$n	27,85,n	ALL	Sets uni-directional printing with n=1 or 49 Sets bi-directional printing with n=0 or 48
ESC i CHR\$n	27,105,n	F	Sets or cancels incremental mode
ESC s CHR\$n	27,115,n	F R	Selects print speed

BIT IMAGE GRAPHICS-----

ESC * ...	27,42...	F R	Sets 8-bit graphic mode
ESC ↑ ...	27,94...	F	Sets 9-bit mode
ESC K ...	27,75...	ALL	Normal density, 8-bit
ESC L ...	27,76...	ALL	Dual density, 8-bit
ESC Y ...	27,89...	F R	Double speed, dual density 8-bit
ESC Z ...	27,90...	F R	Quad density, 8-bit



