

## **Kempston Centronics Interface E**

2004 OCR'd by Wilko Schröter

# **KEMPSTON CENTRONICS INTERFACE E**

## **INTRODUCTION**

The Kempston Centronics Interface E is designed to allow a full size printer to be attached to the Spectrum. The interface has a built in EPROM which allows the commands LLIST, LPRINT and COPY to be understood by the particular printer being used in standard Centronics protocol.

There are a few extra functions which you should be aware of before attempting any home programming. They will be detailed later.

## **CONNECTING THE INTERFACE**

The interface should be plugged into the expansion port at the back of the Spectrum BEFORE applying the power.

**Do not attempt to insert or remove the interface whilst the power is on otherwise permanent damage might occur to both the interface and the Spectrum.**

The cable terminates with a 36 way plug which is the right type for most Centronics compatible printers. We particularly recommend the following:-

EPSON MX80, RX80, FX80  
STAR DP510, SHINWA JP-80  
SEIKOSHA GP80, GP100, GP250  
QUEN-DATA DP 100  
MICROLINE 80

Although the interface is compatible with a much larger range, high resolution screen copy is only possible with the above list.

When you switch on, the interface is automatically set up with the following features.

Text copy, meaning that when you type COPY, only the letters and numbers will be printed, no graphic characters will be passed to the printer.

No Line Feed is given after Carriage Return. Most printers will automatically feed the paper forward one line before printing the next. However some printers are supplied with an internal switch to let the user decide whether he wants line feed or not. If this is so then it is likely there will be no line feed and you will need to set Line Feed from the internal switch or from the interface. (see text later)

The number of characters printed per line is set to 80. To alter the number of characters printed per line, simply POKE location 23679 with the required number. e.g. For a column width of 32 characters type

```
POKE 23679,32 ENTER
```

To check on the current status of the interface type

```
COPY : REM ? ENTER
```

This results in the following line being displayed.

```
CR *TOKENS ON* *=*TEXT * 80
```

This line is called the Status line and this gives the current settings of the interface ROM software.

Each feature of the interface is separated by '\*'.  
The first 'CR \*' represents Carriage Return and no Line Feed. To tell the printer to feed paper out after a line is printed, type

```
COPY : REM / 1
```

This will be represented by 'CR+LF\*', To turn off the Line Feed type

```
COPY : REM / 0
```

returning the status line to 'CR \*'.

The second feature is '\*TOKENS ON\*'. Tokens are the single byte form that Sinclair use to represent keywords and Spectrum graphics, e. g. token number 230 or CHR\$ 230, is the keyword 'NEW '. With tokens on, LPRINT CHR\$ 230 will result in 'NEW ' being printed on the printer.

To access the printer's own graphics or alternative character sets you need to turn off the tokens, as the interface will trap the code and convert it into a keyword or Sinclair graphic. This holds for any code below 32 or above 127. This is done by typing

```
COPY : REM CHR$ 0
```

resulting in the status line changing to '\*TOKENS OFF\*'.  
This then allows you to send direct codes to the printer. Using the above example, LPRINT CHR\$ 230 will print an italic 'f' on many printers. See also the text on ESC codes.

To turn them on again type

```
COPY : REM CHR$ 1
```

Next we find the ESC codes flag, usually turned off denoted by '\* \*'. ESC or escape codes are the control codes used by the printer to decide which type of print style is used or the distance between each line or to set the size of your page and the place where you start printing. Your printer manual will tell you which codes do what and also how to use them.

For example, on an EPSON type printer, ESC E is the code used to set emphasised printing. The printer manual tells you how to do this. LPRINT CHR\$ 27; "E"; followed by any text will print that text in emphasised format.

The 'CHR\$ 27;' is the ESC part of the ESC code. The Spectrum is not equipped with an ESCAPE key as some computers are so you will need to tell the interface that the next codes you are going to send will be ESC codes. To do this you have to turn on the ESC flag by simply LPRINT CHR\$ 27; . The status line can then be seen to change to '\*ESC\*'. Any control code can then be sent in the form given in the printer manual.

Effectively what you do is, for example, to set emphasised print, LPRINT CHR\$ 27; CHR\$ 27; "E" ; . The first 'CHR\$ 27;' turns on the ESC flag allowing the complete control code to be passed to the printer.

If the control code you want has any characters below 32 then it is important that you turn off the tokens as instructed above otherwise the code will be ignored and only the printable characters will be printed instead. Also if you turn off the tokens, you need not send an extra CHR\$ 27; in front of the ESC code.

i. e. COPY : REM CHR\$ 0 followed by LPRINT CHR\$ 27 ; "E" ; will set emphasised printing.

If more than one code is to be used in one line, remember to insert the extra 'CHR\$ 27;' before the ESC of the control code.

The next feature is the setting for the size of the picture produced by COPY using one of those printers specified. Normally it is set to single size denoted by '\*=\*'. If you want an enlarged high resolution COPY on a specified printer you can type

```
COPY : REM ↑ 1
```

This command changes the status line to '\*↑\*'. To reset the COPY size to single, type

```
COPY : REM ↑ 0
```

The next section shows the type of printer the interface expects to see plugged in. When you switch on, the interface will be in text mode, shown on the status line by '\*TEXT\*'.  
In this mode, LPRINT, LLIST, and COPY will produce output onto any Centronics type printer, but will not print any graphics or copy the screen in high resolution.

If you have one of the above printers then you have available an option to print graphics in LLIST or LPRINT statements and to get a high resolution copy of the screen. You must first select the printer by typing one of the following commands.

For an EPSON MX80, RX80 or FX80 type

```
COPY : REM = # ENTER
```

(Use the same setting for any Epson compatible printer such as SHINWA, BROTHER HR 5, QUEN-DATA etc.)

For a SEIKOSHA GP80 or GP100 type

```
COPY : REM= * ENTER
```

For a SEIKOSHA GP250 type

```
COPY : REM = & ENTER
```

For a MICROLINE 80 type

```
COPY : REM = @ ENTER
```

(Note that due to the graphic printing routines of this printer only enlarged size COPY is available.)

To go back to TEXT mode type

```
COPY : REM = ENTER
```

These settings are represented by '\*EPSON\*', '\*SE100\*', '\*SE250\*', '\*ML80\*' and '\*TEXT\*' respectively.

There is available an alternative ROM containing a high resolution colour COPY routine for the SEIKOSHA GP 700.

If you have this version, follow instructions for SEIKOSHA GP100 printers, i. e. for SEIKOSHA GP 700 type

```
COPY : REM = *
```

The other settings for this ROM are '\*TEXT\*' and '\*EPSON\*'.

The final part of the status line tells you the number of characters that will be printed per line on the printer. Normally set to 80, this can be changed to any number in the range 32 to 128 by

```
POKE 23679,n
```

(n = the number required)

## NOTES

### Your own programs

You have seen how most of the commands take the format

```
COPY : REM (command)
```

You can use these in Command mode on the Spectrum, i.e. when there is a flashing 'K' cursor in the bottom two lines of the screen. After entering a command, the status line is displayed to confirm it. Press SPACE to continue.

You can also use the same commands from within programs simply by giving them individual line numbers. The status line will not be displayed in this case to avoid interrupting the program.

### 2. Tasword II

Before loading Tasword switch off tokens by

```
COPY : REM CHRS 0
```

After loading TASWORD use the g option to change the graphics/printer options as follows.

```
Code 1 : 0  
Code 2 : 0  
Code 3 : 0  
Code 4 : 57855
```

Carriage return set to 13

Line Feed set to 0 or 10 according to your printer.

### 3. Omnicalc 2

No changes are required, contrary to the instructions given. Simply set up the interface to suit the printer used before LOADING "om 2" from the tape.

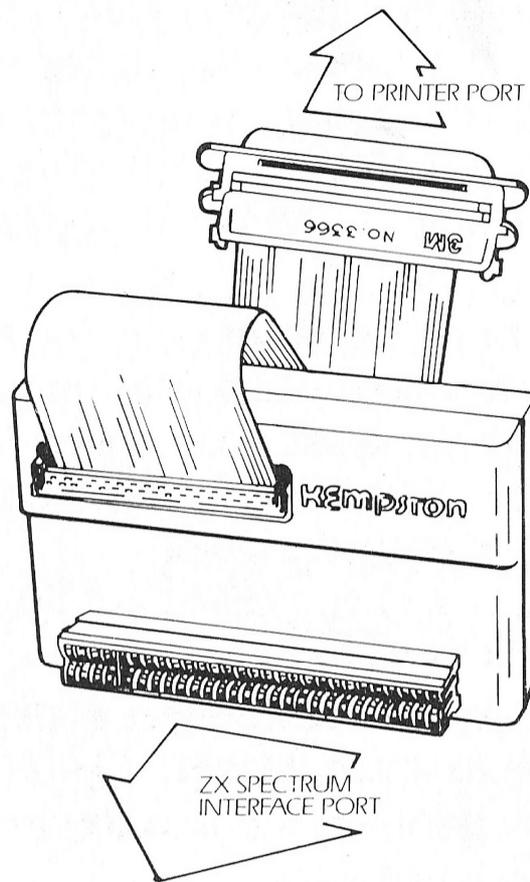
### 4. Other commercial programs

The interface is compatible with software which uses either BASIC COPY or LPRINT to generate printer output and as such most commercial software will work without alteration.

5. If you have any queries regarding applications of the interface, please write to us at the following address:-

Technical Queries, Kempston Micro Electronics Ltd, Unit 30  
Singer Way, Woburn Road Industrial Estate, Kempston,  
Bedford MK42 7AF.

Telephone (0234) 852997 after 1.30 p. m. Monday to Friday.



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