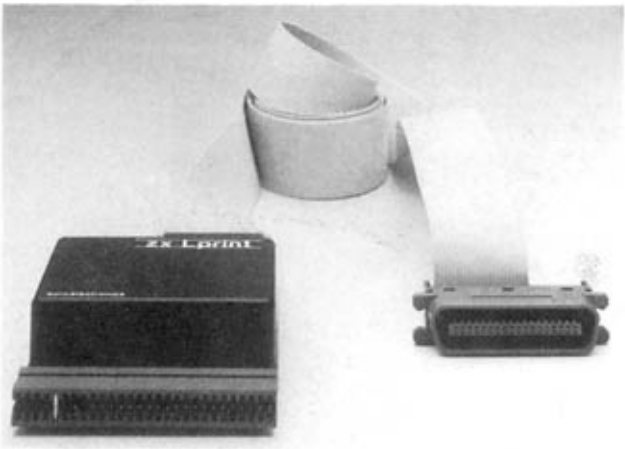
Interface for ZX Spectrum



- Centronics and RS 232 in one unit
- LPRINT, LLIST and COPY
- No extra software needed
- Microdrive compatible
- COPY in colour

ZX LPRINT III

WORD PROCESSING ● HIGH RESOLUTION GRAPHICS PRINTING ● SPREAD SHEET PRINTOUT
ADDRESS LABLES AND ENVELOPES ● CORRESPONDENCE ● PROGRAM LISTINGS

No tapes, no fuss interface to connect your ZX Spectrum to a vast selection of business printers with either Centronics or RS 232 input. Dot matrix or daisywheel, single or multi colour. No extra software is needed to print a high resolution copy of a screen on a number of popular printers. ZX Lprint III has built in routines for high resolution COPY for:

Seikosha GP100A and GP250X ● Epson (most hi-res models) ● Star DP510, DP515 and STX80 ● Star Gemini and Star Delta ● Walters WM80 Shinwa and CTI and... Seikosha GP700 screen COPY in FULL COLOUR.

Options: ● Four colour plotters ● Microline 80 & 82.

Copy routines include user defined graphics and Spectrum block graphics. TEXT COPY on most printers (including daisywheels) copies alphanumeric characters from screen to paper.

Other printers than those listed above are also suitable for printing, listing and word processing provided they have standard Centronics or RS 232 interface. ZX Lprint is fully compatible with Microdrives and most of the popular software (e.g. Tasword 2, Viewfile, Kemp Business Accounts etc). Compatibility with Prestel adaptor allows copies of Prestel pages to be printed.

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courtesy of kio@little-bat.de

RS 232 Operation

When first switched on ZX LPRINT III is ready for Parallel operation. Basic Command LPRINT CHR$ 0;''S''; changes over from Parallel output to serial RS 232 output. (To return to Parallel operation use command LPRINT CHR$ 0; 'P';).RS 232 mode has one start, two stop bits and no parity check.

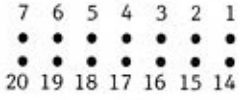
Baud Rate

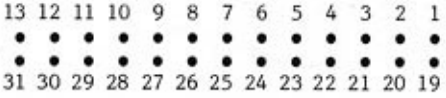
Default is 1200. Other Baud rates are selected by poking an addresses as shown below:

Baud Rate	POKE 23728,
75	1
110	2
150	3
300	4
600	5
1200	6
2400	7
4800	8
9600	9

Connections

RS 232 output is via the pins of the 14 way connector and Parallel output is via the 26 way connector at the rear of the interface. The connections are shown in the top view diagram below:





Serial Connections:
Pin 1,7.....GND (OV)
Pin 2.....Unused
Pin 3.....TX (TTL)
Pin 4,19,20...CTS,BUSY
(TTL to +/-12V)
Pin 5.....Unused
Pins 14-17....Unused
Pin 18..... +5V

Parallel Connections:
Pin 1.....Strobe (inverse logic)
Pin 2 to 9.... Data 1 to 8
Pin 10.....Unused
Pin 11.....Busy
Pin 12 & 13....Unused
Pin 19 to 30...GND (OV)
Pin 31.....Unused

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TEXT MODE

In this mode ZX Lprint III can produce screen COPY of printable ASCII characters on any suitable printer (including daisywheels). The built-in software recognizes COPY command and scans the display. It ignores graphics and prints alphanumeric characters. This feature is particularly useful for copies of spreadsheets etc. Please note that the pound sign in Sinclair character set does not coincide with standard ASCII set and will probably print as ' while 'hash' sign will print pound sign on most printers.

Operation

A simple programme for text printing is shown below:

```
10 INPUT A$
20 LPRINT A$
30 GOTO 10
```

First initialize the interface (if not already done) and key in the above programme. LLIST command should list the programme to the printer. If the printing repeats on the same line your printer requires an extra line feed after carriage return (CR + LF). This can be achieved as shown above (LPRINT CHR$ 3) or by switching automatic LF switch on at the printer. If the above gives an extra line between each printed line the automatic LF switch must be switched off or a command LPRINT CHR$ 2 must be sent to the interface. Running the above programme gives the simplest form of text printing where one printed line may be edited at a time.
More sophisticated word processing programmes for use with ZX Lprint exist and some can give 64 characters per line on the screen as well as on the printed line, e.g. Tasword 2.

Various printer functions may be controlled from the computer by means of Control Characters. These can be sent to the printer inside an LPRINT command. E.g. enlarged print on Seikosha GP100A is:

```
LPRINT CHR$ 14;
```

To send the above control character to the printer use the following form:

```
LPRINT CHR$ 4; CHR$ 14
```

(CHR$ 4 is ZX Lprint control character which tells the interface to interpret the next character to follow as a printer control code - see above). For printer control codes refer to printer handbook. Control codes which are shown in hexadecimal code must be converted to decimal before they can be used in an LPRINT command.

IMPORTANT: Some machine code programmes for Spectrum computer do not allow the user to return to BASIC once loaded. It is therefore necessary to initialize the interface and to select the required printer type including all control functions (such as CR + LF) before loading such software.

Tasword 2

ZX Lprint III should be initialized (LPRINT ENTER) and Sinclair tokens switched off (LPRINT CHR$ 5 ENTER) or in one command line (LPRINT '; CHR$ 5 ENTER) Alternatively Tasword 2 Basic programme may be altered to innitialize the interface automatically as follows:

- Load Tasword 2 and use STOP command to obtain menu
- Answer B to enter Basic and EDIT line 15
- Insert after number 15 LPRINT '; CHR$ 5;:
- RUN and SAVE the modified version

Tasword 2 interface control codes for ZX LPRINT III are 0,0,0,57855.

ZX LPRINT (Mk III)

Operating Instructions. (Eprom iss.2.0)

ZX Lprint III printer interface may be used with 16k or 48k ZX Spectrum computer to print on printers which have Parallel Input Interface known as Centronics or Serial Input Interface known as RS 232 (5V).

A cable supplied with ZX Lprint is suitable for connecting to most parallel printers with a 36 way input connector. Optional RS 232 cable is available. Power input to computer and printer must be disconnected before inserting this unit and its cables in position. When connected to ZX Lprint the cable must be facing away from the box. Forcing the cable over the box would almost certainly result in damage to the printer when switched on.

Having checked connections between ZX Lprint and the printer turn printer power on. Then connect power lead to ZX Spectrum. When powered the computer with the interface attached should display Sinclair copyright message. All functions should work normally, including the operation of Microdrives and Sinclair Interface 1 (if attached).

Initialization

On power up ZX Lprint III interface must be initialized by a Carriage Return (CHR$ 13). This is done by a command LPRINT (ENTER) or by an LPRINT line in Basic programme. On initialization ZX Lprint III automaticaly selects TEXT mode (see below) and sets the printed line width to 80 characters.
To select a particular graphics printer the following commands are used:

1. Seikosha GP 250X..... LPRINT CHR$ 0;CHR$ 1
2. Seikosha GP 100A..... LPRINT CHR$ 0;CHR$ 2
3. Epson (most hi-res models), Star DP510, Gemini & STX80..... LPRINT CHR$ 0;CHR$ 3
4. Walters WM80, Shinwa & CTI CP80..... LPRINT CHR$ 0;CHR$ 4
5. As in 3. above but small copy..... LPRINT CHR$ 0;CHR$ 5
6. Seikosha GP 700 (in COLOUR)..... LPRINT CHR$ 0;CHR$ 6
7. To select TEXT mode..... LPRINT CHR$ 0;CHR$ 0

Any one of the above commands displays a selection line at the bottom of the screen. Depressing SPACE advances the selection to next printer type. To confirm selection depress ENTER key. (It is not necessary to select any of the above options if text printing only is required).

Interface Control Commands

LPRINT CHR$ 3	This will give a line feed after each carriage return (CR + LF).
LPRINT CHR$ 2	Carriage return only (CR)
LPRINT CHR$ 1;''A''	A can be a number from 1 to 8. This tells the system how many characters received after this command will be interpreted by the printer as control characters.
LPRINT CHR$ 4	As above but only one character following this command will be interpreted as a control character.
LPRINT CHR$ 5	Sinclair tokens off. I.e. all characters following this command will be interpreted as ASCII. To return back to Sinclair tokens use COPY command.
POKE 23679,n	Sets the number of characters (n) per printed line. May be set to 32 or any number from 34 to the maximum allowed by the printer. Default is 80.