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games and utilities are to be released soon.

The interface stimulates the number keys 1 to 5 for the first joystick and 6 to 0 for the second; the order being LEFT, RIGHT, DOWN, UP and FIRE. However the documentation recommends using IN61438 and IN61486 in preference to INKEY. Our review interface was generally well-constructed in all but the edge connectors; these will be improved in the production models. The plug in ROM cartridges are neat little packages, very small and protected by a layer of rubber which is pushed out of the way on connection. At £14.95 these cartridges are not cheap and demand may be limited but the titles are good and many more are promised including some programs not available on tape.

Because the plug-in ROM is separate from the computer's RAM, a game which requires 48K on tape will run on a 16K Spectrum with the interface 2. This may allow much more complicated programs to be written using all the 48K or the machine's RAM. The interface is a worthwhile add on giving scope for increasing the power of the Spectrum at a typically low Sinclair price. However, I feel that the ROM cartridges are expensive and this may be a factor restricting most of us from taking advantage of this neat package.

The interface is available from Sinclair dealers nationwide or telephone **0223 353204** for stockists.

ORIC COLOUR PRINTER/PLOTTER MCP40

**Manufacturer: Oric Products
International**

Price: £169.95 (see also below)

The first of Oric's long promised peripherals are finally becoming available and it looks as if the Company is at last beginning to improve in terms of reliability of delivery.

The first peripheral to have reached production is the four colour

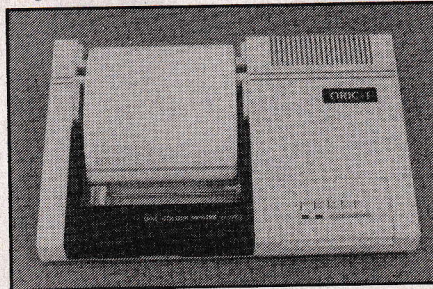
printer/plotter. The idea is not new, Tandy have had a similar machine on the market for years and other manufacturers are just beginning to realise its potential with Atari and Commodore bringing out similar models. The actual mechanism of the MCP40 is similar to that of the Sharp MZ700 machine.

Dashing Design

Externally, the plotter is very smart and finished in colours to match the Oric 1. An on/off switch is situated on the side (useful since the machine plugs directly into the mains) and buttons on the top control line feed, colour select and pen change. LEDs serve as POWER ON and PAPER END indicators. Connection to the Oric micro is by a narrow centronics parallel cable. The whole unit is neat and has a very professional and sophisticated look about it.

Feeding paper into the rollers is simplicity itself. Just present the straight edge of the paper to the roller, lift the lid above the pen drum and hold down the line feed button for the paper to feed in all by itself. It is necessary to lift the lid when switching on to prevent the self test from drawing on the roller. There are two self tests built into the MCP40, the first is triggered by switching on and draws four 1cm squares, one in each colour which is useful for getting the ink flowing in the pens. The other is a full printout of the character set and is triggered in the usual way by holding down line feed when switching on.

Being such a flexible gadget, the MCP 40 has a wide range of commands which are all sent from BASIC using LPRINT. These commands can be divided roughly into graphic and text commands and can be switched using LPRINT CHR\$(17) to get into the text mode and LPRINT CHR\$(18) for the graphic mode. The text command allows you to print in various size characters, in



four directions and in all four colours.

The graphic commands are much more powerful and give control over line type from solid lines to dots

with short and long dashes between. You can draw and move to absolute and relative positions over a width of 480 steps and to a depth of 999 steps. The only 'macro' command similar to those found on larger, more expensive plotters, is one to set up and draw the axis. The origin can be moved so that negative x coordinates can be used as well as negative y coordinates. Printing usually resets the head to the beginning of the line so that you have a print in graphic mode option which allows you to mix graphics and text more easily.

Flaws

Two flaws mar the overall brilliance of this product. The first is the unreliability of the cut down centronics port which results in spurious data being sent. This is not so bad in a listing job (you can always re-list and get a correct listing for that section), but on a large complicated plot (such as a graphic design), one point out of place will spoil the whole pattern which may have taken ages to build up.

The second major fault is in the documentation. The plotter/printer is a complex product, probably being used by beginners to computing, who need to be taken step by step through the way it works. Examples would be a help. The 32 page Operation Manual skimps on detail, particularly on points of syntax where things can go wrong. There are no details on how to use variables which is something the MCP40 is very fussy about. LPRINT "D100,100" is valid, as is LPRINT "D100, 100" but A\$ = "D100," + STR\$(100) is not valid — you have to strip leading spaces from concatenated strings. However, once this is realised, you can generate some wonderful patterns and a huge paper bill.

Conclusions

The MCP40 is a nice toy. It cannot be considered as an alternative to a dot matrix printer unless the print loads are light and the operator has a lot of patience. The print speed of 12 cps is very slow, but the print quality and the choice of 40 or 80 character width, along with its neatness make the MCP40 a very attractive buy. Oric are currently increasing its appeal by knocking £40 off the price when bought in conjunction with the 16K Oric 1 home computer by mail order from **Tansoft, Units 1&2, Techno Park, Newmarket Rd, Cambridge.**

ORIC 1

Oric Products International,
Coworth
Mansion,
Coworth Park,
London Road,
Sunninghill, Ascot,
Berkshire, SL5 7SE.



STANDARD PACKAGE

Memory Size (RAM)	16K, 48K
Screen Size	28 X 40
Expansion Sockets	Yes
Tape Included?	No
Display Unit Included?	No
Usable Domestic TV?	Yes
Size of BASIC	8K
Average Price	£99.95, £139.95

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	N/A	—
Printer	TBA	—
Monitor	No	—
Disc Drives	TBA	—
Other Languages	N/A	—
Multi-user Capabilities	No	—
BASIC extensions (Toolkits)	TBA	—

OTHER ADD-ONS:

None Reported

SHARP MZ-80A

Sharp UK Ltd,
Thorn Road,
Newton Heath,
Manchester
M10 9BE
Tel: 061-205 2333



STANDARD PACKAGE

Memory Size (RAM)	48K
Screen Size	25 lines of 40 characters
Expansion Sockets	BUS connector
Tape Included?	Yes
Display Unit Included?	Yes
Usable Domestic TV?	No
Size of BASIC	12K
Average Price	£549

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	No	—
Printer	Yes	£450-800
Monitor	N/A	—
Disc Drives	Yes, dual	£600
Other Languages	Yes	£45
Multi-user Capabilities	No	—
BASIC extensions (Toolkits)	No	—

OTHER ADD-ONS:

None Reported

SHARP MZ-80K

Sharp UK Ltd,
Thorn Road,
Newton Heath,
Manchester
M10 9BE



STANDARD PACKAGE

Memory Size (RAM)	48K
Screen Size	25 lines of 40 characters
Expansion Sockets	BUS connector
Tape Included?	Yes
Display Unit Included?	Yes
Usable Domestic TV?	No
Size of BASIC	12K
Average Price	£350

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	No	—
Printer	Yes	£450-800
Monitor	N/A	—
Disc Drives	Yes, dual	£600
Other Languages	Yes	£45 upwards
Multi-user Capabilities	No	—
BASIC extensions (Toolkits)	No	—

OTHER ADD-ONS:

None Reported

SINCLAIR ZX 81

Sinclair Research,
6 Kings Parade,
Cambridge CB2 1SN



STANDARD PACKAGE

Memory Size (RAM)	1K
Screen Size	24 lines of 32 characters
Expansion Sockets	BUS connections
Tape Included?	Yes
Display Unit Included?	No
Usable Domestic TV?	Yes
Size of BASIC	8K
Average Price	£49.95 built

MANUFACTURER'S EXPANSIONS

	DETAILS	PRICE
RAM	16K RAM pack	£29.95
Printer	ZX Printer	£59.95
Monitor	No	—
Disc Drives	No	—
Other Languages	No	—
Multi-user Capabilities	No	—
BASIC extensions (Toolkits)	No	—

OTHER ADD-ONS:

Memory expansion unit 16K or 64K, Memotech Ltd, 3 Collins St, Oxford OX4 1XL, £39.95-79; Memory Expansion 64K, Downsway Electronics (UK) Ltd, Dept M, Downsway House, Epsom Road, Ashted, Surrey; £59.95; **Key Bleep Unit**, Microtronix, 3 Buxton Avenue, Coultan, Nottingham, N94 3RR, £8.85 kit, £9.95 built; **Maximem 1.1**, East London Robotics, Finlandia House, 14 Darwell Close, East Ham, London, E84 BT, £93.50; **Music Synthesiser + 16 line control port**, William Stuart Systems Ltd, Dower House, Billicicay Road, Herongate, Brentwood, Essex CM13 3SD, £19.50; **Full-size keyboard**, Protos Computer Systems, Frome Computing, 20 Ashtree Road, Frome, Somerset, BA11 2SF, £64.95; **ZX99 Automatic tape control**, Data-cassette, 44, Shroton Street, London NW1 6UG, £59.95.

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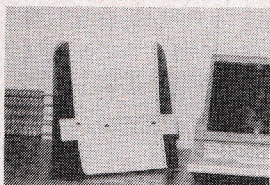
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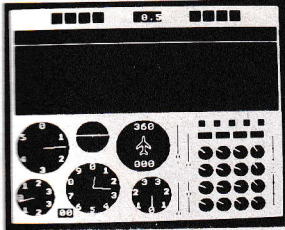
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