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ASC	MVD		NEXT	WAIT	PLOT	CRD
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Computing Today is constantly on the look-out for well written articles and programs. If you think that your efforts meet our standards, please feel free to submit your work to us for consideration.

All material should be typed. Any programs submitted must be listed (cassette tapes and discs will not be accepted) and should be accompanied by sufficient documentation to enable their implementation. Please enclose an SAE if you want your manuscript returned, all submissions will be acknowledged. Any published work will be paid for.

All work for consideration should be sent to the Editor at our Charing Cross Road address.

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145 Charing Cross Road, London WC2H 0EE.
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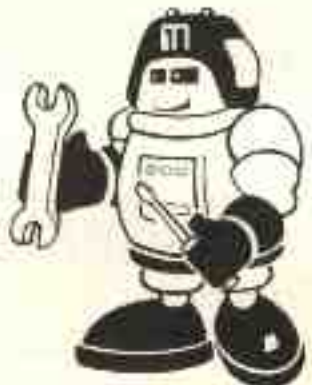
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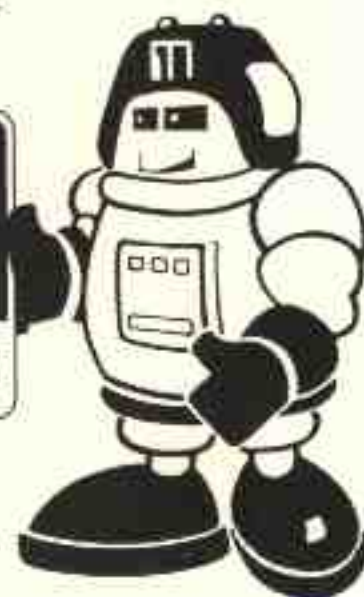
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KEY

B = Business, G = Games, L = Library
K = Kuma, W = Watkiss Computers

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CONSUMER NEWS



CONSOLING THE SPECTRUM

You know what it's like when you have your micro, cassette recorder, printer and an assortment of other necessary 'bits and pieces' lying around on your desk and they're in such a state of 'professional disarray' that you can't even find your pen! Well in an attempt to help us all be tidy minded TTL have produced a ZX Spectrum desk console. The console comes ready assembled and can accommodate the following: the ZX Spectrum, the power unit, Sinclair printer, RS232 interlace, joystick control, two Microdrives, a cassette recorder, cassettes and pencils.

The price is £42.18 including VAT and postage and packing and can be obtained from Traffic Technology Limited, PO Box 2, Warminster, Wiltshire BA12 7QX.

BUG BYTES

Well it's time for the Editor to don his sackcloth and ashes garb, because it's time for us to inform you of errors that have appeared recently in issues of *Computing Today* and *Personal Software*. In the February issue of *Computing Today* an error appeared in the article called Tailoring VIC Characters. Please note for Listing 1:

Line 70: There is a missing " after the REV and before the;
Line 410: Should read POKE PP,4:POKE CP,0
Line 540: Should read POKE PP,RM:POKE CP,CM

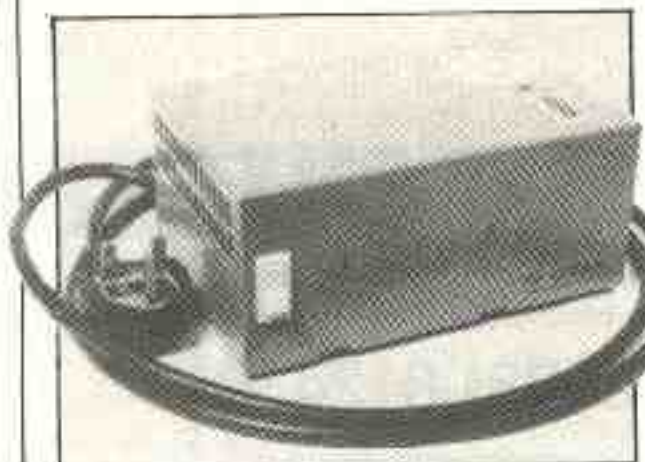
In the Spring issue of *Personal Software* an error appeared in the article called Hints and Tips. Please note that for Listing 1 line 190 should read:

190 .FIX1 PHA:JSR &F521:PLA:RTS

We apologise to all of you who have had problems with these programs but we hope we have now shed some light on the matter.

POWERFUL PROTECTOR

Computers can be quite sensitive animals particularly where their power is concerned. Well we can now give a plug (sorry about that!) to a line conditioner which is



specifically designed to protect home computers from malfunctions caused by power line noise and mains variations.

The Mainstay can provide an output that is stable within $\pm 6\%$ even if the input voltage drops to 75% of normal. The price of the unit is £49.95 excluding VAT. You can get more information by writing to Gould Electronic Power Conversion Division, Rhosymedre, Wrexham, Clwyd LL14 3YR.

FARSEEING COMPANY

COLVIS is a solid state camera connected to a powerful microcomputer which is capable of 'seeing' an object and remembering its shape. The information is composed of a range of parameters such as area, perimeter and centre of gravity of the image. The system can be used with any microcomputer which has or can be fitted with an 8-bit bidirectional port. The system is aimed at the educational market and constitutes an invaluable low cost peripheral to existing robotic arms.

COLVIS is priced at £395 and you can get more details by writing to Colne Robotics Company Ltd, Beaufort Road, Off Richmond Road, East Twickenham, Middlesex TW1 2PQ or by phoning 01-892 8197.

REDUCING POCKET COMPUTERS

The volume of demand and high factory production rates are allowing Casio to reduce the prices of their FX 700P and PB 100 pocket computers. The new recommended retail prices, complete with comprehensive guides, manuals and program libraries are £69.95 for the FX 700P and £59.95 for the PB100.

For details of these and other Casio products, contact Casio Electronics Company Ltd, Unit 6, 1000 North Circular Road, London NW2 7JD or phone 01-450 9131.

RAMS ARE CAMEL'S

A 4K version of the earlier 2K MEMIC L CMOS RAM unit is now available. The unit uses the latest True CMOS static RAMs which take only a fraction of a μA of current to retain data, this standby power being supplied by an integral lithium battery for 10 years or so. The unit comes in a moulded black ABS case and is priced at £35.95 plus VAT. For more details,

you should contact Cambridge Microelectronics Ltd, One Milton Road, Cambridge CB4 1UY.

Some of you may remember the item we ran in this column in the January issue of *Computing Today* when we reported the 2K CMOS RAM unit and asked you to scrutinise the photo published and tell us into which computer the unit was plugged. Well the response to that little quiz was so good we've decided to test you even further and ask you again to tell us which computer the unit is plugged into. The first correct answer pulled from the Editor's cardboard box (his hat somehow got mislaid!) will receive the MEMIC L2 as their prize, kindly donated by those sporting people at Cambridge Microelectronics. All entries should be received by May 9 either on the back of a sealed envelope or on a postcard please.



STICKING WITH IT

A simple plug-in joystick for the ZX Spectrum is now available. With eight direction commands and two large fire buttons, high speed games can now be played at ease. Six games are presently available for use with joysticks with more on the way.

The joystick is priced at £25.00 plus postage and packing. For more information, please contact Kempston (Micro) Electronics, 180a Bedford Road, Kempston, Bedford MK42 8BL.

IT'S TI AGAIN

Texas Instruments have announced a cheap 16-bit computer, the TI-99/2, which they claim is designed to allow computer novices to learn to program a computer in TI BASIC and BASIC supported assembly language. The machine is targeted primarily at the technical enthusiast, engineer or student in the home.

The machine has a QWERTY style keyboard, with 4.2K RAM, of which 4K is user accessible and which can be expanded to 36.2K. Any TI peripherals can be connected; two software cartridges, Learn to Program and Learn to



program BASIC, will be available initially for the unit, with more planned for later. Twenty programs will also be initially available on cassettes including educational, personal management and entertainment cassettes, all of which will also run on the TI-99/4A computer.

The bad news is however that the TI-99/2 will not be available in the UK until the third quarter of 1983, but it may well be worth waiting for as it is priced at just £75. More information can be obtained from Texas Instruments Limited, Manton Lane, Bedford MK41 7PA or by phoning 0234-67466.

MANCHESTER HOME COMPUTER SHOW

April 21, 22 and 23 will see the first Manchester Home Computer Show at the Midland Hotel. On show will be a complete cross section of hardware and software available for the home user with emphasis on the lower end of the market featuring computers from £50.00 to £400. There will be a Computer Advice Centre at the exhibition where the uninitiated can try out machines in a demonstration area, and see programs in operation covering educational, games and small business applications with a team of experts on hand to provide impartial advice.

Two home computers will be given away in the show competition, entry forms for which are available with advance tickets or with show guide on all three days. Advance tickets are £1.00 from the organisers, Manchester Home Computer Show, ASP Ltd, 145 Charing Cross Road, London WC2H 0EE. Children under eight

and OAPs have free entrance and there is a 25% discount on groups of 20 or more.

BRIEFING

From Pete & Pam comes **Track Ball**, a new omnidirectional guidance system designed for games requiring rapid paced, multiple movement commands. Two firing buttons are recessed well below the ball control place for easy firing and unobstructed movement during game play. Track Ball comes in models to fit the Atari, Apple and IBM personal computers, and is priced at £45.95. More details can be obtained from **Pete & Pam Computers**, New Hall Hey Road, Rossendale, Lancashire BB4 6JG, or phone 0706-227011.

HI-STAK can make your micro easier to use by raising the back to a calculated level. It can be instantly applied and comprises two precision injection moulded ABS ramps with built-in rubber feet, self adhesive tops and simple locating instructions. HI-STAK is priced at £3.95 including VAT and postage and packing and is available by mail order from **Warp Factor Eight**, 6 Pelham Road, Braughing, Ware, Hertfordshire SG11 2QU.

Vectrex is described by its manufacturers as the first ever portable computer games system: it incorporates its own screen thereby making it independent of the TV. Vectrex has good graphics and sound effects and a unique control panel is also available. Vectrex retails at approximately £130-140 with cassettes at around £19.95 and you can find out more from **Milton Bradley Limited**, CP House, 97/107 Uxbridge Road, Ealing, London W5 5TZ or phone 01-567 3030.

W H Smith have ordered 50,000 **Oric 1** microcomputers for delivery between April and October 1983. This and promising sales targets have resulted in Oric pulling out of the mail order business from the end of March. Oric have also received large orders from a variety of other high street stores and independent UK dealers.

A new 64K Sinclair ZX81 RAM expansion module, also designed to accept an EPROM as an alternative, has been announced by Camel Products. Called **Dream-81** it is priced at £69.95 plus VAT. For further information contact **Cambridge Microelectronics Ltd**, One Milton Road, Cambridge CB4 1UY, or phone 0223-314814.

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even more than machines and advice, you get good value too. At Micropoint we keep our prices low by buying in volume and we'll also help you to buy with Interest Free Credit* available on purchases over £250 or more; you could walk into Micropoint, choose your micro and take it away with you! You also get the famous Laskys Commitment possibly

the best after-sales package ever offered, with a 14 day exchange period, a 2-year free guarantee† and service by Laskys own network of specialist engineers. If you're already into micros and looking for something new, or better, then Micropoint is the place to find it. Come in and see for yourself.



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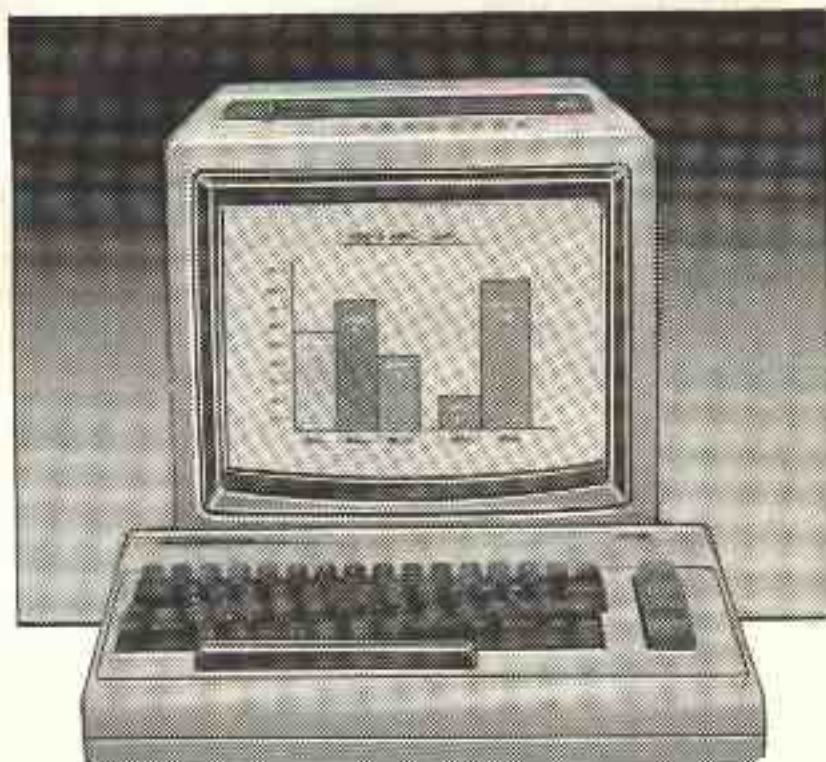
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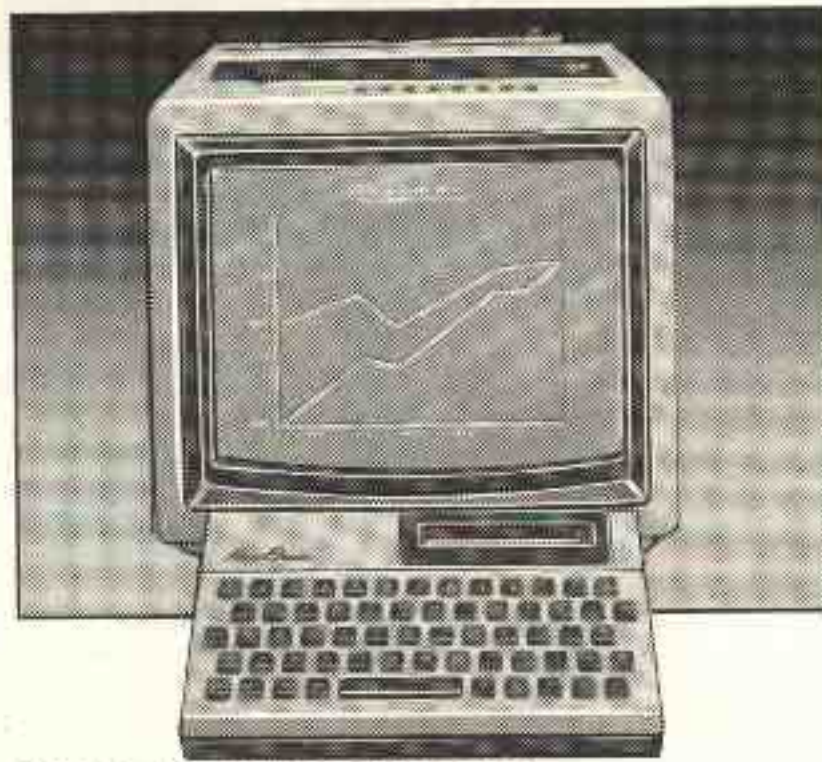
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Value - MicroValue - Micro

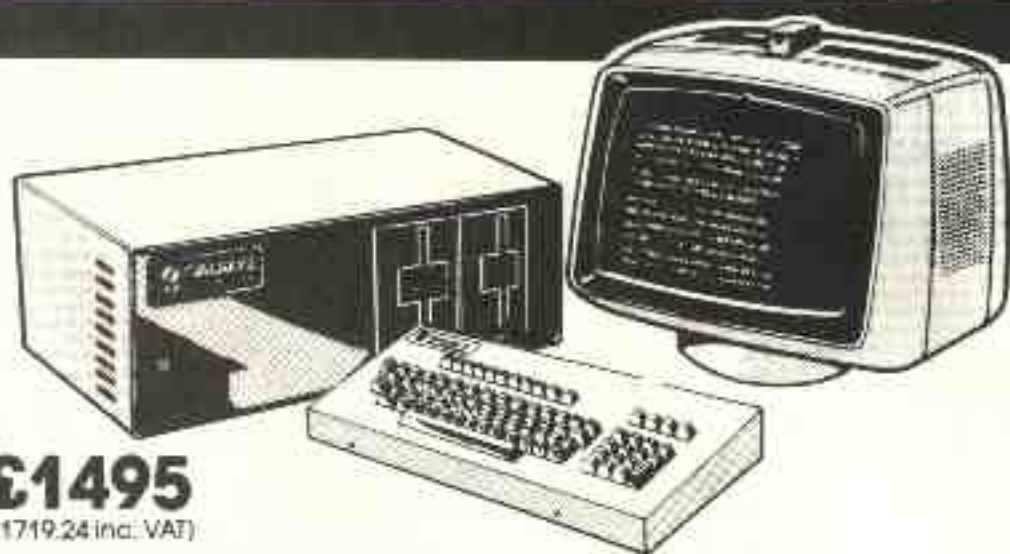
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Nascom owners can now have a professional 80x25 Video display by using the Gemini G812 Intelligent Video Card with on-board Z80A. This card does not occupy system memory space and provides over 50 user controllable functions including prog character set, fully compatible with Gemini G805 and G815/809 Disk Systems. Software supplied on Gemini system disks. Built and tested.

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Disk System for Gemini & nascom

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An optional alternative to CP/M is available for Nascom owners wishing to support existing software. Called POLYDOS 4, it includes an editor and assembler and extends the Nascom BASIC to include disk commands.

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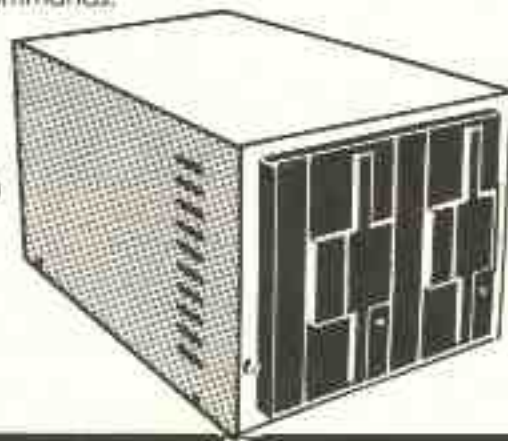
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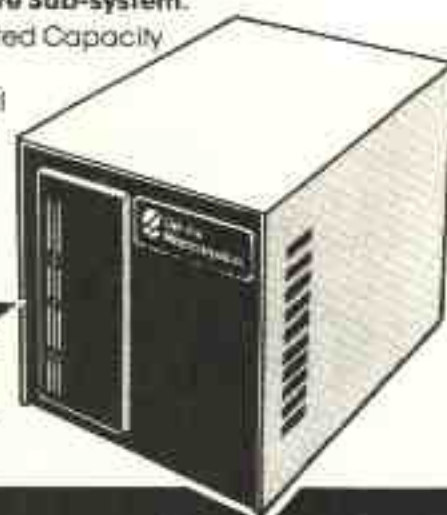


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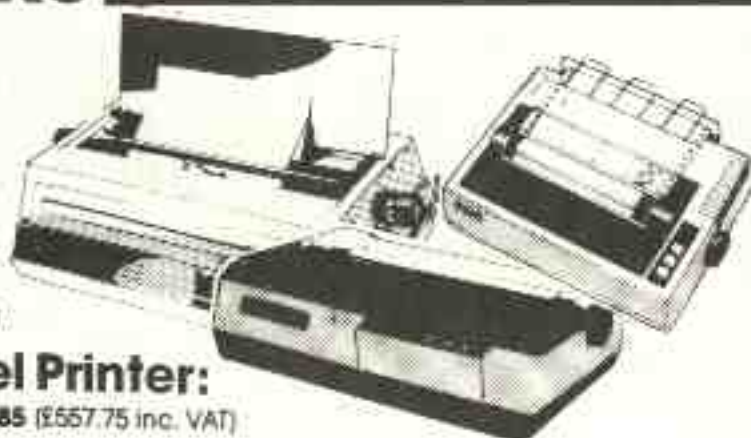
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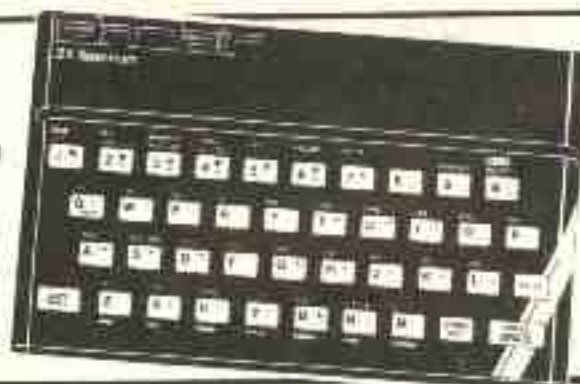
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BUSINESS NEWS



GETTING MATEY▲

NCR has entered the personal computer market with a range of Decision Mate V microcomputers. And with the introduction of Decision Net they have created a local area network for linking computers of varying makes into a communicating and resource sharing system. Decision Mate V has been launched with comprehensive software; single and dual processor models are available which feature memory sizes up to 512,000 bytes, flexible or Winchester disc drives, high speed monochrome or colour capabilities and a 12" CRT display. An advanced feature is that you can add peripherals and memory without opening the cabinet.

Prices for the compact eight bit processor Decision Mate V with monochrome graphics start at £1825. A dual processor model sells for £2175. Prices include dual floppy disc drives, 64K memory, an operating system and a high speed graphics subsystem. For more information write to NCR Ltd, 206 Marylebone Road, London NW1 6LY.

APPLE LIGHTS UP ▶

Gibson Laboratories have

produced a new light pen system for the Apple II, called LPS II. This is a 'true' light pen with which you can draw on the screen as though it were a piece of paper. You can create graphics or select from the menu. LPS II consists of the pen, a sealed card that goes in slot 7, and supporting software. It is the software that allows the pen to perform its 'magic'. Many of the programs on the preliminary

software disc are demo programs to familiarise the user with the capabilities and use of the pen. The retail price is £249 and you can get more details from Pete & Pam Computers, New Hall Hey Road, Rossendale, Lancashire BB4 6JG or 'phone 0706 227011.

HEADACHE SAVER

New slide on anti-glare screens designed to fit any VDU are now available from Dams Business Computers. The screens are easy to fit, clean and maintain.

One range of screens suitable for monitors up to 13" costs £19.95 excluding VAT, with a price of £24.95 for any bigger size. The screens and further information are available from Dams Business Computers Ltd, Goree Road, Kirkby Industrial Estate, Liverpool L33 7UA or 'phone 051-548 7111.

BRITISH IBM LOOKALIKE

The new personal computer from CAL is a lookalike of the IBM machine recently launched in the UK. CAL-PC has a twin processor structure giving eight and 16 bit to suit the growing market for users wanting an 8 bit capacity immediately plus an ability to move



up to 16 bit in the future without any operating upheavals. It also has an RS422 interface for a fast networking facility if needed.

The machine has a standard VDU with a full colour graphics monitor as an option; the machine's keyboard is similar to the IBM's one, which means that IBM software manuals will be relevant for existing IBM users who choose the CAL-PC. Operating systems are CP/M, CP/M-86, MS-DOS and BOS and the full language range for the systems are supported by CAL for the CAL-PC. Various 8 and 16 bit multi-user packages are available.

The basic price for a CAL-PC with 128K RAM with two floppies, screen, keyboard and two additional communications ports is £1,995. One CAL-PC plus 17 cps daisywheel printer, any four CAL single user software packages, plus training, installation and one year guarantee costs £2,945. Further details are available from Computer Ancillaries Limited, 64 High Street, Egham, Surrey.

COMPACT MICRO ►

Texas Instruments have announced the Compact Computer 40, a portable computer for professionals. It has an integrated LCD display, is programmable in enhanced BASIC and can run pre-programmed applications software loaded from either plug-in solid state cartridges or from small tape cartridges.

The computer console has a 34K built in ROM that contains a

BASIC language interpreter and calculator functions are easily available. It is battery operated. The computer contains 6K of RAM and can be expanded to 16K. The Compact Computer has a suggested retail price of £169.95. Further information can be obtained by writing to Texas Instruments Ltd, Manton Lane, Bedford MK41 7PA or phoning 0234 67466.

CAPTURING APPLES

Portapple is a new data capture system for the Apple II which comprises an MSI data capture terminal with wand scanner,

interface card and a floppy disc software starter pack. A universal connector on the Portapple interface card enables many different terminals to be linked to it which further extends the data capture capability of the Apple II. The Portapple interface card, software and an MSI/66 hand-held terminal with a wand scanner costs £778. The system is fully supported by several manuals describing how to operate the terminal, capture data using the wand scanner and transmit it to the Apple micro. For more information contact MSI Data International, IVC Building, 10 Portman Road, Reading, Berkshire or phone 0734 587661.



CRA Corner

As I have said in earlier columns, one of the prime objects of the Computer Retailers Association is to act as a liaison between the customer and the dealer.

The customer quite rightly wants to obtain the best value he possibly can for the hard earned money that he spends on a microcomputer. After all, to most end users the computer is not very much short of a luxury. Even if this is not so, in most cases it is certainly not going to be classed as a necessity. It is, therefore, important that the customer should get the very best value that he possibly can.

On the other hand, the dealer is in business to make a profit. If he does not, he will go out of business; hence he is to some extent under pressure to sell. The

CRA takes a lot of steps to make sure that its members do not go beyond the bounds of reasonableness in attaining their objectives.

By the law of averages, however, occasionally either the customer or the dealer exceeds the bounds of reasonableness in making a deal. A contentious situation arises, both sides inevitably think they are right and the necessity for a third party appears. This is where the CRA steps in, very often as an Arbitrator. In all cases that I am aware of, in the past the CRA has been able to bring together and effect a satisfactory settlement.

A particular member of the Executive Committee is appointed to look after complaints from the customers of members.

Unfortunately, as this column goes to press, our Annual General Meeting is about to be held and that person may well be changed. Consequently, it would be best, should any customer wish to make a complaint about a member of the CRA, that such complaints be forwarded to me at this address: 1 Buckhurst Road, Bexhill on Sea, E. Sussex.

We are often asked to adjudicate between customers and dealers who are not members of the Association. We are quite prepared to do this, but it must be understood that we have no 'leverage' with any firm that is not a member of the CRA. In other words, we will do our best, but we cannot guarantee success.

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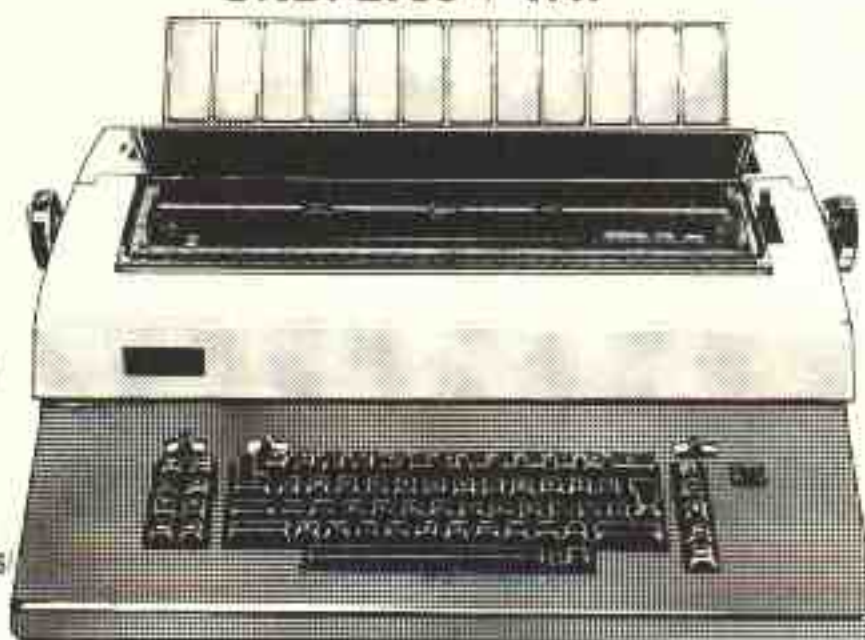
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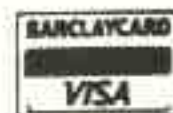
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Critical review?



“The sound commands on the Oric 1 are, for a computer of this price, very sophisticated. Three music channels, and one noise channel, mean that you can program some fairly complex sounds.”

POPULAR COMPUTING WEEKLY

“Oric is everything you hoped it would be. Alive with colour, and zapping with built-in sound effects, the Oric looks like a match for any machine now selling for less than £200.”

YOUR COMPUTER

“The 16k Oric—fighting the 16k Spectrum—is £25 cheaper. It feels a good deal more ‘professional’ than the home-appeal Sinclair. Oric’s sound is extremely versatile, and well up to the standard of the £300 or £400 BBC microcomputer made by Acorn.”

WHICH MICRO?

“Oric was over twice as fast as the Spectrum. Surprisingly perhaps the Oric, which initially seemed only faster when performing the simplest of calculations, has come back to beat the Spectrum by a small amount. As the problems get more complex the Oric comes into its own. One final point—in entering the benchmark tests—the Oric was certainly the easiest to handle.”

WHICH MICRO?

“This slope coupled with the design of the keys makes the Oric an easy machine to touch-type on. All keys have auto-repeat and there are four keys dedicated specifically to cursor control. It is certainly easier to type on than any of Sinclair’s offerings.”

YOUR COMPUTER

“Oric will soon be selling a Modem so that Prestel will become available. Owners will be able to accept teletext—programs loaded straight down the phone line—eventually electronic mail could come into the home by the same route, and with the addition of a tape recorder the Oric with its Modem could become a telephone answerer and message taker.”

YOUR COMPUTER

“One good feature of the Oric is an on-screen reminder in the top right hand corner to show that you’ve engaged all-capitals mode. So much better than the BBC’s variety of lights in the corner of the keyboard. The Oric is sound, simple to get along with and offers great expansion potential.”

WHICH MICRO?

“When compared to the sluggishness of the Spectrum’s keyboard this is certainly an improvement. I can’t see any Orics failing through bad assembly. If only the £2400 IBM were so easy to use.”

WHICH MICRO?

“Instead of the Spectrum’s 28 look-up single-character error reports, the Oric has 18 self-explanatory messages. If you actually want to do computing, rather than just exploring the world of off-the-shelf games, programme entertainment the Oric will be a better buy.”

WHICH MICRO?

“A good speaker and built-in noises get the Orics sound off to a good start. Typing Zap, Ping, Shoot or Explode produces convincing arcade game noises which can easily be incorporated into any program.”

YOUR COMPUTER

“The modem is certainly unusual in a machine of this price. Together with the other peripherals, when finally available, it should make for an attractive package for a small business... surely a match for machines costing much more.”

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IN 'FORTH' (IT'S 10 TIMES FASTER
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ME FOR £89.95! ■

Richard Altwasser and Steven Vickers are the men who invented the Jupiter Ace.

After years of designing micro-computers that use BASIC (both men played a major role in creating the ZX Spectrum), they abandoned it in favour of FORTH.

FORTH is just as easy to learn as BASIC. Yet it's a faster, more compact and more structured language that educationalists and professional programmers alike prefer.

So the Jupiter Ace is the only micro-computer you can buy that is designed around FORTH.

Using it, there's little fear of accidentally "crashing" programs halfway through and having to start all over again (a common fault with BASIC). The Jupiter Ace's comprehensive error checking sees to that.

The Jupiter Ace has a full-size keyboard, high resolution graphics, sound, floating point arithmetic, a fast, reliable cassette interface, 3K of RAM and a full 12 month warranty.

You get all that for £89.95. Plus a mains adaptor, all the leads needed to connect most cassette recorders and TV's, a software catalogue (35 cassettes available, soon to be 50), the Jupiter Ace manual and a free demonstration cassette of 5 programs.

The Jupiter Ace manual is a complete introduction to personal computing and a simple-to-follow course in FORTH, from first principles to confident programming.

Plug-on 16K and 48K memory expansions are also available, at very competitive prices. (There'll be a plug-on printer interface available soon, too.)

It'll take you no time at all to realise how clever Richard and Steven were to design the Jupiter Ace around FORTH. And even less time to realise what a silly price £89.95 is to charge for it.



Technical Information

Hardware

Z80A, 8K ROM, 3K RAM

Keyboard

40 moving keys; auto repeat; Caps Lock

Screen

Memory mapped 32 col x 24 line flicker-free display upper and lower case ascii characters

Graphics

High resolution 256 x 192 pixel user defined characters

Sound

Internal loudspeaker may be programmed for entire audio spectrum.

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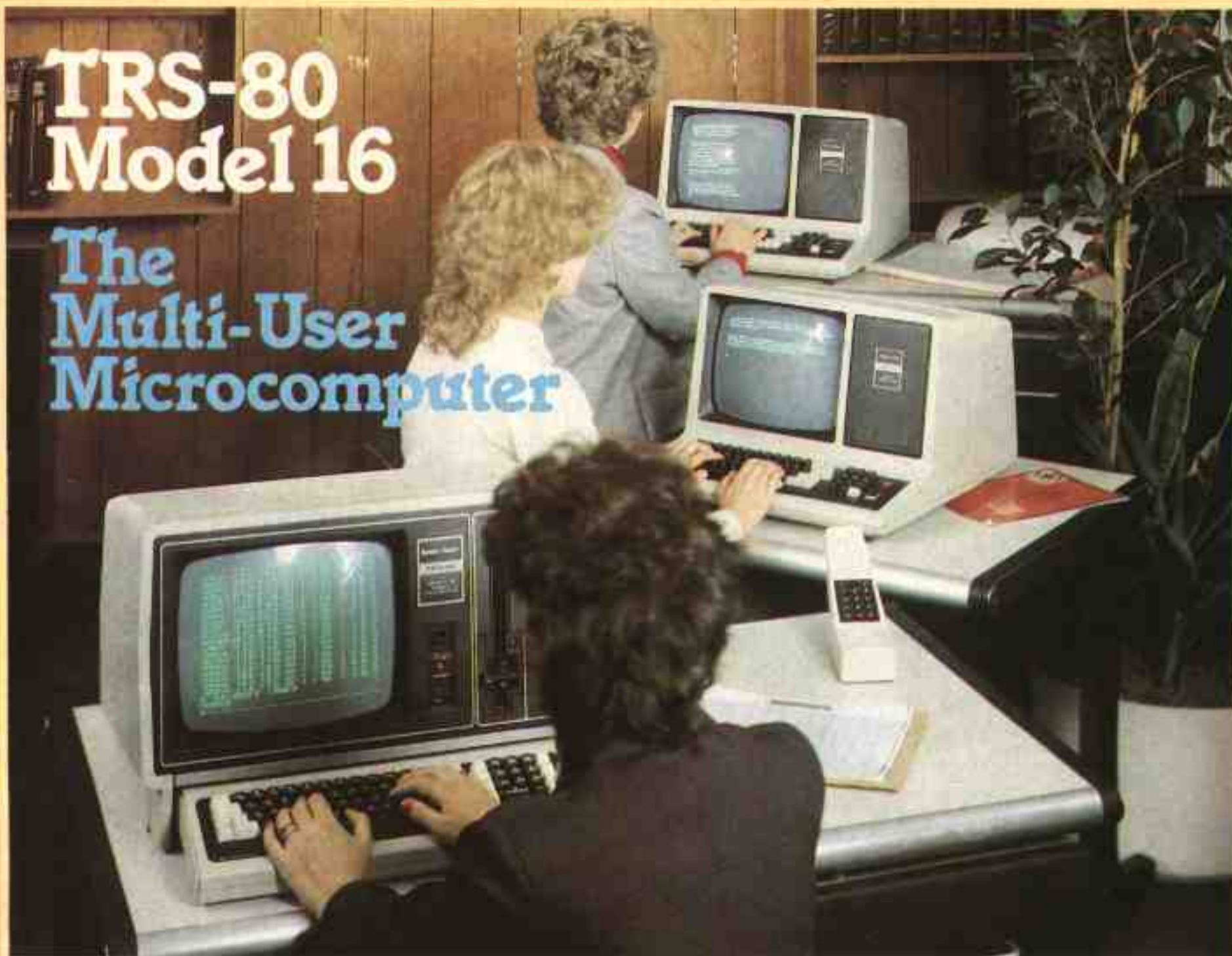
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- 40 or 80 characters to the line – without affecting the 28K bytes of RAM at your disposal;
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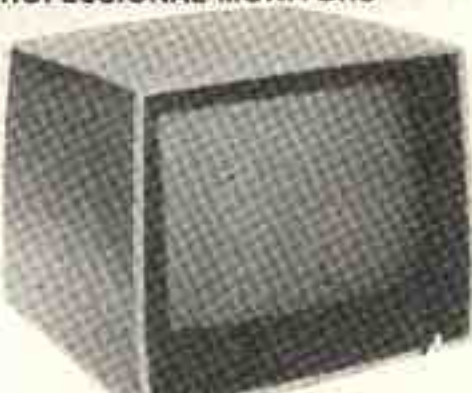
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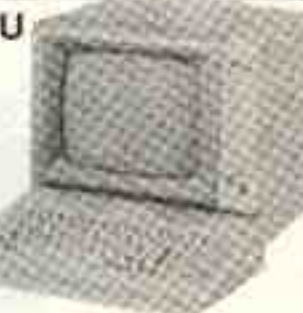


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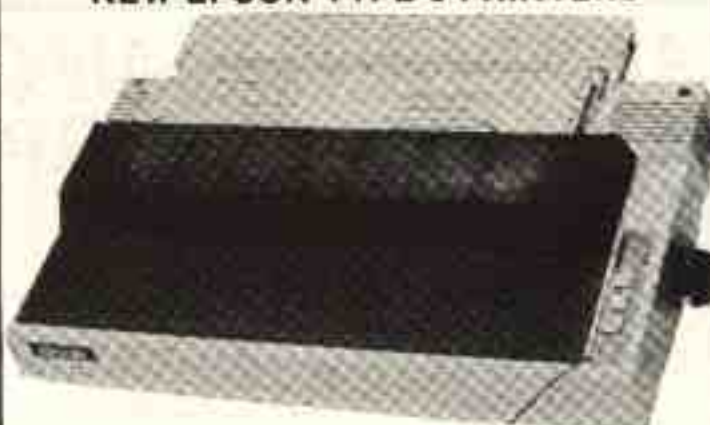


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MARKET SURVEY

Before you rush out and buy your first micro you should read through this guide to make sure you know what's available.

If you are reading this you are presumably toying (even if very seriously) with the idea of buying a microcomputer. In the next few pages we have put together some facts and figures relating to some of the cheaper micros on the market, but you should keep in mind some useful tips before you actually put pen to cheque-book.

The first thing to decide (or at least have given some thought to) is what do you want your computer to do for you? Do you merely want it to play games on, to keep the children quiet (!) and to save you money at the local arcade? Or do you want to keep track of your household accounts and write a simple piece of accounting software for your small business? The answer to these questions will help enormously when you come to look at the type of micro you might buy. The chances are that you will want a mixture of these abilities in your micro, after all man cannot live by financial software alone!

HELP IS AT HAND

If you have not ever had practical experience on a micro why not go along to a local computer users' group — you don't usually have to own a micro to join — and finding out first hand from existing owners is often worth a lot more than pages of enthusiastic words on an advertising leaflet. Be prepared to listen to a lot of enthusiastic words from the owners though. Also pop into your High Street stores and ask lots of penetrating questions — a lot of micros are being sold across the counter these days. When you actually do buy a machine it will almost certainly

come with some documentation and the quantity and quality of this varies tremendously from machine to machine. So it might well be an idea to peruse the shelves of the local bookstore where you will find an abundance of books both general and specifically for the more popular micros. Don't forget too that there are lots of computer exhibitions and courses around and these can yield invaluable information. And of course there are excellent computer magazines around that give reviews of machines and their peripherals as well as programs that you can type in yourself, rather than buying a commercial package.

Well now that you have all the background information you will have to get down to making that decision but let me warn you, you will probably get hooked by micro fever and will want to add all sorts of exciting extras to your basic machine so be prepared!

SPECIFICALLY...

The following pages are intended as a quick reference guide to some of the cheaper micros available and as such most of it should be fairly self-explanatory, but here's a little help on some points.

MEMORY The memory sizes are given for the basic machine, and where this can be expanded you will be told in the Notes section.

LANGUAGE This is the language that comes as standard with the basic machine; if other languages are available this will be detailed in the Notes section.

CASSETTE The cassette speed is given in baud where we were able to ascertain it.

DISC At the range of micros covered this is not normally standard on the machine, although many can have this capability added.

KEYBOARD This will tell you whether the machine has a standard QWERTY keyboard, has cursor control keys, a separate numeric keypad and special function keys. Some of the cheaper micros have membrane-type keyboards, this will be mentioned in the Notes section if applicable.

DISPLAY This is fairly self-explanatory but watch out that you don't buy a machine and find that you can't plug it in to your TV!

INTERFACE The presence of parallel and serial interfaces are indicated as well as expansion capabilities (bus interface).

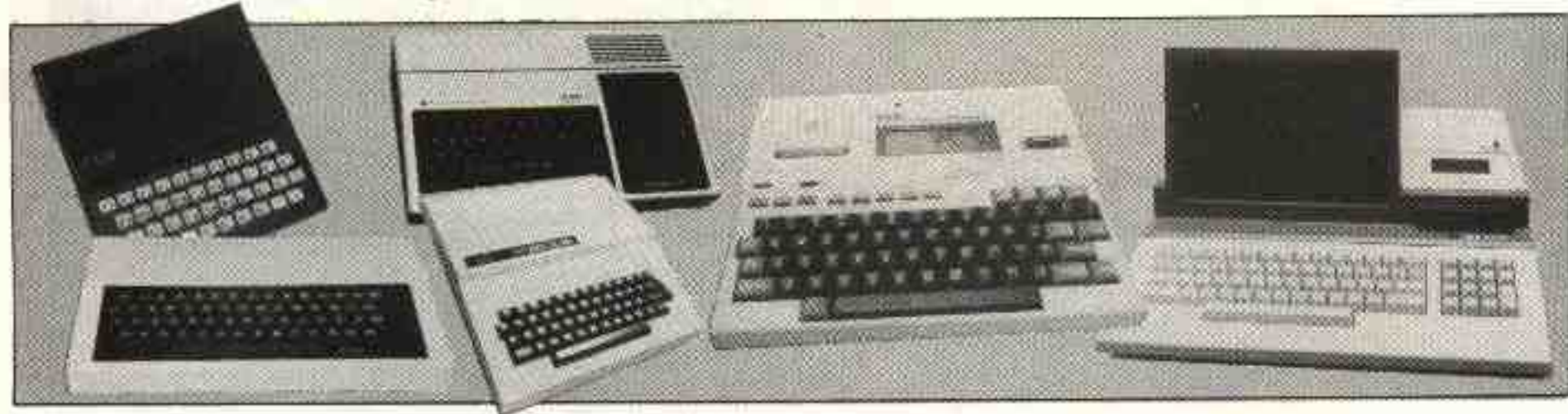
GRAPHICS The type of graphics and maximum resolution are given together with the maximum number of colours that are possible at one time on the screen.

SOUND The number of sound channels is given.

NOTES Since the above information is for the basic machine, this section details other facts, such as the type of microprocessor used, peripherals that are available (printer, joysticks etc) and whether the machine can be expanded. The supplier/manufacturer is given so if you want to know more about the micro please contact them and not us.

IN CONCLUSION

Please note that the information given in this guide is intended as simply that — a guide — and was correct as far as we know at the time of writing. New add-ons and extras are being introduced all the time so more could be available by the time you read this. The prices given are for the basic machine so don't forget that the extras will cost you extra. It is worth shopping around though as many micros are sold quite a bit cheaper through certain outlets.

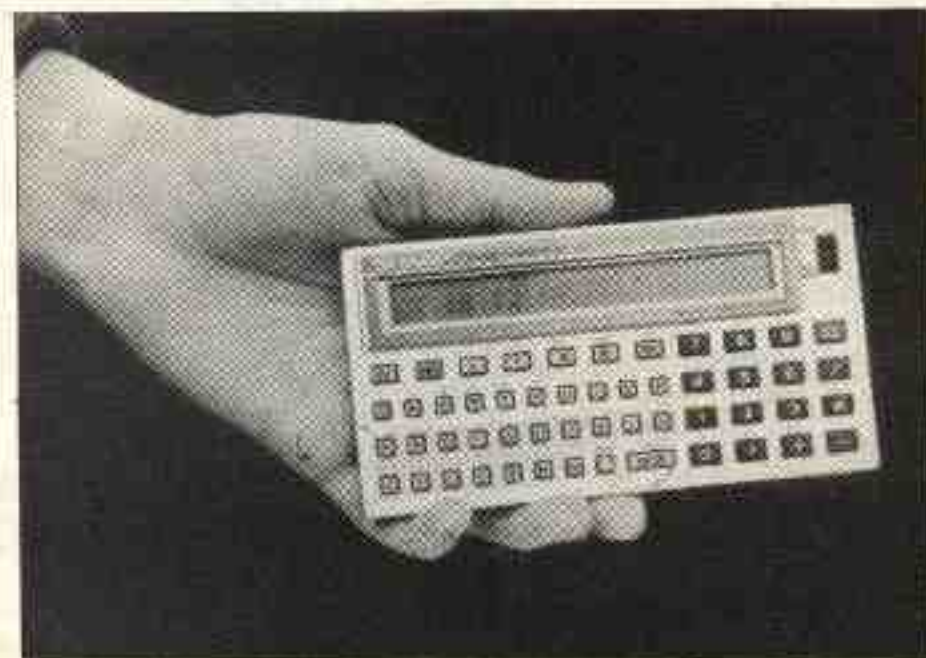


ZX81

£69.95

MEMORY	1K RAM	8K ROM
LANGUAGE	Sinclair BASIC	
CASSETTE	250 baud	
DISC	☐	DOS
KEYBOARD	QWERTY✓	CURSOR✓ NUMERIC✓ FUNCT✓
DISPLAY	TV✓	MONITOR✓ SUPPLIED✓
INTERFACE	PARA✓	SERIAL✓ BUS✓
GRAPHICS	BLOCK✓	USER✓
	LINE✓	RES 64 by 48
	COLOUR✓	TEXT 24 by 32
SOUND	☐	

Notes. The Sinclair ZX81 is a Z-80A based micro with a touch sensitive keyboard and is also available in kit form for £49.95. It can be expanded up to 64K and the ZX printer may be added. A good machine for beginners and educational purposes, the supplier is **Sinclair Research**, 6 Kings Parade, Cambridge.



SHARP PC-1251

£79.95

MEMORY	4.2K RAM	24K ROM
LANGUAGE	BASIC	
CASSETTE	Microcassette in optional module	
DISC	☐	DOS
KEYBOARD	QWERTY✓	CURSOR✓ NUMERIC✓ FUNCT✓
DISPLAY	TV✓	MONITOR✓ SUPPLIED✓
INTERFACE	PARA✓	SERIAL✓ BUS✓
GRAPHICS	BLOCK✓	USER✓
	LINE✓	RES. by
	COLOUR✓	TEXT 1 by 24
SOUND	☒	

Notes. The Sharp PC-1251 is an eight bit CMOS based micro which is pocket sized. It has a liquid crystal display, an optional integrated printer/microcassette recorder and has battery backup. The supplier is **Sharp Electronics UK**, Thorp Road, Newton Heath, Manchester M10 9BE.

CASIO FX-702P

£89.95

MEMORY	1K RAM	8K ROM
LANGUAGE	BASIC	
CASSETTE	Yes, (with special adaptor)	
DISC	☐	DOS
KEYBOARD	QWERTY✓	CURSOR✓ NUMERIC✓ FUNCT✓
DISPLAY	TV✓	MONITOR✓ SUPPLIED✓
INTERFACE	PARA✓	SERIAL✓ BUS✓
GRAPHICS	BLOCK✓	USER✓
	LINE✓	RES. by
	COLOUR✓	TEXT 1 by 20
SOUND	☐	

Notes. The Casio FX-702P is a hand-held micro with a CMOS microprocessor. The keyboard has A to Z layout and the display is via a liquid crystal display screen. The micro is battery driven and a printer is available. The supplier is **Casio**, Unit 6, 1000 North Circular Road, London NW7.



JUPITER ACE

£89.95

MEMORY	3K RAM	8K ROM
LANGUAGE	Ace FORTH	
CASSETTE	1500 baud	
DISC	☐	DOS
KEYBOARD	QWERTY✓	CURSOR✓ NUMERIC✓ FUNCT✓
DISPLAY	TV✓	MONITOR✓ SUPPLIED✓
INTERFACE	PARA✓	SERIAL✓ BUS✓
GRAPHICS	BLOCK✓	USER✓
	LINE✓	RES 512 by 368
	COLOUR✓	TEXT 24 by 32
SOUND	☒	

Notes. The Jupiter Ace is a Z-80A based micro which is fairly new on the market, being unusual in that it does not have BASIC as its standard language. Planned are a Centronics printer, joysticks and a colour board. The manual which comes with the machine goes into detail about programming and using FORTH. Since it is a recently introduced machine there is little software available for it at the time of writing. The suppliers are **Jupiter Cantab**, 22 Foxhollow, Bar Hill, Cambridge CB3 8EP, phone 0954-80437.

ORIC 1

£99.95

MEMORY	16K RAM	16K ROM
LANGUAGE	BASIC	
CASSETTE	300 or 2400 baud	
DISC	extra	DOS
KEYBOARD	QWERTY ☒	CURSOR ☒ NUMERIC ☐ FUNCT ☐
DISPLAY	TV ☒	MONITOR ☐ SUPPLIED ☐
INTERFACE	PARA ☒	SERIAL ☐ BUS ☒
GRAPHICS	BLOCK ☒	USER 80
	LINE ☒	RES 200 by 240
	COLOUR 8	TEXT 28 by 40
SOUND	3 channels	

Notes. The Oric 1 is a 6502A based micro and is aimed at the ZX Spectrum market. A 48K model is available which has 64K RAM with 16K ROM overlaid. You can attach a printer, communications modem and you can have audio output through your hi-fi. A manual comes with the machine, but make sure that you also get the errata sheet that goes with it. You can buy the Oric by mail order and the supplier is **Oric Products International Ltd**, Coworth Park London Road, Ascot, Berkshire SL5 7SE.



ZX SPECTRUM

£125

MEMORY	16K RAM	16K ROM
LANGUAGE	Sinclair BASIC	
CASSETTE	1500 baud	
DISC	TBA	DOS
KEYBOARD	QWERTY ☒	CURSOR ☐ NUMERIC ☐ FUNCT ☐
DISPLAY	TV ☒	MONITOR ☐ SUPPLIED ☐
INTERFACE	PARA ☐	SERIAL ☐ BUS ☒
GRAPHICS	BLOCK ☒	USER 21 ☐
	LINE ☒	RES 256 by 192
	COLOUR 8	TEXT 24 by 32
SOUND	Single channel	

Notes. The Sinclair ZX Spectrum is a Z-80A based micro with a moulded rubber keyboard. A 48K version is priced at £175. A ZX printer is available and a ZX Microdrive and RS232 interface are expected. Available at High Street stores it is a very popular micro with a wide variety of commercial software to choose from. The supplier is **Sinclair Research**, 6 Kings Parade, Cambridge.

ACORN ATOM

£150

MEMORY	2K RAM	8K ROM
LANGUAGE	BASIC	
CASSETTE	300 baud	
DISC	extra	DOS
KEYBOARD	QWERTY ☒	CURSOR ☒ NUMERIC ☐ FUNCT ☐
DISPLAY	TV ☒	MONITOR ☒ SUPPLIED ☐
INTERFACE	PARA ☒	SERIAL ☐ BUS ☒
GRAPHICS	BLOCK ☐	USER
	LINE ☒	RES 256 by 192
	COLOUR 4	TEXT 16 by 32
SOUND	Single channel	

Notes. The Acorn ATOM is a 6802 based micro which has a rather unusual version of BASIC. It was one of the first machines that had a built-in assembler. The supplier is **Acorn Computers**, Fulbourn Road, Cherry Hinton, Cambridge.



SHARP PC-1500

£169.95

MEMORY	3.5K RAM	16K ROM
LANGUAGE	BASIC	
CASSETTE	extra	
DISC	☐	DOS
KEYBOARD	QWERTY ☒	CURSOR ☐ NUMERIC ☒ FUNCT ☒
DISPLAY	TV ☐	MONITOR ☐ SUPPLIED ☒
INTERFACE	PARA ☐	SERIAL ☒ BUS ☒
GRAPHICS	BLOCK ☐	USER ☐
	LINE ☐	RES 120 by 32
	COLOUR ☐	TEXT 26 by 7
SOUND	☒	

Notes. The Sharp PC-1500 is an eight-bit CMOS based micro which is small enough to be easily hand-held with an LCD screen. Various additions are available including a plotter, printer and interface, a cassette interface and plug-in chips, allowing the micro to be expanded to 11.5K. An applications and user manual come with the machine and the supplier is **Sharp Electronics (UK) Ltd**, Thorp Road, Newton Heath, Manchester M10 9BE.

VIC-20

£169.99

MEMORY	5K RAM	16K ROM
LANGUAGE	PET BASIC	
CASSETTE	300 baud	
DISC	extra	DOS
KEYBOARD	QWERTY✓	CURSOR✓ NUMERIC✓ FUNCT✓
DISPLAY	TV✓	MONITOR✓ SUPPLIED✓
INTERFACE	PARA✓	SERIAL✓ BUS✓
GRAPHICS	BLOCK✓	USER✓
	LINE✓	RES 176 by 184
	COLOUR 16	TEXT 23 by 21
SOUND	✓	

Notes. The VIC-20 is a 6502 based micro which requires a special cassette recorder. The system can be expanded up to 16K RAM. Programs can also be loaded from cartridges. There is a large amount of software available. The machine comes with a manual. The suppliers are **Commodore**, 675 Ajax Avenue, Trading Estate, Slough, phone 0753-74111.



SORD M5

£189.95

MEMORY	4K RAM	8K ROM
LANGUAGE	BASIC-I, FALC-E	
CASSETTE	extra	
DISC	□	DOS
KEYBOARD	QWERTY✓	CURSOR✓ NUMERIC✓ FUNCT✓
DISPLAY	TV✓	MONITOR✓ SUPPLIED✓
INTERFACE	PARA✓	SERIAL✓ BUS✓
GRAPHICS	BLOCK✓	USER✓
	LINE✓	RES 256 by 192
	COLOUR 16	TEXT 32 by 24
SOUND	Three note chords and a buzzer tone	

Notes. The Sord M5 is a Z-80A based micro. The machine comes complete with all necessary leads, power pack, cartridge including BASIC-I, a cassette with two games and a manual on the BASIC and a user's manual. The machine is only just available and will be in High Street stores soon. Memory expansion and a printer are planned, but the machine has a Centronics interface already. The supplier is **Sord**, Samuel House, St Albans Street, Haymarket, London SW1Y 4SQ.



COLOUR GENIE

£199

MEMORY	16K RAM	16K ROM
LANGUAGE	Microsoft BASIC	
CASSETTE	1200 baud	
DISC	optional	DOS
KEYBOARD	QWERTY✓	CURSOR✓ NUMERIC✓ FUNCT✓
DISPLAY	TV✓	MONITOR✓ SUPPLIED✓
INTERFACE	PARA✓	SERIAL✓ BUS✓
GRAPHICS	BLOCK✓	USER 128
	LINE✓	RES 160 by 96
	COLOUR 8	TEXT 40 by 24
SOUND	3 channels	

Notes. The Colour Genie is a Z-80 based micro capable of expansion via a 16K RAM card. Various accessories are available including a cassette recorder, dot matrix printer, joysticks and a light pen. The machine also includes a music synthesiser. The supplier is **Lowe Electronics**, Chesterfield Road, Matlock, Derbyshire DE4 5LE.



DRAGON 32

£199

MEMORY	32K RAM	16K ROM
LANGUAGE	Microsoft extended colour BASIC	
CASSETTE	1500 baud	
DISC	extra	DOS
KEYBOARD	QWERTY✓	CURSOR✓ NUMERIC✓ FUNCT✓
DISPLAY	TV✓	MONITOR✓ SUPPLIED✓
INTERFACE	PARA✓	SERIAL✓ BUS✓
GRAPHICS	BLOCK✓	USER✓
	LINE✓	RES 256 by 192
	COLOUR 8	TEXT 16 by 32
SOUND	Single channel	

Notes: The Dragon 32 is a 6809 based micro, fairly new and very much in demand. Joysticks and a ROM cartridge are available and the machine comes with a manual and a quick reference guide to the BASIC. The supplier is **Dragon Data Ltd**, Kenfig Industrial Estate, Murgan, Port Talbot, West Galmorgan and it is normally available in the High Street stores.



TI-99/4A

£199

MEMORY	16K RAM	16K ROM
LANGUAGE	TI BASIC	
CASSETTE	Yes (special cable required)	
DISC	extra	DOS
KEYBOARD	QWERTY✓	CURSOR✓ NUMERIC✓ FUNCT✓
DISPLAY	TV✓	MONITOR✓ SUPPLIED✓
INTERFACE	PARA✓	SERIAL✓ BUS✓
GRAPHICS	BLOCK✓	USER✓
	LINE✓	RES 256 by 192
	COLOUR 16	TEXT 24 by 32
SOUND	Three tones plus noise	

Notes: The TI 99/4A is a 9900 based micro which can be expanded to up to 48K RAM. Additional extras include a ROM pack, speech synthesiser, twin joysticks, disc drive, RS232/Centronics interface, printer and peripheral expansion system. The machine comes with a Users Reference Guide and Beginner's BASIC. The supplier is **Texas Instruments Ltd**, Manton Lane, Bedford MK41 7PU.



COMPUTERS LYNX

£225

MEMORY	48K RAM	16K ROM
LANGUAGE	Computers BASIC	
CASSETTE	1200 baud	
DISC	TBA	DOS CP/M
KEYBOARD	QWERTY✓	CURSOR✓ NUMERIC✓ FUNCT✓
DISPLAY	TV✓	MONITOR✓ SUPPLIED✓
INTERFACE	PARA✓	SERIAL✓ BUS✓
GRAPHICS	BLOCK✓	USER✓
	LINE✓	RES 248 by 256
	COLOUR 8	TEXT 40 by 24
SOUND	Single channel	

Notes: The Lynx is a Z-80A based micro which is expandable up to 192K RAM. Among the extras planned are disc drives, printers, mono and colour monitors, light pen. Three additional languages are also planned — Pascal, FORTH and COMAL. The suppliers are **Computers Ltd**, 33A Bridge Street, Cambridge CB2 1UW.



NEWBRAIN

£233

MEMORY	32K RAM	18K ROM
LANGUAGE	NewBrain BASIC	
CASSETTE	1200 baud	
DISC	extra	DOS
KEYBOARD	QWERTY✓	CURSOR✓ NUMERIC✓ FUNCT✓
DISPLAY	TV✓	MONITOR✓ SUPPLIED✓
INTERFACE	PARA✓	SERIAL✓ BUS✓
GRAPHICS	BLOCK✓	USER✓
	LINE✓	RES 640 by 250
	COLOUR	TEXT 24 by 80
SOUND		

Notes: The NewBrain is a Z-80A based micro which can be expanded to 512K RAM. It is very small, almost pocket-sized, and both Videotext and battery modules are available. The machine comes with a manual and the supplier is **Grundy Business Systems Ltd**, Grundy House, Somerset Road, Teddington, Middlesex TW11 8TD.



ATARI 400

£245

MEMORY	16K RAM	8K ROM
LANGUAGE	Atari BASIC	
CASSETTE	600 baud	
DISC	extra	DOS
KEYBOARD	QWERTY✓	CURSOR✓ NUMERIC✓ FUNCT✓
DISPLAY	TV✓	MONITOR✓ SUPPLIED✓
INTERFACE	PARA✓	SERIAL✓ BUS✓
GRAPHICS	BLOCK✓	USER✓
	LINE✓	RES 320 by 192
	COLOUR 16	TEXT 24 by 40
SOUND	Three channels	

Notes: The Atari 400 is a 6502 based micro, the lowest in the Atari range. It, like so many of the cheaper micros, has a touch keyboard and the number of colours can be mixed to make a maximum of 256. Joysticks and light pen can be added. Well known as a games machine there are a large number of games cartridges available. The Atari is also a flexible microcomputer, although this fact has not been publicised properly by Atari. The supplier is **Atari (UK) Ltd**, PO Box 39, Alperton Lane, Wembley, Middlesex.



BBC MICRO MODEL A**£299**

MEMORY	16K RAM	16K ROM
LANGUAGE	BBC BASIC	
CASSETTE	300 or 1200 baud	
DISC	extra	DOS
KEYBOARD	QWERTY✓	CURSOR✓ NUMERIC✓ FUNCT✓
DISPLAY	TV✓	MONITOR✓ SUPPLIED✓
INTERFACE	PARA✓	SERIAL✓ BUS✓
GRAPHICS	BLOCK✓	USER✓
	LINE✓	RES 320 by 256
	COLOUR 8	TEXT 25 by 40
SOUND	3 channels	

Notes. The BBC Micro is a 6502 based micro. Up to four 16K language ROMs may be plugged into the machine at any one time, including Pascal, word processing, computer aided design, and Teletext. Voice synthesis circuits, a cartridge ROM pack interface, various alternative high level languages in ROM, Sound network interface, paddles, cassette recorder, printers and second microprocessors are all available, as are a wide variety of commercial software. The BBC Micro has found particular favour in educational establishments. The supplier is **BBC Micro Computer Systems**, PO Box 7, London W3 6LY.

**COMMODORE 64****£299**

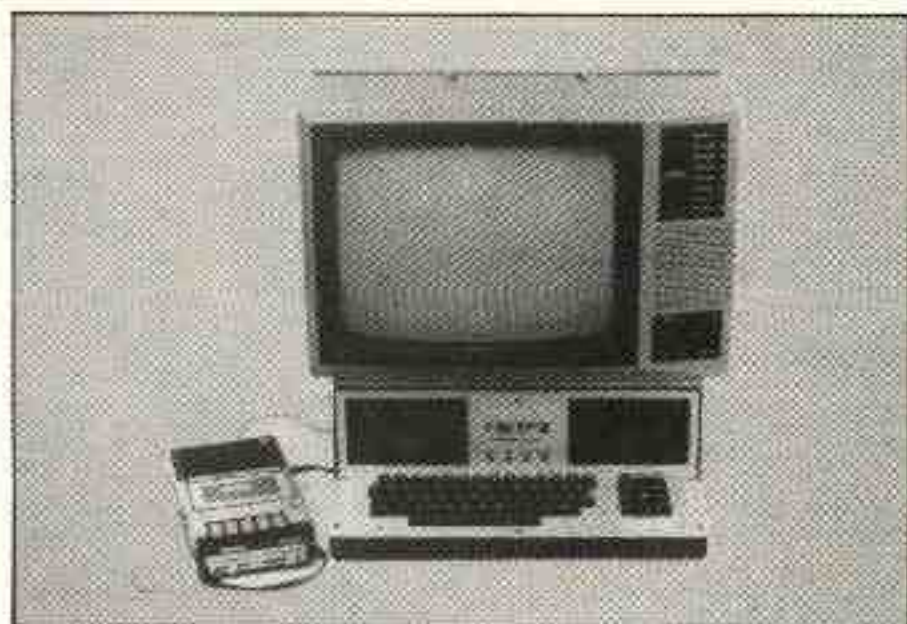
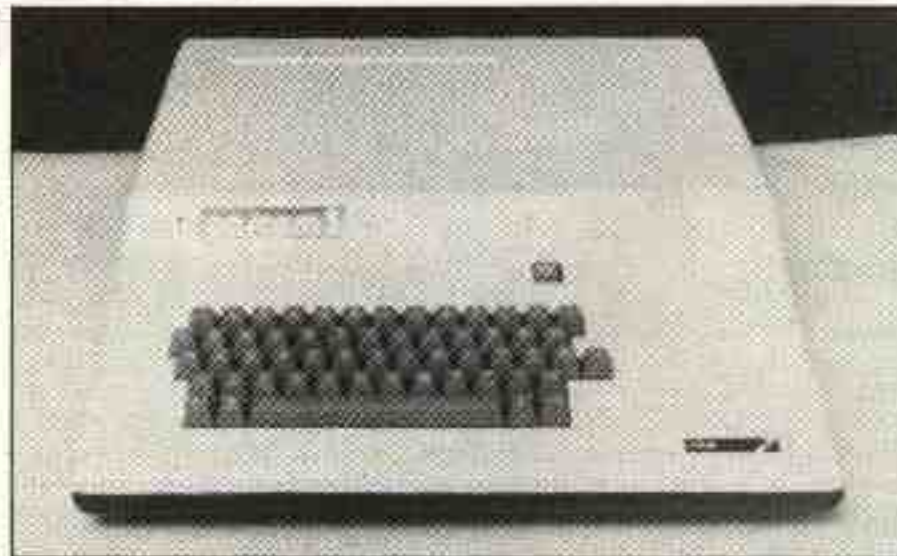
MEMORY	64K RAM	26K ROM
LANGUAGE	PET BASIC	
CASSETTE	1000 baud	
DISC	extra	DOS
KEYBOARD	QWERTY✓	CURSOR✓ NUMERIC✓ FUNCT✓
DISPLAY	TV✓	MONITOR✓ SUPPLIED✓
INTERFACE	PARA✓	SERIAL✓ BUS✓
GRAPHICS	BLOCK✓	USER✓
	LINE✓	RES 320 by 200
	COLOUR 16	TEXT 40 by 25
SOUND	Three channels	

Notes. The Commodore 64 is a 6510 based micro that can also use Pascal, COMAL, LOGO, FORTH and PILOT. Programs can be loaded from cassette recorder or disc drives, both extra, or cartridges. The various peripherals include printer, joystick and games paddles. The sound facility gives a range of nine octaves and three voices. A User Guide is provided with the machine, although its actual value is questionable. The suppliers are **Commodore**, 675 Ajax Avenue, Trading Estate Slough, phone (0753-74111).

NASCOM 3**£376**

MEMORY	48K RAM	10K ROM
LANGUAGE	Microsoft BASIC	
CASSETTE	300 or 1200 baud	
DISC	extra	DOS CP/M or NAS-DOS
KEYBOARD	QWERTY✓	CURSOR✓ NUMERIC✓ FUNCT✓
DISPLAY	TV✓	MONITOR✓ SUPPLIED✓
INTERFACE	PARA✓	SERIAL✓ BUS✓
GRAPHICS	BLOCK✓	USER✓
	LINE✓	RES 800 by 256
	COLOUR 8	TEXT 25 by 80
SOUND	□	

Notes. The Nascom 3 is a Z-80 based micro. A second version of BASIC and Pascal are also available, as are a cassette recorder and light pen. The supplier is **Lucas Logic Ltd**, Welton Road, Wedgerock Industrial Estate, Warwick CV34 5PZ, phone 0926-497733.

**POWERTRAN CORTEX****£395**

MEMORY	64K RAM	24K ROM
LANGUAGE	BASIC	
CASSETTE	Yes (baud rate is user selectable)	
DISC	extra	DOS
KEYBOARD	QWERTY✓	CURSOR✓ NUMERIC✓ FUNCT✓
DISPLAY	TV✓	MONITOR✓ SUPPLIED✓
INTERFACE	PARA✓	SERIAL✓ BUS✓
GRAPHICS	BLOCK✓	USER✓
	LINE✓	RES 256 by 192
	COLOUR	TEXT 40 by 24
SOUND	□	

Notes. The Cortex is a TMS9995 based micro which also comes in kit form for £295. All text characters are redefinable and FORTH is expected soon as an additional language. Extras include an RS232 serial interface, an expansion bus parallel interface, up to four disc drives and the possibility of an RGB monitor interface in the future. The supplier is **Powertran Cybernetics**, Portway Industrial Estate, Andover, Hampshire SP10 3NM.

BBC MICRO MODEL B**£399**

MEMORY	32K RAM	32K ROM
LANGUAGE	BBC BASIC	
CASSETTE	300 or 1200 baud	
DISC	extra	DOS
KEYBOARD	QWERTY✓	CURSOR✓ NUMERIC□ FUNCT✓
DISPLAY	TV✓	MONITOR✓ SUPPLIED□
INTERFACE	PARA✓	SERIAL✓ BUS✓
GRAPHICS	BLOCK✓	USER✓
	LINE✓	RES 640 by 256
	COLOUR 8	TEXT 28 by 80
SOUND	3 channels	

Notes. The BBC Micro is a 6502 based micro, with Model B being an enhanced version of Model A so refer to that for the list of peripherals that are available. In addition on Model B the following are provided: serial interface to RS423 standard, eight bit I/O port, eight bit 'Centronics' type parallel printer port, four 12 bit analogue input channels, extension bus for connection to Prestel, Teletext and other expansion units, and all interface sockets to external peripherals. The supplier is **BBC Micro Computer Systems**, PO Box 7, London W3 6UY.

**TANDY COLOUR****£449**

MEMORY	16K RAM	16K ROM
LANGUAGE	Extended Colour BASIC	
CASSETTE	1500 baud	
DISC	extra	DOS
KEYBOARD	QWERTY✓	CURSOR✓ NUMERIC□ FUNCT✓
DISPLAY	TV✓	MONITOR□ SUPPLIED□
INTERFACE	PARA□	SERIAL✓ BUS✓
GRAPHICS	BLOCK✓	USER□
	LINE✓	RES 192 by 256
	COLOUR 8	TEXT 16 by 32
SOUND	Single channel	

Notes. The Tandy Colour Computer is a 6809E based micro which also comes in a 32K version for £499, or you can buy an upgrade kit. A printer and disc drives may be added, joysticks are available and can be used in effect like paintbrushes. The micro comes complete with an operator's manual, a tutorial manual on Standard Colour BASIC and a tutorial manual on Extended Colour BASIC. The supplier is **Tandy Corporation**, 12th Floor, Tameway Tower, Bridge Street, Walsall.

**ATARI 800****£499**

MEMORY	16K RAM	8K ROM
LANGUAGE	Atari BASIC	
CASSETTE	600 baud	
DISC	extra	DOS
KEYBOARD	QWERTY✓	CURSOR□ NUMERIC□ FUNCT✓
DISPLAY	TV✓	MONITOR□ SUPPLIED□
INTERFACE	PARA□	SERIAL□ BUS✓
GRAPHICS	BLOCK□	USER✓
	LINE✓	RES 320 by 192
	COLOUR 16	TEXT 24 by 40
SOUND	Three channels	

Notes. The Atari 800 is a 6502 based micro which differs from the Atari 400 in two main ways: it has a proper typewriter keyboard and can accept two cartridges simultaneously. It can also be expanded up to 48K RAM. The supplier is **Atari (UK) Ltd.**, PO Box 59, Alperston Lane, Wembley, Middlesex.

**EPSON HX-20****£499**

MEMORY	16K RAM	32K ROM
LANGUAGE	Extended Microsoft BASIC	
CASSETTE	Built-in microcassette	
DISC	□	DOS
KEYBOARD	QWERTY✓	CURSOR✓ NUMERIC□ FUNCT✓
DISPLAY	TV✓	MONITOR□ SUPPLIED✓
INTERFACE	PARA□	SERIAL✓ BUS✓
GRAPHICS	BLOCK✓	USER 32□
	LINE□	RES 120 by 32
	COLOUR□	TEXT 20 by 4
SOUND	□	

Notes. The Epson HX-20 is a CMOS 6301 based micro which is portable and battery driven, although you can plug it into the mains. The unit incorporates a liquid crystal display screen, full typewriter keyboard, printer and microcassette; a TV display adaptor and acoustic coupler are also available and the micro can be expanded to 64K ROM and 32K RAM. The supplier is **Epson (UK) Ltd.**, Dorland House, 388 High Road, Wembley, Middlesex HA9 6UH.



SHARP MZ-80A

£549

MEMORY	48K RAM	4K ROM
LANGUAGE	Microsoft BASIC (on tape)	
CASSETTE	1200 baud (built-in)	
DISC	extra	DOS
KEYBOARD	QWERTY✓	CURSOR✓ NUMERIC✓ FUNCT□
DISPLAY	TV□	MONITOR□ SUPPLIED✓
INTERFACE	PARA✓	SERIAL□ BUS✓
GRAPHICS	BLOCK✓	USER□
	LINE□	RES 80 by 90
	COLOUR□	TEXT 25 by 40
SOUND	Single channel	

Notes. The Sharp MZ80A is a Z-80 based micro. An expansion unit, printer, floppy disc unit and other peripherals are available. Other languages can also be used such as Pascal merely by loading from tape. With the floppy disc option the machine can respond to higher level software such as Disc BASIC and FDOS (including BASIC compiler). A small range of business and educational software is available. The supplier is available. The supplier is **Sharp Electronics (UK) Ltd**, Thorp Road, Newton Heath, Manchester M10 9BE.



DAI

£595

MEMORY	48K RAM	24K ROM
LANGUAGE	Microsoft BASIC	
CASSETTE	600 baud	
DISC	extra	DOS
KEYBOARD	QWERTY✓	CURSOR✓ NUMERIC□ FUNCT□
DISPLAY	TV✓	MONITOR✓ SUPPLIED□
INTERFACE	PARA✓	SERIAL✓ BUS✓
GRAPHICS	BLOCK□	USER□
	LINE✓	RES 336 by 256
	COLOUR 16	TEXT 24 by 80
SOUND	Single channel	

Notes. The DAI personal computer is an 8080 based micro which is CP/M compatible. Joystick, printer and floppy discs are available and Hi Fi output is possible. The supplier is **Data Applications (UK) Ltd**, Personal Computer Division, 168 Dyer Street, Cirencester, Gloucestershire GL7 2PF.

APPLE IIe

£845

MEMORY	64K RAM	16K ROM
LANGUAGE	Applesoft BASIC	
CASSETTE	Yes	
DISC	Yes	DOS DOS 3.3
KEYBOARD	QWERTY✓	CURSOR✓ NUMERIC□ FUNCT□
DISPLAY	TV✓	MONITOR✓ SUPPLIED□
INTERFACE	PARA✓	SERIAL✓ BUS✓
GRAPHICS	BLOCK✓	USER□
	LINE✓	RES 280 by 192
	COLOUR 16	TEXT 24 by 80
SOUND	✓	

Notes: The Apple IIe is a 6802 A based micro, an enhanced version of the popular Apple II. It can be expanded to 128K RAM and a large amount of software is available. A wide variety of peripherals can be added. The supplier is **Apple Computer (UK) Ltd**, Eastman Way, Hemel Hempstead, Hertfordshire HP2 7QH.



SHARP MZ-80B

£899

MEMORY	64K RAM	2K ROM
LANGUAGE	BASIC (on tape)	
CASSETTE	1800 baud built-in	
DISC	Extra	DOS
KEYBOARD	QWERTY✓	CURSOR✓ NUMERIC✓ FUNCT□
DISPLAY	TV□	MONITOR□ SUPPLIED✓
INTERFACE	PARA□	SERIAL□ BUS✓
GRAPHICS	BLOCK✓	USER□
	LINE✓	RES 320 by 200
	COLOUR□	TEXT 25 by 80
SOUND	3 channels	

Notes: The Sharp MZ-80B is a Z-80A based micro. Various other languages can be loaded as the machine is "soft", no language being fitted in ROM. Expansion unit, the MZ-80PS printer and the MZ-80FB floppy disc drive are also available. The supplier is **Sharp Electronics (UK) Ltd**, Thorp Road, Newton Heath, Manchester.

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