

P E R S O N A L

EVERY THURSDAY

COMPUTER

45p SEPT 1-7 Vol 1 No 26

NEWS

THE COMPLETE COMPUTING WEEKLY

THIS WEEK

DARING DEEDS

All you need to know
about adventure programming

BBC SOFT OPTIONS

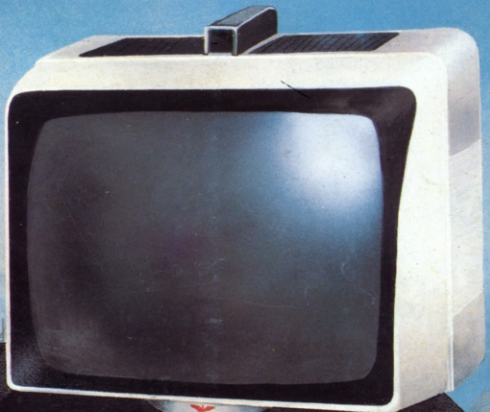
Write your own language
with the new BCPL package

THE 64 SERIES

Pull-out Micropaedia puts
the Commodore 64 in focus

TI MEMORY

How to use mini-memory
modules on the TI 99/4A



EVERY WEEK

PCN GAMEPLAY
We put games for top
micros to the test

PCN MICROWAVES

Your hints and tips published here

**Microtan –
The DIY Micro returns**

AQUAPLANE
Acquatic Action!!
 from the Author of Time Gate

FREE UNIVERSE WITH EVERY TAPE*

*OFFER SUBJECT TO AVAILABILITY



VELNOR'S LAIR

Lose yourself in the Goblin Labyrinth amongst Demons, Trolls, Undead and the Evil Wizard Velnor.
 A Warriors and Wizards Sword and Sorcery Adventure.
 Runs in 48K on the Spectrum.
 Author:
Derek Brewster
 of Neptune Computing
£6.95



3D STRATEGY

A Monster of an Unbeatable game! A 'State of the Art' program. A battle of Nerves and Wits. Faster than a speeding bullet!! 100% machine code version of 3D noughts and crosses. Runs in 16K on the Spectrum.
 Author:
Freddy Vachha
£6.95



XADOM

Battle through a sophisticated alien maze in a search for the 'antifact'. A Unique 3D Arcade Adventure.
 Runs in 48K on the Spectrum.
 Author:
Mike Moscoff
£6.95



PICTURE PRODUCED WITH 'BEEB ART' BEEB ART

High Quality Art/Design program for full versatile manipulation of the BBC's extensive graphics ability. Paint, Draw, Abstract. Instruction Book Included.
 Runs in 32K on BBC Model 'B'.
 Author:
Dave Mendes
£14.95



SMUGGLERS COVE

Falling through a concealed cave entrance you find yourself caught in a fable full of horror and Black Beard's Treasure...
 An Historical Adventure with Hi-Res Graphics. Runs on 48K on the Spectrum.
 Author:
John Keneally
£6.95



AQUAPLANE

Ski thru 'Marine Maniacs, G & T's, Regattas but beware the Great White Hungry!! Unbelievable full screen display, continuous sound, 'impossible' colour. Runs in 48K on the Spectrum.
 Author: **John Hollis**
£6.95



AQUAPLANE 48K Spectrum	£6.95 <input type="checkbox"/>
XADOM 48K Spectrum	£6.95 <input type="checkbox"/>
VELNOR'S LAIR 48K Spectrum	£6.95 <input type="checkbox"/>
SMUGGLERS COVE 48K Spectrum	£6.95 <input type="checkbox"/>
3D STRATEGY 16K/48K Spectrum	£6.95 <input type="checkbox"/>
BEEB ART 32K BBC Model 'B'	£14.95 <input type="checkbox"/>

THE GAME LORDS

PLEASE SEND ME THE GAMES AS TICKED SUPPLIED ON CASSETTE
 Total cheque/P.O. enclosed _____
 Cheque payable to Quicksilver Limited
 NAME _____
 ADDRESS _____

WARNING: These programs are sold according to QUICKSILVER Ltd's terms of trade and conditions of sale. Copies of which are available on request.

Please send order to
QUICKSILVER
 Palmerston Park House,
 13, Palmerston Road,
 Southampton SO1 1LL.

Send S.A.E. for Catalogue. QS Games are available through Boots, J. Menzies, Smiths, Hamleys, Laskys and all leading computer stores.



Pull-out and keep Micropaedia Commodore 64: Part 3

Peripherals, interfaces, sound, graphics and a look at books for your micro.

REGULARS

Monitor

2

Acorn user exhibition report, page 2; versatile disk system for Jupiter Ace, page 3; Commodore trims business system prices, page 4; Grundy looks for Newbrain lifeboat, page 5; £95 for an Osborne 1? page 6; and programmers win some protection, page 8.

PCN Charts

10

Changing fortunes in the micro world plus the best-selling games.

Random Access

13

Readers' letters — your chance to comment or complain.

Routine Inquiries

14

Whatever your problem, we might have the answer.

Readout

16

The new books reviewed.

Microwaves

17

Had a bright idea? Share it with your fellow enthusiasts.

Program Cards

54

In six pages we complete Euro Atlas on the Lynx, begin Asteroid Lander on the Dragon, and feature utilities for the Oric and BBC 'B'.

Clubnet

69

Where to find like-minded enthusiasts.

Databasics

73

Guide to the best-selling software.

Billboard

81

Quit/Datelines

88

Cover illustration by Paul Tupling

PCN SPECIALS

Texas arranger

20

Stephen Shaw demonstrates how the TI Mini Memory Module can make your programs in TI Basic more interesting.

Magic and micros

22

Whatever your computer, write your own adventures with John Noad's swashbuckling series. First of three parts.



PCN PRO-TEST: HARDWARE



Raising the Microtan

26

GE Chkiantz reviews the Microtan 65, a DIY micro the users saved from extinction.

PCN PRO-TEST: SOFTWARE

BBC variations

33

If you'd like to learn more about languages, how about writing your own? Richard King tests BCPL, a package for the Model B that could let you do just that.



PCN PRO-TEST: PERIPHERALS

Trace the Acorn

38

Richard Blue and David Summerfield outline a digital tracer for the BBC Micro.



Wide screen Pet

41

Is your 40-column CBM cramping your style? Henry Velleman reports on a plug-in board that will double your screen space.



Oric stick-up

43

David Janda gets his hands on one of the first joystick interfaces for the Oric.

GAMEPLAY

Adventuring on the Spectrum with Magic Mountain and Smuggler's Cove.

48

Plus... a round-up of some of the latest releases for the Spectrum.

49

Danger zones on the power grid in Matrix (Commodore 64) and in Ninja Warrior's stamping ground (Dragon 32).

51

Strategic moves with Dallas on the Oric and Call to Arms for the IBM PC.

52

CHARACTER SET

EDITORIAL: Editor Cyndy Miles **Deputy editor** Geoff Wheelwright **Production editor** Keith Parish **Managing editor** Peter Worlock **Sub editor** John Lettice **News editor** David Guest **News writers** Ralph Bancroft, Sandra Grandison **Hardware editor** Max Phillips **Peripherals editor** Ian Scales **Features editor** Richard King **Programs editor** Ken Garroch **Listings editor** Wendie Pearson **Editor's assistant** Harriet Arnold **Art director** Jim Dunsie **Art Editor** David Robinson **Art editor** Poyd Savers **Publishing manager** Mark Eizen **Assistant publishing manager** Sue Clements **ADVERTISING:** **Advertisement director** John Cade **Group advertisement manager** Duncan Brown **Advertisement manager** Nic Jones **Assistant advertisement manager** Mark Satchell **Sales executives** Ian Whorley, Christian McCarthy, Marie-Therese Bolger, Jan Martin, Julia Dale, Dik Veerman **Production manager** Eva Wroblewska **Advertisement assistant** Jenny Dunne **Subscription enquiries** Gill Stevens **Subscription address** 53 Frith Street London W1A 2HG 01-439 4242 **Editorial address** 62 Oxford Street London W1A 2HG 01-636 6890 **Advertising address** 62 Oxford Street London W1A 2HG 01-323 3211 **Published by** VNU Business Publications, Evelyn House, 62 Oxford Street London W1A 2HG © VNU 1983. No material may be reproduced in whole or in part without written consent from the copyright holders. Photographed by Quickset, 184-186 Old Street, London EC1. Printed by Chase Web Offset, St Austell, Cornwall. Distributed by Seymour Press, 334 Brixton Road, London SW9, 01-733 4444. Registered at the PO as a newspaper

Cue-in the Electron

For Acorn, the Acorn User Exhibition at London's Cunard Hotel will be memorable for the launch of the Electron. But for the rest of us the most lasting memory could be the interminable queue to get in.

Once inside, there were all the features that make these events so delightful — high temperature and

humidity, walkways designed as single-track roads with passing places, and a ground plan with as much pattern as a broken jigsaw puzzle.

These complaints are only trivial if you didn't attend. The show, after all, should be for your benefit as much as for the exhibitors, and when you've made the trip to Hammersmith, queued and paid, you're entitled to expect some attention. Instead what you find is that the organiser's main concern appears to be to get as many of you

through the doors as possible.

The show was split, part of it on the ground floor and part on the mezzanine. Having queued to get in downstairs you had to queue again to get upstairs.

If you were deterred by the second queue you may have missed the best of the show. There was no single star, although the Electron was undoubtedly one centre of attention. But as in Manchester earlier in the summer (*PCN*, issue 17), there was a wealth of add-on equipment for the BBC and the

Electron. It's a vindication of sorts of private enterprise — the Electron as launched looks limited where software and peripherals are concerned, but the independent suppliers have filled in the holes.

And while they give the Electron a promising start in life, they continue to add to the BBC's repertoire. Several companies, including Pace with a 10Mb hard disk, had disk systems on show for the BBC micro. There is a certain irony in this — Acorn must have looked on the exhibition as a showcase for the Electron, but the BBC took most of the limelight.

Cumana had slim-line drives on show, 5¼in models that sat elegantly alongside its previous full-height versions; elegance may be the key words where this company is concerned because it is about to step out of the BBC micro's shadow and move into the High Street on its own account, complete with fresh corporate identity and logo. Acorn, with its attractive but hackneyed dolly birds, could learn a thing or two from this line as well.



No Entry to the show?



Well, not without standing in a queue for three-quarters of an hour.

Extras for the new baby

The official launch of the Electron brought few clues as to when Acorn will have the extras to make it a complete system — but some of them turned up at the User Exhibition.

During the launch an Acorn spokesman predicted: 'Someone will beat us to it.' Sure enough, at the show two days later was one of the most crucial Electron extras — a Teletext Mode 7 adaptor that will

Electron cocktail served at the launch will not be generally available for another six months.



Cole Robotics' Armdroid showed off its five axes of rotation on the Laserbug stand.

Pace disk steps out

Pace Disk Systems launched a 10Mb hard disk and the E-Net networking system in a set-up intended for people in education.

Costing just under £2,000, the system gives up to 200 BBC users access to a central disk store. It uses the network interface in the BBC, so that if you are already using a networked system you can transfer to E-Net by fitting a new ROM and installing the hard disk.

Further hard disks can be added, and the command structure of the network permits you to assign a machine as the 'master' with the rest as 'clients', a novel euphemism for the teacher/pupil relationship.

Pace is based in Bradford on (0274) 729306.

The plot thickens

A low cost plotter is due out in September for the BBC micro and will soon be available for other micros too, including the Dragon.

The £283.50 plotter comes complete with cassette software, manual and three pens and can be used to draw anything from geometric shapes and graphs to electronic circuit diagrams. Aimed primarily at education, but suitable for other uses, it has a drill and light sensor and sheets of up to A3 size can be mounted on the plotter's bed.

The plotter is operated by two motors controlled by signals from the micro, driving a small carriage above the flat bed, and will be available only direct until a dealer network is set up.

Parfitt Electronics is in London on (01) 348 1973.

Lightpen at last

The long awaited lightpen from RH Electronics, Cambridge, is now at Acorn dealers, and is available direct for £45.95 including VAT.

The lightpen connects to the BBC, letting you draw lines on the screen or give commands by pointing to a menu. You can also fill in colour with the pen, which is a bit bigger than a felt tip. It has a microswitch and LED lamp, both fully programmable.

It can be adjusted to suit the type and thickness of your screen, and

comes with a package consisting of interface unit, introductory cassette software and user guide. The software is geared to help you adjust the pen, program the microswitch and LED, and draw on the screen.

Additional software is planned to enhance the pen's capabilities, while the company already has seven new games out, available at Acorn dealers. Prices for these range between £4.95 and £8.95 and a 40 track disk version of lightpen software can also be bought for £5.75.

Master Class, which produces video learning cassettes, has three video cassettes out teaching you how to use the BBC — BBC Introduction and Primary, BBC Basic 2 and BBC Basic 1. One is out for the Electron and two others, about the Spectrum, will be on sale from Smiths as from September. The company hopes to build up a family of ten cassettes for the BBC, and there will be more for both micros in the future.



Electron corner on the Acorn stand, enable Electron users to run much of the games software produced for the BBC.

Acorn itself plans to have a second processor for the system next year, and an expansion unit that will include a sideways ROM facility, a cartridge port, RS423 and Centronics interfaces, and an analogue/digital converter.

When this will appear is a moot point. Rumours suggest that even the ingredients for the livid green



There were BBC buggies aplenty — this one was £165 from SD Computers.

Disk mix for Ace

An adaptable, if expensive, disk drive, unit is due out for the Jupiter Ace and the Dragon in September from an independent peripherals maker.

Designed and built by Microprocessor Engineering of Southampton, Jet Disk is intended as a universal floppy disk controller. Its system box contains the power supply, one or two internal 3in disks, and the controller board. From this you can hang four further drives.

Marketing manager Steven Pelc says the system will take 3 1/4in, 5 1/4in or 8in drives, which can be single of double density and single or double sided, with any mixture of them running at any one time.

One 3 1/4in drive will store 180K and will cost £300, while a second one will be £131.75. Alternatively, you can buy the controller board, interface cable and software for £109.25, enabling you to build your own interface.

Mr Pelc explained: 'If you want to supply your own disk drives instead of buying the box and its power supply, you can buy the guts for it instead, and make your own.' This alternative, he said, would be the obvious choice for people owning micros the company doesn't support.

'The good thing about the system

is the fact that if you change computers, you don't have to buy new disk drives. All you would really need would be a new interface cable and new software,' said Mr Pelc, who added that new software would come out with the Dragon version.

At Jupiter Cantab, marketing manager Geoffrey Walker said: 'We may market these drives, depending on demand.'

On the software side, Mr Walker said Jupiter Cantab was thinking of taking over the Remsoft catalogue.

Versions of Jet Disk for the Jupiter Ace and the Dragon will be on sale direct from Microprocessor Engineering in September, and the

company is developing it for the Spectrum as well as other micros. It can be contacted on 0703-775482. Microprocessor Engineering's systems sidesteps the problems generally encountered by the read/data separator system. The Jet Disk's arrangement, known as a digital phase-lock loop, doesn't require you to get involved in setting it up and the manufacturer says that it will never drift, giving you fast and reliable disk reads.

The board can be set up to be driven by any micro — on-board ROM and RAM sockets take the driver software and Disk buffer for the machine to which the Jet Disk is attached.

CP/M maker casts net into homes

Digital Research, producer of CP/M, is all set to out-maneuvre Microsoft and its MSX hard/software standard and clean up in the home software market.

The company is due this week to announce products that will spearhead its push into front rooms and kitchens all round the world.

At the core of its strategy is a wide range of operating systems and applications software that will allow programs to be written to run on all home computers.

With its own consumer software the company is aiming away from what it sees as a saturated games market.

'Surveys in the US have shown that people are tired of games and they are now looking for more serious home and educational applications,' said Paul Bailey, director of European operations for Digital Research.

The kind of thing that would be included in the company's range of programs are recipes, diaries and home finance. All the programs should sell for under £30.

To develop its involvement in home computing, Digital Research has set up a new consumer products division to be led by Kenneth Harkness, who was previously president of Atari's arcade division.

Stars of the late show . . .

■ Dragon's own disks (PCN, issue 26) are also due next month, substantially later than originally planned.

Dragon is far from being the only micro maker to have had trouble working disks into its catalogue. This is the roll of honour so far:

Computers — Disk drives for the Lynx were due in June (PCN, issue 9).

Oric — Seven weeks ago Oric was advertising 3in micro floppies 'with-in the next few weeks.'

Other notably late products and services include:

BBC/Acorn — The Ceefax teletext service should have begun in early May.

Acorn — Cartridge software was due in mid-June.

IBM — The XT version of the PC should have been here in quantity in June.

Advance — The IBM-compatible Advance 86 was due June/July.

Laser — Expected in the shops in July.

Corona closes printer gap

By Ian Scates

It seems that even the printer distributors are paying great attention to the price performance gaps which appear on PCN's Printer Pic Charts.

The Smith Corona TP1 printer came off the worst in the recent PCN round-up of daisywheel printers.

The major TP1 distributor, Discom Trading Company, decided to lower the price!

The Smith Corona TP1 is now selling at a very reasonable price of £399 including VAT, a drop of £159 from its former price of £558 including VAT. The company says the decision to drop the price was a direct result of our price/performance gap judgement.

'I was sitting in the hairdressers, browsing through PCN,' said Stewart Bell, Discom's marketing manager. 'I saw the price/performance gap and decided "fair enough", so we dropped the price.'

The company has advised its dealers of the decision so don't pay any more than you have to — our commiserations to those who went and bought the Smith Corona before the adjustment.

Mice on the loose

By Ian Scates

Mice are beginning to infest the IBM PC — it's almost a plague. The publicity surrounding the launch of the Apple's Lisa has generated enough awareness in micro users to make add-on-mice products sellable items.

But the mice available so far come without all the software that made the Lisa such an exciting development.

A mouse is a little hand-sized device connected by a cable to the computer (mouse-tail). By moving it across a flat surface it uses either a roller ball or a bar-code type system on a grid, to move the cursor about the screen. This gives you a concrete way of positioning yourself on the display. Instead of fiddling about with cursor keys, you just move the mouse. It usually has two or three buttons on it as well so you can execute options once you get the cursor where you want it.

PCN will run a special two-part Pro-Test in issues 27 and 28 on two of the mice so far available for the IBM PC. Mouse Systems' Optical Mouse costs £297. It is said to be able to work with just about any applications program for the IBM PC and comes with a set of utilities

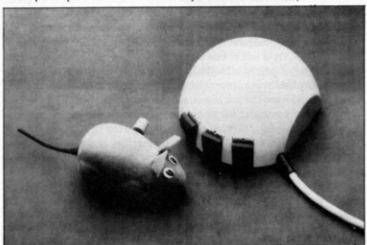
to configure it properly. This one uses an optical reader system and must be used on a special pad where the location information is encoded.

Our other mouse is courtesy of Logitech.

This product uses the alternative of a ball under the mouse to send cursor movement information to the computer. It can be used on any position on a desk top — you don't have to worry about positioning it on a special pad.

Whether these mice are actually worth the considerable sums they cost will be the subject of our second mouse Pro-Test special in issue 28.

Meanwhile the standard-bearer for the legion of mice steadily advancing upon micro-users, the Lisa, is also spawning imitators in other directions. The concept of an integrated software package has been taken up by Vision and Quarterdeck for MSDOS/PC DOS systems, and by individual companies such as Torch.



Logitech's mouse — not spending too much time behind the skirting board.

VIEW FROM AMERICA



War Games babies on the increase

By Chris Rowley

Some things seem dreadfully predictable, even in the fast paced world of microcomputing. For instance there are now surveys that show that, in addition to fear of maths, American girls have a fear of computers. Microcomputers are just 'a boy's thing' apparently. Reaction against computers is strongest in Valley Girl country where anything that involves the use of the brain is decidedly unfashionable this summer.

Equally predictable is the national panic concerning computer vulnerability to pranksters and criminals through phone links and data networks. The surprise summer movie hit was War Games. As is often the way of these things, the movie broke just slightly ahead of the headlines concerning a team of ten teen-computer freaks known as the 414's, after the area code for Milwaukee, their home town.

The 414's began haunting phone-connected computer systems in mid-May, and by June they had logged ten hours' worth of such pursuits and games of blackjack on the big Dec Vax 11/780 at the Sloane Kettering Cancer Institute in New York. To get into the 60-odd systems they succeeded in penetrating, they used the relatively simple manufacturer's 3-digit code words.

Many large system buyers retained such codes after installation to make it easy for the repairmen to get into the system when necessary. Unfortunately the codes are just too easy to crack, and once inside the systems the 414's knew enough to call up menus and alter programs. They were finally apprehended when the computer minders at Los Alamos Nuclear facility noticed that a computer loaded with unclassified science abstracts was getting an awful lot of phone calls. The FBI then closed in on the Milwaukee gang, who now await some sort of retribution, having seen one of their leaders cop immunity in a squeal deal with the FBI.

Interesting irony, especially to Dec, whose machines were by and large the ones tampered with, the 414's arose originally from an eagle scout group sponsored by, you guessed it, IBM!

Public access through simple code is essential for the vast data nets that are spreading through the American business/educational complex. This is the heart of the new Information Industry, beacon of hope for US economy in the 80s. Indeed loads of expensive mainframes were bought in recent years solely for time sharing duties. But public access, which is growing mighty fast with declining prices of micros and modems, is a double-edged proposition.

Considering the spread of 'logic bombing' — a recent case in LA started two disgruntled programmers at a food distribution concern who phoned a program 'bomb' into the computer system controlling payroll and inventory for 400 Kentucky Fried Chicken franchises. The 'bomb' was timed to crash the main program and erase all memory one month after insertion.

Nor is the telephone the only weak link in US data control. In Virginia an enterprising gent was recently indicted for using a home computer and a microwave antenna to tune into microwave computer lines run by an Atlanta credit bureau. He is said to have ordered up to \$50,000 worth of stuff, right out of thin air as it were.

Yet this is just peanuts; for the big numbers you have to look upscale. To cases like that of the economist at the Federal Reserve, the source of all dollars. He used the name and access code of another employee to tap the Fed's computer for highly classified data concerning the US money supply — information worth millions to the right people.

Out in the research institutes and universities there's widespread computer security paranoia. In the past year there have been hundreds of cases of pranksters, extortion artists and serious spy operations getting into big university mainframes. One result of the growing fear is that sixteen companies are currently listed as offering twenty kinds of code devices to protect computer information. All banks have begun crash programs to encode as much information as possible and all Government agencies have been told to get serious about protecting what's in their computers.

Cuts at CBM

Following its price-cutting at the sharp end of the micro business with the Vic 20 and 64 models, Commodore UK has moved the price war up market, with as much as one third off the cost of its business machines.

From today (September 1) the 32K 4032 machine drops £200 to £495, the 80-column version drops £320 to £675 and a 2Mb, dual disk drive drops £400 to £895.

Printer prices have also been cut by as much as a third. For complete systems it means a 32K micro with dual disks and printer which would have cost you more than £2,700 last week should now cost only £1,985.

As a side effect, the price cuts make the Commodore 64 more attractive to would-be business

users. With the business range of peripherals you could build a system of 64K full-colour micro, 2Mb disk unit and a decent dot matrix printer for under £1,500.

Commodore has excluded its top-line equipment — the 256K 715, and hard disks — from the cuts, but the cost of the 700 has been trimmed 18 per cent to £650.

Mike Tait, Commodore's national sales manager for business systems, said: 'With the reduced prices Commodore is even more strongly positioned to further expand its established user base of over 110,000 business installations in the UK.'

The cuts coincide with a move to beef up the IBM dealer network.



Systematic reduction — prices of Commodore business set-ups are cut by an average of 25 per cent.

Trade Forum

The Autumn Computer Trade Forum could hold more interest for micro users this year than it has in the past.

Olympia plans to use the forum to give the first UK showing of its 'People's business micro, and Future Computers' EX30 with an integral hard disk should also be there.

Texas Instruments' Professional

will be present, and General Automation is expected to launch its Zebra range of small systems.

The Olympia machine, built around an 8086, may have unusual appeal because it will connect to the company's printers and typewriters. General Automation's Zebras are creatures of a different stripe, coming as stand-alone devices or in clusters of 32. They will also run the Pick operating system or Xenix.

Dawn delayed

By Richard King

More details of the proposed MSX home computer standard (PCN, issue 17) have emerged, but instead of representing a new dawn, it appears to be thoroughly mundane and rooted firmly in the past.

To conform to the MSX standard, a machine must have a Z80 processor, a Texas Instruments TMS9918A graphics controller and a General Instruments AY-3-8910 programmable sound generator.

In other words, an unremarkable processor, graphics which reach cartoon-quality, albeit with some nice bells and whistles, and three rather buzzy noisemakers.

More capable circuits are readily available at little or no more cost, and are just as easy to use. The NEC7220 graphics processor is a

good example and is used impressively in the yet-to-be-seen-in-quantity HH Tiger, among others.

There are better sound-generators, too — witness the BBC micro, which uses the Texas 76489 chip; it may be more complex, but it isn't impossible to program.

But the real peculiarity of the US/Japanese MSX spec is its concentration on particular chips. What's wrong with a set of 'driver-programs', which can accept some arbitrary but standard set of commands, and which translate those commands into the correct signals for any suitable alternatives?

There isn't anything new in that idea, either. CP/M uses it.

So the MSX standard won't make any material difference to what you'll see in the shops.

Newbrain to be saved?

'The directors have had no alternative but to take the necessary steps to wind up the company'

Tony Wheeler,
Finance director,
Grundy Business Systems

By David Guest

Newbrain manufacturer Grundy Business Systems is foundering with all hands — but so far there is no sign of a rescue attempt to save the stricken machine (PCN, issue 25).

The future of the machine that almost became the BBC micro hangs in the balance. Grundy directors are taking the 'necessary steps to wind up the company', and if a rescue is in prospect it looks more like a flotilla of small boats than a full-scale salvage vessel at the moment.

The company's finance director Tony Wheeler said last week: 'The directors are continuing to seek potential purchasers for the business.' No would-be buyers have yet come forward, but rumours are rife — an unnamed US company is said to be ready to step into the breach, and Thorn-EMI, which builds the Newbrain for Grundy, has also been mentioned as a possible buyer.

But the only verbal commitments have come from much smaller companies involved with the Newbrain either as dealers or software suppliers. If their interest is to be translated into action, it needs a co-ordinating effort of the kind the British Technology Group (BTG) could be in the best position to provide.



Development of the CP/M Newbrain and expansion units stretched Grundy.

The BTG owns 30 per cent of Grundy Business Systems, and the rest is owned by the Grundy Group, a diversified organisation that produces almost anything from beer casks to weapons control systems.

A BTG spokesman said: 'As far as we are concerned, we don't feel



Grundy Business Systems boss Robert Smith — the Newbrain is slipping from his grasp.

that we can put more money into the company. It's now up to the private sector to step in.'

The attitude of the Grundy Group has not been publicly expressed. It bought the Newbrain from Newbury Labs in July 1981 for an undisclosed sum, thought to have been close to £600,000 — perhaps significantly, the sale was negotiated by the BTG. Since then the Newbrain has established itself and generated a certain loyalty among dealers and users. But the Newbrain was a late birth (and this may have cost it the BBC's endorsement); the additional features —

a combination of factors: a decline in sales in the first half of this year and the delays in the appearance of the enhanced models.

'The demand from UK dealers and overseas distributors exceeded production by the end of 1982,' he said. 'Production plans were accordingly updated to meet an anticipated growth in sales in 1983, calling for a very substantial increase in working capital. From January 1983, however, sales in fact declined, a situation aggravated by the failure to meet the predicted dates for the introduction of enhanced features, including CP/M systems.'

Unconfirmed reports suggest that Grundy raised its production targets to 10,000 a month earlier this year, basing its predictions on pre-Christmas demand at the end of 1982. The same sources say that Thorn-EMI is still holding large stocks of unsold Newbrains, perhaps as many as 5,000, and that it has components for another 2,000 on its hands.

Ironically, the Newbrain was seen as a good investment in this same period. The BTG commented: 'In the last six to nine months quite a few companies have been looking at the BTG's holding with a view to buying our shares. But they lost interest when promised additions to the Newbrain failed to arrive.'

He added: 'With the release of the disk system there has been renewed interest from some companies who now see the Newbrain as a serious business machine.'

This could come too late unless

the interest can be channelled into a rescue bid, but it would certainly find support from other sources. Systems and software house Kuma last week said it might consider helping in a rescue attempt, and the Newbrain software specialist Elstree Computer Centre went further: 'We would certainly get together with other dealers to save the product, which is very highly rated

'You can't have such a high technology machine just stopping'

Alan Fish,
Elstree Computer Centre

by dealers,' said Alan Fish of Elstree.

'I see a big future for the machine because of its high technology,' he said. 'For example, the four character sets, 800K on each disk, and a full 80 column display. The disk system is superb. You can't have such a high technology machine just stopping.'

The system may have a future, but the prospects for Grundy Business Systems staff at Cambridge and Teddington are still uncertain. About 30 people are involved, and one told PCN they had been expecting the axe to fall since June. 'A lot of people have been going for interviews since then,' he said. 'It had been on the cards for a while.'

Osborne packs more software

In a special promotion lasting until the end of the year Osborne has brought its prices down to Spectrum level.

The face value of an Osborne 1, you are asked to believe, will be £95 for the rest of the year. But Sir Clive needn't spend too many sleepless nights — the Osborne will cost you £1,495 in a package that includes £1,400 worth of software.

Osborne already includes SuperCalc, Wordstar, CP/M, CBasic and MBasic in the price of its system. The new Osborne 1 Budget Office System will also include Personal Pearl and the Peachtree Business Management system.

Osborne has also repackaged the system to include a hard-disk ver-

sion priced at £2,995. This comes with the Trantor TSL-5.5Mb disk.

And the device that is mainly responsible for these measures, the Executive, is just appearing on the horizon. Since its launch, sales of the Osborne 1 have slumped so badly that Osborne has had to cut back by closing a manufacturing plant in New Jersey.

The Executive is also prompting software houses to bring out adapted facilities. One, 4B Microcentres, has launched a Development System for the machine — in the absence of Osborne's own promised development system.

4B (0295 50796) is selling the Executive plus its UCSD-Pcode development system for £2,395.

More in the business end of Apricot

ACT is beefing up the software to run on its Apricot, due to appear in the shops in October.

It has signed a deal with US software producer Sorcim, which will bring a range of business applications into its portfolio.

These include a new version of the word processor Superwriter

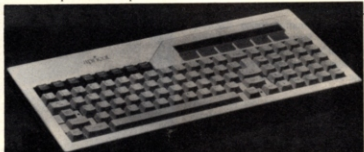
which features a spelling checker working off a 20,000 word dictionary.

It also has a merging facility that lets you print letters selectively or in bulk from a mailing list.

Supercalc 2 will be available for the Apricot as well. ACT says that its formatting has been improved and that it gives you a greater range of options in dealing with the worksheet on the screen.

Superchart is another newcomer to the ACT catalogue; this is a business graphics package.

ACT is on 021-454 8585.



ACT's Apricot — softening up for October launch.

Condor DBs land in UK

Condor has made it across the Atlantic to bring cheap relational database management to European users.

Produced by Condor Corporation, the system is presented as an introduction to sophisticated data-handling techniques. It runs on a variety of systems that includes the Sirius, IBM PC, Apple, Zenith and DEC.

Its distributor in this country, MOM Systems of Aberdeen (0224 571825), is selling it in three versions. At its simplest level it costs £95; for multiple-file work you pay £195 and for a system featuring report writing and similar functions you pay £295.

The first level can be upgraded to the third for £125.

HP loads Context into its Model 16

Hewlett-Packard has achieved something of a coup by offering Context MBA, an integrated business package that previously ran fully only on IBM systems, on its Model 16 business micro.

Developed by Context Management Systems, the package combines a spreadsheet, word processing, graphics, database management and telecommunications facilities. It includes 'windowing', so

that any of its functions can be called on to the screen at any time for analysis; and when a change is made in one part of the software it is automatically incorporated in the rest — even to the extent of graphs automatically re-drawing themselves.

Context MBA uses a workspace of 95 columns and 999 rows — and each cell can hold 8,000 characters. At minimum it needs 512K, but the two HP systems on which it runs offer up to 768K and 2Mb respectively — these are the Series 200 Models 16 and 36.

The package costs £593. Hardware from Hewlett-Packard doesn't come cheap either — an entry-level Model 16 costs £3,878.

It is based on the Motorola MC68000, and HP has also announced CP/M-68K.



Hewlett-Packard putting the Model 16 in Context.



ICE IN THE SUN — Flying the flag in one sense, Independent Computer Engineering (ICE) has sold £2½ million worth of equipment to Saudi Arabia. Saudi readers of PCN could soon be using British-built hard disk units, multiplexors and tape streamer back up units from ICE, which is based conveniently close to Heathrow airport at Ashford, Middlesex. But couldn't ICE have shipped its wares out on British Airways?

Techmar vow

Comart has promised not to cast asidrift anybody who bought Techmar peripherals from it.

The UK supplier severed its ties with the US peripherals company last week, but a spokesman said that it would continue to support users until Techmar finds another UK distributor.

But any orders already placed will be cancelled and Comart will refund any money paid. 'We will not let our customers down,' said David Slinn, Comart's marketing manager.

Techmar produces add-ons for IBM's Personal Computer. Last summer Comart, with a view to a long-standing relationship, signed an agreement to distribute Techmar's products in the UK. The agreement was announced in conjunction with IBM's PC launch.

Since that time Techmar has expanded. 'I believe that this expansion is part of the trouble,' said Mr Slinn. 'The company has obviously had problems with manufacturers, resulting in vast product delays.'

Comart has had difficulty in obtaining promised supplies for UK orders. Some products have taken up to six months to appear. Comart has therefore been unable to give delivery dates, leading to bad feeling with customers. 'We have a reputation to protect,' said Mr Slinn.

Comart believes that Techmar will eventually sort out its problems.

Caroline Alpert, vice president of Techmar, said she feels that the break-up is beneficial to both parties.

QUESTION

WHERE CAN I BUY

NEWBRAIN 'A' 32K	FOR	£268.00
NEWBRAIN 'AD' 32K	FOR	£298.00
SINCLAIR ZX81 1K	FOR	£39.00
SINCLAIR SPECTRUM 16K	FOR	£99.00
SINCLAIR SPECTRUM 48K	FOR	£129.00
ORIC-1 48K	FOR	£139.00
SINCLAIR ZX PRINTER	FOR	£39.00
SINCLAIR ZX81 RAM PACK	FOR	£28.50
SEIKOSHA GP-250X PRINTER	FOR	£260.00
SEIKOSHA GP-100A PRINTER	FOR	£215.00
SANYO SCM12H GREEN MONITOR	FOR	£100.00
SANYO SCM12N GREEN MONITOR	FOR	£85.00
BMC BM12E GREEN MONITOR	FOR	£100.00
JUKI 6100 DAISYWHEEL PRINTER	FOR	£458.00

CARRIAGE: 1 item £4.00, 2 items £3.50 each, 3 items £3.00 each, 4 or more FREE

ANSWER:-



WHY NOT COME IN AND SEE US
AT OUR NEW SHOP
44 NEW BRIGGATE, LEEDS 1
NEXT TO THE GRAND THEATRE

MICROCELL COMPUTER SYSTEMS

New Brain

APPOINTED STOCKIST

FOR ACCESS AND BARCLAYCARD PHONE ORDERS, PLEASE RING (0532) 449722

MICROCELL COMPUTER SYSTEMS, 44 NEW BRIGGATE, LEEDS 1, YORKSHIRE

NAME _____

ADDRESS _____

SIGNED _____

FOR OUR COMPLETE PRICE LIST

PLEASE TICK ☐ PLEASE DEBIT MY ACCESS/BARCLAYCARD NO

PLEASE SEND ME

TOTAL £
+ CARRIAGE £
TOTAL ENCLOSED £

CTA to cover authors

The Computer Trade Association (CTA) is extending its clean-up campaign to bring software writers under its protection. After spawning the Guild of Software Houses (PCN, issue 24) to give consumers the protection of a code of conduct, it is aiming to bring software producers under a similar umbrella.

The CTA aims to encourage program authors to join in order to set up a professional body of specialised advisors to be called the Society of Software Authors.

Questions already being raised include the matter of whether the software industry is concerned with manufacturing or service. The dif-

ference is quite significant: if you're setting up a manufacturing business you are eligible for one of the highest types of Government grant. This could mean that your first year's rent and rates are free. But if you are setting up a service then this does not apply.

Conversely, anybody writing software from home can only receive monetary assistance if he can prove he is performing a service.

The CTA is aiming to come to an arrangement agreeable to both parties.

It is also setting up a system to monitor all software sales in order

to enforce royalty payments — 'Unscrupulous software houses have been dodging these royalty payments' said CTA general secretary Nigel Backhurst.

Commenting on an article in PCN, issue 21 regarding the CTA's plans to protect consumers against mail-order software houses that don't deliver the goods, a small mail-order company, K-RAM, pleads: 'Don't tar us all with the same brush.'

The CTA suggests all software houses take out bonds with insurance companies to ensure that suppliers meet their orders within 56 days or return the customer's

money. Mr Backhurst said: 'If they can't afford to be bonded they shouldn't be in the mail-order field.'

K-RAM agrees that the cost of £50 for a small company seems a fair deal. However, it feels that the suggestion that only leading mail order companies should be approached to implement controls by means of a conference appears unreasonable.

Part of the CTA's activity recently is little more than a recruitment drive, but it is encouraging to see that some common problems are being addressed in the process.

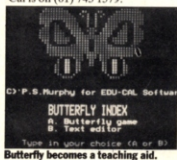
Spelling Beeb

What would Wackford Squeers have made of it — children being taught by a computerised and strictly non-violent butterfly flitting around a screen gathering letters?

This is how a new educational program from Edu-Cal works. For primary school children, it has a butterfly which you guide around the screen collecting numbers and letters to make certain key words.

It runs on the BBC Model B and you can use joysticks as an alternative to the keyboard. Before practising flight simulation with the butterfly you can use another part of the program to develop word lists, stories or mathematical equations for the body of the program.

On cassette Butterfly costs £12.50, and on disk £14.50. Edu-Cal is on (01) 743 1579.



TI and Vic 20 deal for Ketts

Owners of Texas Instrument and Vic 20 machines will soon be able to buy software from the local electrical goods shop.

The Ketts chain, which has shops in the Home Counties and the south of England, is following Rumbelows into the software business in a deal with Websters Software.

It will concentrate on software for the TI and Commodore systems, these being the two types of hardware that it supports.

Ile VisiCalc advancement

Visicorp's VisiCalc Advanced Version is now available in the UK for users of the Apple IIe.

The jazzed-up VisiCalc has been out for the Apple III for some time but it has only just been announced by Rapid Terminals (0494 26271) on the IIe. In addition to a standard VisiCalc it will give you variable column-widths, extra help features and the ability to reflect base figures from one worksheet through a number of other worksheets held on disk.

A keystroke memory is also included so that you can set off multiple keystroke operations from a single key depression. Various calculations and output facilities are enhanced in the advanced version.

You'll need at least 128K and a floppy disk, and Rapid recommends — perhaps superfluously — that a printer would be a good idea to get the best out of the software. VisiCalc Advanced Version will set you back £319 from dealers throughout the country.



ZIP FIRELIGHTER — Despite an apparently burnt-out case, the ZIP printer pictured here is still working. According to its manufacturer Data Dynamics, it was involved in an accidental warehouse fire and survived to print out its own tale. Proof, its makers believe, that it is a hot prospect for rough industrial usage. It could be the ideal output partner for DVW's portable Husky, which can often be seen at trade shows operating quite happily under water with only a fish for company.

Executive micro flop

You may regard it as the worst of both worlds but at least you'll have time to prepare for it; by 1988 60 per cent of executives will be working from home.

This figure is culled from a survey by Beta Exhibitions, which also finds that despite the micro boom only one in every two top companies understands the possible impact of technology on its activities. Plenty of them use photocopiers, electronic typewriters and word processors but micros come fourth, and barely 16 per cent intend to invest further in them.

By 1988 this figure may have increased, with the result (again

according to the Beta survey) that offices will have become more congenial places to work — if you are among the other 40 per cent you will be there to appreciate it.

Those working from home will be taking advantage of networking, electronic mailing, and — presumably — cups of real coffee instead of vending machine sludge.

The survey covered 255 of the companies listed in the Times 1000 and Jordan's 'Britain's Top 500 Electronic and Electrical Companies'. These are the very people that the builders of small business systems and PCs that can serve as mainframe network terminals are

trying to lure, and it must be a blow to the manufacturers that only half of them understand the potential of the technology.

Bill Cottle, chairman of Beta, said: 'Given the commercial importance of our sample and the fact that the UK is increasingly an office-based nation, the survey makes worrying reading.'

He takes heart from the wide-spread plans to install networks, but adds that too many senior executives don't get close to technology — 'In 37 per cent of our top companies directors were not involved in the purchasing of computers.'

BACK ISSUES

Issue 1, March 11-18.

Pro-Tests: Apple's Lisa, Text TX8000; Spectrum speech synthesiser, Apple printer, Commodore network, ID on Spectrum, graphs package for Apple and IBM, BBC graphics system.

Features: computer chess, Occam parallel processing language, Vector Sirin function keys.

ProgramCards: Towers of Baramah (Pascal), Biorhythm (Apple II), Roman Year (Apple II), Shape Utility (Apple II), Shape Utility (Apple II), Soccer (Atari), Castle of Kiddles (BBC Model B), Pimania (Spectrum), Flight Simulator (IBM PC).

Databases: micro and peripherals.

Issue 2, March 18-25.

Pro-Tests: Toshiba T1200, Casio PB100, ZX81/Basicare, Vix speech synthesiser, Spectrum spreadsheet, IBM graphics, BBC word processing.

Features: ColecoVision, micro baggageman, nursery computing, **Gameplay:** Ultima II (Apple), Trader (ZX81), Starquest (Vic 20), Hungry Horace (Spectrum).

ProgramCards: String editor (Spectrum), Analogue clock (BBC Model B), Chart generator (Spectrum), String extract/replace.

Databases: full software listings.

Issue 3, March 25-April 1.

Pro-Tests: TI Professional, Apple speech synthesiser, Facit 410 printer, IBM keyboards, Petpsed compiler, Sirin toolkit, Dragolance.

Features: Atom upgrade, Lynx programming, Apple music, **Gameplay:** Mangrove (Vic 20), Mutant Herd (Vic 20), Compendium (Dragon), Patience (Spectrum), Noughts and Crosses (Dragon), Great Britain Ltd (Spectrum), Ulysses (IBM PC).

ProgramCards: Magnify (Spectrum), Spider (Vic 20), Firing Range (BBC).

Databases: micro.

Micropedia: Anatomy of the BBC, part 3.

Issue 4, April 1-8.

Pro-Tests: Pip Piper Communicator, Olympia ES7000 printer, Namsi Superkatal, Commodore Calcsult, Spectrum Pascal, Cashback (Dragon).

Gameplay: Dark Crystal (Apple II), St. George (Dragon), Wizard War (Dragon).

ProgramCards: Fruit Machine (C64), Tunesmith (Oric), Array Editor.

Databases: peripherals.

Clubnet: Clubs and user groups, **Micropedia:** Go forth, part 1.

Issue 5, April 8-15.

Pro-Tests: Commodore 700, Ikon Hobbit, 1-2-3 (IBM), ZX81 machine code.

Features: speech packs, monitors, **Gameplay:** Grand Prix (Dragon), Derby Day (Spectrum), Deadline (Apple).

ProgramCards: Wacky Racers (Oric), Fruit Machine (C64), Pansie Inter.

Databases: Software.

Clubnet: full list of user groups, **Micropedia:** Go forth, part 2.

Issue 6, April 15-22.

Pro-Tests: Tycom Microframe, IBM PC, Scorie Disks, Dragon sound module, ZX81 graphics, Bottom Line Strategist (CP/M), PaperClip word processor.

Features: IBM PC DOS, BBC word processing, PC-1251.

ProgramCards: Mines Out (Spectrum), Transylvanian Tower (Spectrum), Lunar Leaper (Apple II), Evolution (Apple II).

ProgramCards: Wacky Racers (Oric), Mortgage Comparison (Sharp M208K), Computer Set Up (BBC), Day of Week.

Databases: micro.

Micropedia: Graphics, part 1.

Image: A computer monitor displaying the word "COMPUTER" in a stylized font.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Image: A computer monitor displaying a game scene with a character and a dragon.

Micropedia: Sound, part 1.

Issue 18, July 7-13
Pro-Tests: Tandem 100, RS232 interface (ZX81), ROM page (Commodore), Interface printer buffer, IBM Personal Basic, Spectrum assembler, Newbrain WP.

Features: Leaving Part 2, Lynx music.

Gameplay: Spectrum Backgammon, BBC Snooker, Commodore 64 round-up, Serpentine (Vic 20), Post (Spectrum), Spectrum Safari, IBM Personal Basic, Spectrum assembler, Newbrain WP.

Micropedia: Sound Part 2.

Issue 15, June 16-22.

Pro-Tests: Com 35, Address Manager (Spectrum), Syntex (Commodore 64), MST Database (Epson HX-20), Voice Input Module (Apple II).

Gameplay: Cleared for Landing, Playing the Ace (Apple II), Vultures, Star Jammer (Dragon 32).

ProgramCards: Mover (BBC B), Sprite Clock (Commodore 64), Pirate Island (Atari), 3 of 9, Micro-mind (Colour Gene), Brickbat (Dragon 32).

Databases: Hardware.

Micropedia: Spectrum, part 2.

Issue 19, July 14-20.

Pro-Tests: 16-bit chips, Stock control (Epson HX20), Malpas (Torch), Smith-Corona daisy-wheel, ZX81 word processing.

Features: Insurance, buying second-hand.

Gameplay: Escape MCP (C64), Escape from Perilous (Atari), Apple round-up, Temple of Apshe (C64), Airline (Spectrum), Heathrow (Spectrum).

ProgramCards: Colour Code (Atari), Wreck (Dragon).

Micropedia: Sound, part 3.

Issue 20, July 21-27.

Pro-Tests: Rade board, Vic digital tape drive, Seikosha colour printer, Toolkit (Spectrum), Bonus (Pet payroll), Newbrain monitor.

Features: Computer art, Dragon scrolling.

Gameplay: Rabbit Trail (T199/4a), Acres Challenge (Atari), Vic 20, T199/4a, BBC round-up, Joust (Spectrum), Molar Mini (Spectrum), Time-Lords (BBC).

ProgramCards: Tumbler (Oric), Wreck (Dragon), Atari Errors, Speed Race (Vic 20).

Micropedia: Sound, part 4.

ORDER FORM

Any one issue is 75p, additional copies 55p, post & packing included. Overseas readers please add £1 per copy airmail postage. Please allow up to 21 days delivery.

Name..... Telephone (day).....

Street.....

Town..... Post Code.....

Please send me..... Issues of PCN, issue nos.....

I enclose my cheque/PO

made payable to Personal Computer News or please debit my credit card:

Visa/Access/Master/Diners

Card no..... Signature.....

ELIMINATE FAULTY CASSETTES

DataClone is the first company in the UK established specifically for the duplication of data cassettes.

All other duplicating houses are audio oriented — only DataClone has a duplicating system designed from scratch purely to handle computer information.

The result?

Greatly improved reliability in data transfer rates from 300 to beyond 2400 baud — previously unattainable.

All formats catered for. Quantities from 200 to infinity.

Contact us now for brochure.

DataClone — the first specialist service for computer cassettes.

DATACLONE HAS
EXPANDED, PRODUCING
AN EVEN FASTER
TURNAROUND. NOTE
NEW ADDRESS.



DATACLONE
UNIT 1
ROSLIN SQUARE
ROSLIN ROAD
ACTON, LONDON W3
TEL: 01-993 2134
TELEX: 21879

PCN Charts

You've followed the micro charts — now here's the games top 30 compiled from both independent and multiple sources across the nation. They reflect what's happening in high streets in the two weeks up to August 18 and, like the micro charts, do not take account of mail order sales.

The micro charts this week show the number of machines sold in the two-week period ending two weeks before publication date, so they tell the story in the high street



GAMES

Top Thirty



		GAME TITLE	PUBLISHER	MACHINE	PRICE
▶	1 (1)	Jet-Pac	Ultimate	Spectrum	£5.50
▲	2 (5)	Tyrannosaurus Tower	Shepherd	Spectrum	£6.50
▲	3 (7)	Tranz AM	Ultimate	Spectrum	£5.50
▲	4 (—)	Manic Miner	Bug Byte	Spectrum	£6.00
▲	5 (12)	Flight	Psion	Spectrum	£5.95
▶	6 (6)	Terrordaktyl 4D	Melbourne	Spectrum	£5.95
▼	7 (2)	Ah Diddums	Imagine	Spectrum	£5.50
▲	8 (13)	Horace and the Spiders	Psion	Spectrum	£5.95
▶	9 (9)	Killer Gorilla	P. Power	BBC	£7.99
▼	10 (3)	Penetrator	Melbourne	Spectrum	£6.95
▲	11 (—)	Jumpin Jack	Imagine	Spectrum	£5.50
▲	12 (15)	Krazy Kong	Interceptor	Vic 20	£6.00
▼	13 (4)	Arcadia	Imagine	Spectrum	£5.50
▲	14 (—)	Mad Martha	Mikrogen	Spectrum	£6.00
▼	15 (14)	The King	Microdeal	Dragon	£8.00
▲	16 (30)	Monsters in Hell	Softek	Spectrum	£6.95
▲	17 (27)	Miner 2049er	Big Five	Atari	£29.95
▼	18 (11)	The Hobbit	Melbourne	Spectrum	£14.95
▲	19 (—)	Frogger	Microdeal	Dragon	£8.00
▲	20 (24)	Heathrow ATC	Hewson	Spectrum	£5.50
▼	21 (19)	3D Tanx	DKTronics	Spectrum	£5.50
▼	22 (10)	Psst	Ultimate	Spectrum	£5.50
▼	23 (16)	Zenon 1	IJK	Oric	£5.50
▼	24 (18)	Cookie	Ultimate	Spectrum	£5.50
▼	25 (23)	Gridrunner	Llamasoft	CBM64	£8.50
▼	26 (21)	Timegate	Quicksilva	Spectrum	£6.95
▲	27 (—)	Superspy	Shepherd	Spectrum	£6.50
▲	28 (—)	Knot in 3D	New Generation	Spectrum	£5.50
▲	29 (—)	Test Match	Computer Rentals	Spectrum	£5.50
▲	30 (—)	Scrabble	Psion	Spectrum	£5.95

PCN Charts

between August 4 and August 18.

Neither mail order nor deposit-only orders are included and the prices quoted are for the no-frills models and include VAT. Information for the top-selling micros is culled from retailers and dealers throughout the country and, like the games, will be updated every alternate week.

PCN Charts are compiled by MRIB (Computers), London, (01) 408 0250.

HARDWARE



Top Twenty up to £1,000

▶ 1 (1)	Spectrum	£99	(SI)
▶ 2 (2)	Dragon 32	£175	(DR)
▲ 3 (4)	BBC B	£399	(AC)
▼ 4 (3)	Vic 20	£150	(CO)
▲ 5 (9)	ZX81	£40	(SI)
▶ 6 (6)	Atari 800	£300	(AT)
▲ 7 (8)	Oric 1	£99	(OR)
▼ 8 (5)	Commodore 64	£299	(CO)
▼ 9 (7)	Newbrain A	£228	(GR)
▶ 10 (10)	Lynx 48	£225	(CA)
▶ 11 (11)	Atari 400	£150	(AT)
▶ 12 (12)	TI99/4A	£150	(TI)
▲ 13 (17)	Apple IIe	£969	(AP)
▲ 14 (18)	Sharp MZ80A	£549	(SH)
▼ 15 (12)	Colour Genie	£168	(LO)
▼ 16 (15)	Tandy Colour	£240	(TA)
▼ 17 (16)	Sharp PC1500	£169	(SH)
▼ 18 (17)	Epson HX20	£472	(EP)
▲ 19 (—)	CGLMS	£150	(CGL)
▼ 20 (19)	Aquarius	£99	(MA)

Top Ten over £1,000

▲ 1 (2)	IBM PC	£2,392	(IBM)
▼ 2 (1)	Sirius I	£2,525	(ACT)
▶ 3 (3)	DEC Rainbow	£2,714	(DEC)
▲ 4 (5)	Apple III	£2,780	(AP)
▲ 5 (—)	Epson QX10	£1,995	(EP)
▲ 6 (7)	HP86A	£1,541	(HP)
▼ 7 (4)	Commodore 8096	£1,374	(CO)
▼ 8 (6)	Olivetti M20	£2,754	(OL)
▲ 9 (—)	Xerox 820	£2,415	(RX)
▼ 10 (9)	Televideo TS802	£1,960	(MI)

AC—Acorn Computers. ACT—ACT AP—Apple Computer. AT—Atari International. CA—Computers. CGL—Computer Games Ltd. 60—Commodore. DEC—Digital. DR—Dragon Data. EP—Epson. GR—Grundy Business. HP—Hewlett-Packard. IBM—IBM. JU—Jupiter Cantab. LO—Lowe Electronics. MA—Mattel. MI—Mideltron. OL—Olivetti. OR—Oric. RX—Rank Xerox. SH—Sharp. SI—Sinclair. TA—Tandy. TI—Texas Instruments.

Masters of The Game



Find out why on:
01-240 1422

TESTMATCH

IN

AMAZING 3D

GRAPHICS

DIRECTFROMUS

£5.95 inc

CRL

140 WHITECHAPEL ROAD, LONDON E1.



JET PAC No 1

ULTIMATE
PLAY THE GAME,
THE GREEN,
ASHBY DE LA ZOUCHE,
LEICESTERSHIRE,
LE6 5JU.

Strengthen your hand *with Superbase* 64

The complete information control system for the Commodore 64. Ideal for any home, business or professional environment where records are kept. Create the format you

need and enter your records. If the layout or data field sizes are not quite right, correct them and carry on. Superbase gives you an unrivalled range of powerful features including:

YOUR OWN RECORDS

- Design your layout using text, numeric, calculated result, date, linking and key fields
- Record size up to 100 characters spread over up to 127 items
- Number of records limited **only by your equipment** can be thousands
- As many databases as you want - each with up to 15 files
- Learn fast through built-in HELP screens - then add your own notes

FAST ACCESS

- Keyed records for high speed retrieval - 3 secs for any file size
- Select and search for any name, description, number, date, etc. in multiple combinations
- Sort records into any order
- Display selections or generate printed reports
- Browse through records matching on any criteria

TOTAL CONTROL

- Links to other programs and EASY SCRIPT for mailshots, high-quality letters, quotes, tables, etc.
- Effective management of invoices, addresses, stock, membership, appointments - any and every kind of record for easy conversational programming, plus built-in BASIC

DATABASE MANAGEMENT

- Easy to understand menus
- Add or amend fields or alter length - no file rebuilding needed
- Update files with automatic batch processing option
- Calendar arithmetic for effective time management
- Display quantities, values, totals, as you enter them
- Formulas for on-screen result calculation



Send me details of Superbase 64 to:

Name _____
Address _____

Tel. No. _____

Precision Software Limited
Park House 4 Park Terrace
Worcester Park
Surrey KT4 7JZ England
Telephone: 01-330 7166
Telex: 8955021 PRECIS G

Precision Software

commodore

The CBM 64 explained

I am writing in reply to the letter written by P J Chadwick (*PCN* issue 21).

I would first of all like to say that learning to program with the ZX81 (although I have had no experience) must be unbelievably simple, after all it is an unbelievably simple machine. If any sophistication at all is desired then greater effort is obviously needed, but is very worthwhile.

The manual for the Commodore 64 is sparse but adequate for simple applications. If anything more is desired than the *Programmer's Reference Guide* is ideal. It could be argued that this publication should be included with the CPU.

Anyway, to try to help with a few of your problems, and by the way I am no expert, first of all the operating manual deals with the problem of multiple choice menu's quite satisfactorily (see the 'ON' statement on page 122).

The problem you have with sprites is more than adequately dealt with in the *Programmer's Reference Guide* where 50 pages are devoted to sprite graphics alone.

This number 13 stands for the 13th area in the first bank of 16K memory. Each area of memory is 64 bytes long. Therefore the 13th area of memory starts at location 832 (see page 71 of the operating manual), data is read into memory starting at location 832 and it increments the memory location by 1 each time it is read). The definition POKE 2042, 13 therefore tells the program where the data for the sprite is read for sprite 2.

The significance of area 13 is that this is the start of the cassette buffer and therefore is not needed when a program is running. Therefore you can gain an area of memory for free. However, the cassette buffer can be used only to store data for up to 3 sprites.

ie

POKE 2040, 13

S0 data read into 832 →

2041, 14

S1 data read into 896 →

2042, 15

S2 data read into 960 →

For the storage of data for more than three sprites it is suggested that memory areas 192 to 199 are used for sprites 0-7. This prevents a long Basic program from overwriting the sprite data (or vice-versa), ie



Don't carry a LOAD on your shoulders, unburden yourself on *PCN*'s letters page.

POKE 2042, 192 means that sprite 2 is to get its data from memory area 12288 to 12350 etc.

The four special function keys can be used like any of the keys by defining them in a GET statement, so they can be used to initiate any sequence. There are also toolkit programs that define these keys or allow the user to define them.

The different screen sizes of the Vic 20 and 64 totally precludes the possibility of compatibility. There are twice as many screen PRINT and POKE location on the 64 as there are on the Vic 20. This is a great improvement. Compatibility is less desirable than progress.

I would also like to point out that the manual referred to by the editor is written by Ian Sinclair.

R Rushby,

Great Sutton, South Wirral

Origin labels disabled

So J Nixon of Pinner wants to know why printers cost so much in relation to other bits of hardware? It's very simple really.

As the cost of solid state devices has fallen so fast and so far in the last few years the gap between the products which use them and those which still have a high mechanical content — such as printers, disk drives and video recorders — has widened to such an extent that the printers look expensive.

However, it is well to be careful to specify the base of

comparison when complaining about the cost of an item.

The cost of dot matrix printers with all their flexibility is very good when compared to the printers that home computer users had to put up with only a few years ago.

Mr Nixon is also much mistaken in supporting Mrs Thatcher and at the same time wanting labels on goods to show their country of origin. This is also very simple.

The present Government has presided over the de-industrialisation of Britain to the extent that we will have at the end of this year a trade deficit in manufactured goods for the first time since the industrial revolution. It has also allowed billions of pounds of investment to go overseas to equip the factories of our competitors since the abolition of exchange controls.

It is this which makes the cry for origin labels so pathetic.

I am typing this on a BBC computer of which Mr Nixon is probably proud as a British product. Inside it are chips from Japan, El Salvador, The Philippines and several other odd places — including one from Oldham!

It is impossible to say where computers or other hardware comes from just from the nationality of the company. I understand the new all British Electron is being assembled in the Far East.

Is it still a British machine, Mr Nixon?
S D Scott,
Middleton,
Manchester

Fantastic freak in manual

It's nice to see that *PCN* is giving regular coverage to the NewBrain — a normally much underrated and under-published machine. We were pleased that our 'under-a-tenner' assembler/editor, Brainzap, got a good review (*PCN* issue 20) and thought readers would be interested to know why the reviewer had difficulty with the example program.

We discovered that due to a freak occurrence in the printing process an isolated copy had been produced with two important pages half blank. Guess who got it? In the circumstances, we feel three stars for documentation is something of an achievement. It's really not been our week — the day after the review appeared Buzby did his worst and our phone was out of action for four days.

Peter Watkiss,
Watkiss Computers

Beneath the city streets...

Some time ago you published a letter (*PCN* issue 18) enquiring why the Sorcerer was missing from your Databases pages. Your reply was that since the demise of EMG it was not possible to purchase Sorcerors.

May I inform you that Computada of Holland still manufactures Sorcerors and also many add-ons and RAMpacks. In fact the Sorcerer, RAMpacks, disk drives and various other add-ons may be obtained in Britain from Colin Morle, Compusoft, 32 Watchyard Lane, Formby, Liverpool L37 3JU.

Compusoft also supplies a vast range of software for the Sorcerer. It is also the centre for the European Sorcerer Club (ESC) which is still providing a monthly magazine of tips, programs and general information for Sorcerer users. Its readership in fact is worldwide and the British members, though widespread, do meet in small groups from time to time.

EMG has been taken over by a subsidiary of one of the oil companies, which will support the Sorcerer with repairs and maintenance.

Any Sorcerer owner who has problems with repairs can also obtain alternative sources of repair and maintenance from ESC.
R Bumford,
ESC,
Bradford

Lost in a maze of bits and bytes, trapped in a forest of errors, or bugged by Basic? Whatever your problem, access our HELP function . . . better known as Max Phillips.

Write to: Max Phillips, Routine Inquiries, *Personal Computer News*, VNU, Evelyn House, 62 Oxford Street, London W1A 2HG.

Atari in the clear

Q I'm having a problem with the school's Atari. In order to complete my program, I want to use a clear command to make the right part of the screen cleared with the left side of the screen unaffected during the running of the program. Can you help?

Jim Mickelson,
Halesworth

A The range of values in the FOR . . . NEXT loops represent the area of the screen to be cleared. The routine shown in figure 1 should work in any of the Atari's graphic modes. The pound sign in this program should be keyed in as a hash in order for it to work. The routine can be accessed via a GOSUB 10000 command.

What grows from little Acorns?

Q I have a Sinclair ZX81 computer and I am thinking of upgrading to a BBC Model A computer as I can't find any more money for a Model B. But I am scared that when I buy it, the £299 price may drop due to the price wars currently being waged by other micro companies and pressure due to the launch of Acorn's new Electron.

Could you tell me if it would be wise to buy a BBC Model A or wait for developments at Acorn?

Craig Rollason,
Binley Woods, Coventry

A It is never wise to wait for developments at Acorn. Although they can justifiably be praised on many other counts, they are not known for speed.

You should decide whether you really want a Model A or an Electron. Model As are going out of production and are thus not an advisable option, and the Electron will perform much the same functions as the Model A and for two-thirds the price.

The Electron will be expandable to something approaching a fully-kitted BBC Model B — but it will cost more than

```
10000 FOR Y=0 TO 23
10010 COLOR 0
10020 FOR X=10 TO 19
10030 POSITION X,Y:Z £6; " ";
10040 NEXT X
10050 NEXT Y
10060 RETURN
```

Atari screen semi-clear.

buying a BBC micro to begin with. (For more on the Electron see last week's Pro-Test review of the machine.)

As far as a potential price in the BBC micro goes, it's not something you should be too worried about. Acorn has an agreement with the BBC that prevents it from dropping the price on the BBC to any significant degree. And given the vast number of machines they're currently selling, there is no real incentive to drop the price.

The Electron, however, is an all-Acorn affair and the company will be able to do all the price-warring it wants with its new machine — which is currently tagged at £199.

Language debate

Q Please settle an argument between a school friend and I.

What language does the Atari Video Games console use? My friend says 'Mega-Forth', but I don't believe such a language exists. Who is right?

By the way, just a quick word about the recent coupon scheme you ran for Spectrum owners. It was worth saving up for and I bought 'Frenzy', which I really recommend. Keep up the good work.

Douglas Lithgow,
Hamilton, Scotland

A I'm afraid no-one wins this argument. Although Atari VCS games machine cartridges are not programmed in Mega-Forth — but in 6502 processor machine code — they are often developed on mainframe computers that could well use a form of the Forth programming language.

The Atari VCS unit uses a downgraded 6502 processor called the 6507, which is similar enough for Atari programs to be developed in Forth language on a mainframe and then translated into 6502 machine code in

order to be implemented on the Atari. The Atari games machine doesn't have a language like Basic built into it, so the only way it can be programmed is in machine code through the processor.

Atari and some third party manufacturers have announced plans for a keyboard to upgrade the games machine to a programmable computer running Basic. Atari is releasing an upgrade called the Graduate, while a company called SpectraVideo is planning a competing version of the add-on keyboard.

They will probably sell for between £50 and £100. The keyboards should include a Basic chip and some sort of cassette interface to allow you to program the VCS in Basic (and perhaps later, even Forth).

Can 64 go into Vic 20?

I am 14-years-old and am about to buy a Vic 20. I would like to know whether Commodore 64 programs that have no POKE statements will work on a Vic 20. I have seen many 64 programs like this.

Sean Hinks,
Havant, Hants.

A If last week's Micropeadia (*Commodore 64*, Part 2, page 193, Translating from Vic to 64) didn't answer your question — here's another short answer: maybe.

If the 64 programs are written in simple Commodore Basic and don't have commands dealing with the screen or PEEKing and POKEing around in memory then you are in luck to start with.

In fact, you may be able to type them in and have them run straight off. However, you'll want things like PRINT statements, as the screen resolution on the Vic is different from that of the 64.

You'll have problems,

however, if you try to load 64 games on the Vic. The machines load and save at different speeds so you'll probably just get nothing when you try to read a 64 program on a Vic.

But Commodore has claimed disk compatibility between its machines, so you might be able to load 64 disk programs onto a Vic and modify them — but who's got a Vic disk drive?

Spectrum's amazing greys

Q Six months ago I purchased a 16K ZX81 hoping to upgrade later to a 48K Spectrum. However, I recently found out that we will not be getting a colour television as expected.

Will I be able to run colour software, and if so will it come out in lots of shades of grey or in black and white at the computer's discretion?

Would I be able to manipulate shades of grey using machine code?

And if I cannot get shading in any way, are there any peripherals to do this? If so, are they reversible?

M P Houseley,
Havant, Hants.

A The first thing we ought to establish is that the signal goes from the computer to the TV, and not vice versa. Therefore, as far as your Spectrum is concerned, you can be connected up to black and white, colour or fridge-freezer. It just produces the output, and it's up to you and your output device what you do with it.

Therefore, what you get on your black and white TV when you run colour software is jolly similar to what you get when you use said TV to watch colour TV programmes — shades of grey. This can lead to problems — try using red print on a black background, for example — but in general the shades of grey are sufficiently differentiated to allow you to see what you're doing.

You won't need machine code to manipulate colour, as the Spectrum's INK and PAPER commands will do this. The INVERSE command will give you reversals, so you shouldn't have any great problems with black and white.

THE ORIC-1 COMPANION

BY BOB MAUNDER

ISBN 0 907211 03 8 173 pages price £6.95

The Oric-1 Companion is a detailed reference guide for those Oric-1 owners who want to get to know the machine in depth. It includes a full disassembly of the Oric-1 ROM.

Section 1 — Summary of Oric-1 BASIC

Section 2 — Keywords reference guide

Section 3 — The screen display

Section 4 — Program and data organisation

Section 5 — The Oric-1 ROM

Send cheques for £6.95 (UK p&p free) to:

**LINSAC (PCN),
68 BARKER ROAD,
MIDDLESBROUGH,
TS5 5ES**

Which book would your micro want you to buy? PCN's review page helps you to choose.



'Spectacular Games for your ZX Spectrum', 'Volcanic Games for your Vic 20', 'Tantalizing Games for your T199/4A' by Hal Renko and Sam Edwards, published by Addison-Wesley at £3.95 each (paperback, 132 pages).

Three identical books — only the listings have been changed to be machine specific. The common word, you will have noticed, is 'games', and rather poor they are too.

All the old favourites are here under assumed names, Fruit Machine, a version of Simon, a few variants of Noughts and Crosses. On a brighter note, the longer listings look more work-like, with a reasonable adventure and an original game called

New York New York which gives you the task of controlling traffic in the streets of the metropolis.

It would be as well to get someone else to type in the adventure if you plan to play it, as entering the listing will give away much of the pleasure.

On the whole, these books hardly seem worth the price, and the effort of entering the listings should only be considered if you absolutely cannot afford a couple of reasonable game cassettes.

Alternatively, you could invest the money if you are in search of programming ideas, although there is no documentation of the listings in these books. **PW**

'Logo Programming' by Peter Ross, published by Addison-Wesley at £7.95 (paperback, 249 pages).

It's debatable whether or not *Logo Programming* will actually get to the audience for which it's best suited. Books about alternative micro languages tend to be seen by people who already know something about programming, but Mr Ross's book is eminently suitable for novices.

In fact, *Logo Programming*

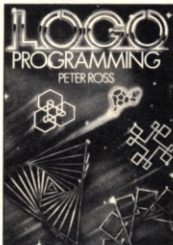
would be a good way to start programming Logo as a first language. In that sense it's useful for micro buyers in general, as well as for staff and pupils in schools.

That said, the book doesn't really achieve its stated aims. In the first chapter Mr Ross says he does not aim purely to teach people how to read and write Logo, and that his book *does* aim to help people develop the knowledge and expertise to be able to make the most of Logo as a tool.

Paradoxically, the book as completed seems to be a particularly clear and readable introduction to Logo programming, but fades out once Mr Ross talks about Logo as a tool!

The language used throughout the book is Apple Terrapin Logo, but there is an appendix dealing with Tandy Radio Shack Color Logo, and the concepts of the language are so simple that the machine-specific hurdle is easy to surmount.

My only real complaint about the book is that the typeface used is particularly gruesome. **JK**



DUCKWORTH HOME COMPUTING a new series

All books written by Pete Gerrard, former editor of *Commodore Computing International*, author of two top-selling adventure games for the Commodore 64 and a regular contributor to *Personal Computer News*, *Which Micro?* and *Software Review*.

USING THE COMMODORE 64

A complete look at the latest home computer from Commodore Business Machines. Starting with a refresher course in Basic Programming, it moves on through machine code, before considering in great detail sprites, graphics and sound. A section on peripherals, and then the heart of the book: an in-depth look at the chips that make it work, including the 6581 Sound Interface Device and the 6566 Video Controller Chip, as well as the heart of the computer, the 6502. The comprehensive appendices cover the full Basic and Machine Code Instruction sets, as well as several useful reference tables, and a complete machine code assembler/disassembler listing.

384 pages September £9.95

EXPLORING ADVENTURE GAMES ON THE COMMODORE 64

The complete guide to computer adventure games: playing, writing and solving them. Starting with an introduction to adventures, and their early history, it takes you gently through the basic programming necessary on the 64 before you can start writing your own games. Inputting of information, room mapping, movement, vocabulary, and everything required to write an adventure game are explored in full detail. Then follow a number of adventure scenarios, and finally three complete listings, written specially for the 64.

256 pages September £6.95

Other titles in the series include *The Beginner's Guide to Computers & Computing*, *Sprites & Sound on the 64*, *12 Simple Electronic Projects for the VIC*, *Will You Still Love Me When I'm 64*, *Advanced Basic & Machine Code Programming on the VIC*, *Advanced Basic & Machine Code Programming on the 64*, *Exploring Adventures on the VIC*, as well as *Pocket Handbooks for the VIC*, *64*, *Dragon*, *Spectrum* and *BBC Model B*. Write in for a descriptive leaflet.



DUCKWORTH

The Old Piano Factory 43 Gloucester Crescent London NW1 7DY
Tel: 01-485 3484

REPRINT SERVICE

If you are interested in a particular article or advertisement in *Personal Computer News*, you might like to take advantage of our special Reprint Service. Let our high quality reprints provide an attractive and impressive addition to your portfolio of promotional material.

For further details and a quotation, give us a call today.

Ring
Robert Buggs
on
01-636 6890

PERSONAL COMPUTER NEWS



MICROWAVES

Scaled a new PEEK in microcomputing? If printed your tip will earn you a fiver.

If you've got something to crow about... a bit of magic that'll make the world a better place for micro users, then send it to **PCN Readers'—our regular readers' hints and tips page.** We'll pay you £5 if we print it. We'll pay you even more if your little gem gets our vote as microwave of the month. Think on... and write to **Microwaves, PCN, 62 Oxford Street, London W1A 2HG.**

Creative cursor for the Tandy

Here are a few tips I think will be of use to TRS80 owners. From J and D Bird's Flashing Cursor program (*PCN, issue 11*), these modifications can be made after running the program:

POKE 32764, 120 turns the cursor off.

POKE 32764, 119 turns the cursor on.

POKE 32766, 240 for fast flash.

POKE 32766, 245 for normal rate flash.

To choose which character you want flashing, use POKE 32763, 159 — CHR\$ code for non-graphical characters, and POKE 32763, 159 + (192 — CHR\$ code).

If you wish to be secretive about your programs why not disable the LIST command? Use the following: POKE 16863, 195: POKE 16864, 144: POKE 16865, 0.

To re-enable the LIST, POKE 16863, 192. *Peter Welch, Wollaton, Nottingham*

Make your Lynx scroll over

One of the problems with the Lynx is the lack of scrolling. This can be a disadvantage in a text type program when you might want more than one message to appear on the screen at a time.

The following routine allows the last two or more messages to appear at the same time depending on the number you want and the size of each message.

First dimension a small array (M) with the number of dimensions being the number of messages you want to appear at

a time. The array is initialised with all elements at zero.

All messages should be in a procedure and referenced by a number.

The procedure is as follows:

5000 DEFPROC MESSAGE

5010 M(0)=M(1).

M(1)=M(2), M(2)=M

5020 CLS

5030 GOSUB 5100+M(0)*30

5040 GOSUB 5100+M(1)*30

5050 GOSUB 5100+M(2)*30

5060 ENDPROC

5100 RETURN

5110 PRINT

5120 RETURN

5130 PRINT

5140 PRINT "THIS IS

MESSAGE NO 1"

5150 RETURN

5160 PRINT

5170 PRINT "THIS IS

MESSAGE NO 2"

5180 RETURN

This can be extended as much as is required, each message taking three lines. The first (lines 5100-5120) being a blank message.

K P Walker, Hamilton, Lanarkshire

Jupiter Ace on the RUN

I was very surprised to read the letter from Ralph Lorenz (*PCN, issue 18*), who claims that by defining a word:

: AUTO SAVE RUN;

on the Jupiter Ace, you can make your programs auto-run on loading.

I have tried many times to get my programs to auto-run by using routines similar to this and not one of them has worked. It leads me to wonder whether Ralph has a later version of the ROM.

Once the program has been saved it will run, because the SAVE routine is called from within the word AUTO. However, when you reload the program, you are calling the LOAD routine from within the outer interpreter (the ROM routine which reads the keyboard and scans the input buffer, which starts at address 1266 or 04F2 hex). On successful loading a jump is made back to the outer interpreter routine at 1273 (04F9 hex) which prints 'OK' and then proceeds to scan the input buffer which, unless you typed anything after LOAD 'NAME', is empty.

The only way round this that I've found is to BSAVE the whole dictionary using 8192

```
5 REM **** DEMONSTRATION PROGRAM FOR DECIMAL PRINTING ****
10 INPUT N:GOTO 30
30 GOSUB 9000:REM **** CALL FORMATTING SUBROUTINE ****
35 PRINT "E":V$
40 END
9000 REM **** DECIMAL FORMATTING SUBROUTINE BY D.E.F. ROLFE 1993 ****
9000 Z$=STR$(X):V$="":I$=RIGHT$(Z$,3):V$=V$+Z$
9010 I$=RIGHT$(I$,1):I$=","+I$+V$+V$:"":GOTO 9040
9020 I$=RIGHT$(I$,2):I$="."+I$+V$+V$:"":GOTO 9040
9030 V$=V$+I$:"":GOTO 9040
9040 V$=RIGHT$(V$,"+V$").10) RETURN
```

Formatted CBM print — see Straight to the Point

HERE OVER — BSAVE

'NAME'. You now have the problem that the character set gets corrupted. To get around this, enter the following:
: COPY 14278 DO IC@C,
LOOP 253C,233C.;
CREATE RESTORE COPY
REDEFINE COPY

Now, assuming the word that runs your program is called RUN, edit it to read: RUN FAST RESTORE CALL etc., then type in 8192 HERE OVER — BSAVE 'NAME' RUN and your program can be reloaded using 00 BLOAD 'NAME' and it will auto-run.

The word COPY copies up the ROM routine at address 78 (4E hex) which sets up the character set on system initialisation, including all graphics characters.

Garry Knight, Larry Smith, London SE10

A sound idea for correction

Since the Lynx checks lines of Basic for errors as they are entered, it is necessary for the user to check that each line has not been rejected, before entering a new one. This considerably slows down the entry process and is tiring on the eyes.

How much nicer it would be if the computer made an audible, rather than purely visual, fuss over errors. Try this piece of machine code. Enter the monitor and type the following:
M:682 F5 3E 07 CF F1 C9 18
F8 (return).

To turn this off you can POKE 6288,&C9, and to restore it POKE 6288,&18. The code will disappear after NEW and has the disadvantage of not allowing the use of the functions USER2 and USER3 which were formerly 'NOT YET IMPLEMENTED'.

To speed up computer response and printing, type DPOKE 622F,&25B. This stops the computer from clearing every new-line. DPOKE 62FF,&3518 puts things back to normal.

Jon Chalmers, Godstone, Surrey

Straight to the point

This short subroutine in CBM Basic will provide a substitute for PRINT USING on any Commodore machine without this useful function.

The variable X is the number to be formatted, the subroutine returns a string V\$, which is the formatted number. If X is a total it is desirable to round up or down to two decimal places using the expression
X=INT(X*100+.5)/100, the maximum number of characters in V\$ is 10, including the decimal point, eg 9999999.09.

D E Rolfe, Byfleet, Surrey

Converted with a Sharp POKE

There is a very easy way of converting POKE codes to ASCII on the Sharp MZ80K. All you do is enter PRINT CHR\$ (PEEK (3270+N)) where N is the POKE code.

Before you try this, you must switch off the PEEK protect with POKE 8048,1 for disk Basic, or POKE 10167,1 for tape Basic.

A simple screen dump would be:

```
10 FORT=53248 to 54247:
PRINT/CHR$(PEEK
(3270+PEEK(T)));
20 E=E+1: IF E=40 THEN
E=0: PRINT/P
30 NEXT
Stephen Godfrey,
Hayling Island, Hants
```

CLOADing time on the Dragon

On the Dragon, the equivalent of the Basic command CLOAD in machine code is a routine called from the ROM at address 46800. When using this command the program name is immaterial.

Two other useful locations are 32789 and 32792 which, when executed, turn the cassette relay on and off respectively. *Nicholas Dyson, Irchester, Northants*

Then count the Coupons!

SPECIAL OFFER PACKAGE
commodore
VIC 20



+ C2N cassette recorder + Introduction to Basics Part I (Manual and 2 cassettes - to take you through the first steps in computing) + 1 cassette with four games + Only from Chromasonic. FREE DUST COVER normally £2.95. If purchased separately these items would cost £249.99

OUR PRICE **£149.99**

	p&p code
VIC 1525 Printer with cable	£212.75 d
VIC 1541 Disk Drive with cable	£229.00 d
16K RAM pack	£ 28.95 b
24K RAM pack	£ 47.95 b
Joystick	£ 6.90 a
4-slot motherboard	£ 33.35 c
Dust cover for VIC 20/VIC 1525	£ 2.95 a
Light pen and free game	£ 28.75 c
Super Expander (High resolution cartridge with 3K RAM)	£ 31.00 b
Programmers Aid cartridge (Adds more than 20 commands)	£ 28.00 b
Machine Code Monitor (Gives you 6502 assembly language)	£ 28.00 b
C2N cassette unit with cable	£ 39.10 c
Sargon Chess (6 levels of play)	£ 23.00 b

Many other titles in stock. Free list with first delivery.
 Or send S.A.E. for full list, state which system required.

Try before you buy.

Operate the equipment in our shop. Practice on any programme of your choice - and be sure you get what you want.

CHROMASONIC PERSONAL COMPUTERS

48 Junction Road, Archway, London N19 5RD

TEL: 01-263 9493 or 5

○ **ACCUMULATOR**
 ○ **DISCOUNT**
 ○ **COUPONS**

A Chromasonic special.

On every £5 worth of Software* you buy from us, over the counter or by mail, we'll give you a 50p **ADC**. So, with a £20 purchase, you get four **ADC's** and so on.

The same applies to Hardware, but here, we give you a 50p **ADC** on every purchase of £10, or multiples of £10. And that goes for everything in this advertisement, *except the BBC range. And virtually everything else that we sell.

On special promotion package deals, which include Hardware, the Hardware **ADC** offer applies. Collect your **ADC's** and use them as payment or part-payment for any purchase you make from us at any time upto 6 months from date of purchase. Sorry, we can't exchange your **ADC's** for cash.

Our Guarantee

1 full year for labour and parts on all Hardware.

Free Advice

on all aspects of Personal Computers. You only have to ask.

DELIVERY: On P.O.'s, Access or Barclaycard, dispatch usually within 24 hrs. Or we'll advise by return. On cheques allow about 5 days. VAT included in all prices.

If not completely satisfied, return the goods to us undamaged within 14 days for a full refund including p&p.

Plug in the TI Mini Memory Module and your Basic programming takes off, says Stephen Shaw.

TI memory jogger

The TI Mini Memory Module may be used as a file for data or programs; as a means of writing and running machine code programs; or as a means of extending the features of TI Basic. It is this last facility that we are about to look into.

When the Mini Memory Module is inserted into the cartridge slot, what difference does it make to programs in TI Basic?

Seven new commands are added, five of which are relevant to programs in TI Basic: CALL LOAD, CALL PEEK, CALL POKEV, CALL PEEKV, and CALL CHARPAT. The other two, CALL UNIT and CALL LINK, are concerned only with assembly-language programming.

CHARPAT is used to return to a string variable the current definition of a character. For example: CALL CHARPAT (65, AS) will place the string '003844447C44444' into the variable AS.

It is also possible to use the subprogram to return several definitions in one go: CALL CHARPAT (65, AS, 66, BS, 67, CS, 68, DS, 69, ES) and so on.

By being able to return a character definition in this way, it is possible for a program to return a character on the screen using CALL GCHAR and then, using CALL CHARPAT, to return the definition. The program can then modify the definition.

This can be used in a pseudo high-resolution drawing routine, where characters are continually redefined as the cursor is directed around the screen.

The other four commands are of great interest, as they permit you to look at and amend the contents of the machine's memory.

In TI Basic, the program resides in visual display processor RAM, and the Mini Memory command CALL PEEKV provides the only way to look at this area of memory.

The console has '16K of RAM' but this is not directly accessible to the CPU. The on-board RAM is controlled by the visual display processor (VDP) and the CPU has access to only two bytes at a time.

In issue 8 of PCN I gave a program to investigate the storage of programs in the Expansion Memory. Here is a program to look at programs stored in Mini Memory.

If you have a disk controller, it should be switched off before you switch the console on, as memory is otherwise used differently.

Key in the program in this order and do not edit it.

```
100 REM PCN
110 A=B+2
120 CS=DS+“E”
130 FOR I=16383 TO 16350 STEP -1
```

```
140 CALL PEEKV (I, V)
150 PRINT I; V; CHR$(V)
160 NEXT I
```

Here is the result:

MEM	VAL	MEANING
16383	0	END OF LINE
16382	32	SPACE
16381	78	N (ASCII CODE)
16380	67	C
16379	80	P
16378	32	SPACE
16377	154	code for REM
16376	7	Length of line
16375	0	END OF LINE
16374	50	2
16373	1	ABOVE NUMBER HAS ONE DIGIT
16372	200	Next byte is length of a number
16371	193	+
16370	66	B
16369	190	=
16368	65	A
16367	8	Length of line
16366	0	END OF LINE
16365	69	E
16364	1	Above string has one letter
16363	199	Next byte is length of a string
16362	184	& (concatenation)
16361	36	\$
16360	68	D
16359	190	=
16358	36	\$
16357	67	C
16356	10	Length of line

'A program can, with care, write a new program over itself'

The above represents the code for the first three lines of the program.

If you compare the above result with the similar list in PCN issue 8, it is interesting to note that TI Basic has added a space after the REM text of line 100.

Once the means has been provided to look at the program in memory, it is possible to amend the program: a program can, with care, write a completely new program over itself.

Here is an example. Type in the following program in this order:

```
100 REM PCN
110 CALL POKEV (16379, 77, 65, 71)
Before you RUN the program, LIST it.
Now RUN it and LIST it again: notice any change?
```

This is a very simple example, but the

means has been provided to carry out some very serious programming.

You will note the instruction not to edit these examples: the computer holds the program lines in the order that they are keyed in. Try the above two-line program again, but before you RUN it, edit the first line to read say PCW, and try again.

The computer can find its way about the program lines by means of a line index, which appears below the program in memory. If you are rewriting a program line using POKEV, you must either ensure the new line occupies the SAME number of bytes as the old one, or you face the task of rewriting the line index as well.

Extended Basic uses a different memory map from TI Basic. When TI Basic is selected, some of the memory used by sprites is not in use, and it is possible to POKEV values there to provide limited sprites using TI Basic.

The TI Basic interpreter does not recognise sprites, and in some instances you could cause a system lock-out. If you do, switch off and start again.

The examples given below will work without fuss.

Sprite information is divided into three areas of memory:

- Initial position
- Velocity
- How many sprites are moving?

The initial positions of the sprites are kept in an area of memory which is above the TI Basic screen map but below the TI Basic colour tables. There is enough unused memory for three sprites to be defined.

The velocity values are kept in an area used by TI Basic for the value stack, but it is possible to push the stack down by redefining characters, to leave the velocities free from stack interference.

The number of sprites moving is loaded in the small CPU RAM in the CPU.

Here is a simple example, placing one sprite on screen and moving it:

```
100 CALL CLEAR
200 CALL PEEKV (768, 98, 128, 161, 1, 208)
300 CALL POKEV (1920, 20, 20)
400 CALL LOAD (-31878, 1)
500 GOTO 500
```

Line 200 defines the initial sprite position, its colour and shape: 768 is the base address in memory, 98 and 128 are the position in pixel row and column (192 pixel rows and 255 pixel columns represent the full screen); 161 is the character. The equivalent ASCII code is arrived at by subtracting 96: hence 161 is character 'A'. The offset is always 96. The figure 1 is the sprite colour. Use the standard colour codes, but deduct 1: the 1 here is colour 2; 208 must always appear at the end of the sprite POKEV, whether one, two or three

sprites are defined.

Line 300 provides the sprite with a velocity: 1920 is the base address, and each sprite then occupies four bytes. The last two are used by the computer and can be loaded as zeros in the POKEV. The two values are row and column velocities from 0 to 255, which represent -127 to +128 in Extended Basic.

Line 400 tells the CPU that one sprite should be moved.

For more than one sprite, the equivalent lines would be:

```
200 CALL POKEV (768,98,128,161,1,
88,128,162,2,95,156,163,3,208)
and
300 CALL POKEV (1930,50,50,0,0,
130,2,0,0,5,140)
and
400 CALL LOAD (-31878,3)
```

Here are some sample programs to try:

```
100 CALL CLEAR
110 MEM=768
120 FOR X=0 TO 3
130 CALL POKEV (MEM+X*4,20+
X*3,140-X*9,161+X,X)
140 NEXT X
150 CALL POKEV (780,208)
160 GOTO 160
```

```
100 CALL CLEAR
110 FOR T=1 TO 150
120 CALL POKEV (768,30+T,40+T/
2,161+T/2,(T/10)+1,208)
130 NEXT T
```

If you wish to use moving sprites in a TI Basic program, first define the following characters:

```
100 FOR T=96 TO 159
110 CALL CHAR (T, "O")
120 NEXT T
```

Characters up to 140 or so can be subsequently redefined without halting your sprites. The other null definitions serve to keep the variable stack from growing so that it overwrites the data, thus halting your sprites or crashing your program.

The screen resides in VDP RAM 0 to 767, but using POKEV is no faster than using CALL HCHAR.

The Colour Table follows the screen, and TI says it starts at 768. In fact it starts at 783, which is why we can use those sprites.

One byte is used to define the foreground and background colour of each character set. VDP RAM location 783 is where the cursor and edge character colours are defined. We can therefore change the cursor colour by POKEVing here.

Turn each colour value into a 4-bit binary number, after subtracting 1 from the usual value, eg:

BLACK = normal code 2 = BINARY of 1 which is \$01

WHITE = normal code 16 = BINARY of 15 which is \$0F

To define the cursor as black on white, we place the black binary number before the white binary number: \$1F. Now this 8-bit binary number is converted to decimal: \$1F = digital 31.

So: CALL POKEV (783,31) will change the cursor colour.

TI says the Character Tables run from VDP RAM 1024 to 1535. As each

character occupies eight bytes, this covers only characters 32 to 96.

What of the rest?

It seems the smaller characters are normally derived from the large ones by the removal of two bytes of information, thus allowing an extra set of characters with no loss of memory. However, when it is necessary to define the small characters and ASCII codes above them, the definitions are placed above VDP RAM 1536. Then follows value stack, string space, symbol tables, line index and finally your program.

The cursor is also defined in VDP in RAM in eight bytes from 1008, while the edge character (31) is from 1016. The normal character definition is in 16 hexadecimal characters.

VDP stores the definition as the digital equivalent of eight binary numbers. Each row of pixels is defined in one byte. In an 8-digit binary number, each number has a specific digital value:

128 . . 64 . . 32 . . 16 . . 8 . . 4 . . 2 . . 1

Each on pixel in the line is summed with the others, giving a full line total of 255 if all the dots are on.

If the left-most pixel only is on, the value placed in VDP RAM is 128, and so on. Thus a box cursor can be defined as:

```
CALL POKEV (1008,255,129,129,129,
129,129,129,255)
```

To revert to normal cursor and definition, use QUIT or switch off. Or redefine!

As you can see, the Mini Memory Module can be used to make your TI Basic programs much more interesting.



In the first of three parts, John Noad puts you on the trail of creating your own adventure.

Micro in wonderland

The time can be past, present or future, and the place can be anywhere from Ancient Rome to a far distant planet a thousand years from now.

One of the greatest advantages that Adventure games bestow upon their players is the gift of freedom. The freedom to be anyone you want to be, at any time in history, in any place between here and the edge of the universe. The only limits to a computer adventure game are those set by the ingenuity of the writer/programmer. So, if you've ever thought of creating your own adventure but weren't quite sure where to start, PCN can help.

In the next few weeks we'll be looking at some of the most important features involved in creating any adventure. So let's get down to business.

The plot

Just like any other story, an adventure has to have a plot. It has to have a beginning, set out by the writer, a middle, which depends equally upon the writer and the choices made by the player, and an end, where the player receives a just reward for having avoided all the traps and solved all the problems set by the writer.

Sounds complicated? Well please don't be put off. If professional writers are to be believed they often start out with only a few rough ideas about where their story will start and where it'll end. The rest gets made up as they go along.

All you really need to begin with is a starting point, a rough description of the setting and purpose of the adventure, and some idea of how it ought to finish.

The map

Once you have a basic idea of what your adventure is to be about the next important step is to make a map of the area within which the adventure will take place. But before you start to draw the map there are a few things you'll need to take into account:

■ **Storage space.** If an entire adventure program (in Basic) with 100 rooms, a description for each room of 220 characters (average), and an array of movement codes, is loaded into a computer it will take up approximately 40K of RAM. Anyone using cassette storage and a 48K system should take this as a rough guide to the maximum size of their maps ie 100 locations/rooms.

However, if you are using a disk storage system then you can aim considerably higher. Although it will mean a pause of about five seconds for each move, a disk referencing adventure may contain as many as 1,000 rooms for each 100K of disk storage available. To get the maximum use from your disks put the master program on one disk and the room descriptions and movement codes on another.



Kieren Phelps

■ Will the adventure be linear or multi-choice? Roughly speaking the difference between these two alternatives is this. A linear adventure has only one correct route to the final goal and only one correct solution to each problem. Thus the map can be quite small with only a few detours and dead ends included because the main point is to solve the problems.

In a multi-choice game the complexity of the map is often as important as the problem solving. There may be more than one solution to each problem — you could kill a dragon with a sword, found in one room, a gun, found in another room, or simply drop a bananaskin for it to slip up on while you escape. So, generally speaking, linear games can be based on quite small maps, while in a multi-choice game the bigger the map the better.

■ Will it be a text adventure or text and graphics? The problems involved in writing a text and graphics adventure, as against text only, are twofold. In the first place the graphics should positively add to the player's enjoyment of the game so they need to be of a fairly high standard. Secondly, and most important in this context, the graphics screens on many micros are part of the user RAM. So using graphics may well mean losing storage

space. In the case of disk referencing games this only means that the master program may be affected. And not many game programs need that big a chunk of RAM anyway. For a cassette-based game the use of graphics may drastically reduce the size of map you can use, unless you can compensate by writing the program in machine code.

With these three thoughts in mind we can actually begin to lay out a map. For this you'll need several sheets of paper, a pencil, eraser and at least two or three felt tip pens in different colours. For simple maps the paper can be divided up into fairly large squares, to hold a room number and name. This allows movement North, South, East, West, Up or Down. For more complicated maps the paper should be divided up into octagons (see illustration), to allow movement North, Northeast, East, Southeast, etc.

Since it's very unlikely that you'll be able to draw up a map to your complete satisfaction at the first try don't worry too much about where to put the starting location. The centre of the page is as good a position as any. Now number and label that location. Start numbering from 1, not from 0 — you'll see why when we get to the movement codes.

THE AUTUMN COMPUTER TRADE FORUM

4th-7th October 1983

National Exhibition Centre, Birmingham

Sound business sense for volume buyers

The Autumn Computer Trade Forum is the UK's largest and most successful trade event and the only show that fully understands the needs of volume buyers.

It offers you a comprehensive display of minis, micros, software and peripherals in an environment that's specially made for volume business.

Who is CTF for?

Distributors. Dealers. Software houses. Systems integrators. Retailers. OEM's. In fact anyone who makes a living buying and selling computers, software and peripherals. So whether you're new to DP/WP or know the business backwards, CTF is the event you mustn't miss.

How can CTF help you sell more?

The exhibitors at the Computer Trade Forum understand your needs. That means they'll be talking your language. Quantity terms. Discounts. Marketing support programmes. Delivery schedules. The whole range of services to help you sell more.

Who will be at CTF?

Texas Instruments. Logica. DEC. Systime. DRG. Zygol. Motorola...and many more! And for every name you know there'll be many you don't—with products that could well be your next year's big seller.

Why CTF is different!

The Computer Trade Forum is the only show that understands what volume buying really means. The atmosphere, the choice of exhibitors, the absence of

razmatazz are all designed for profitable business.

CTF has been specifically designed for you and as a proven, established national event it offers you even more with the support of leading UK suppliers.

Post the coupon today

The general public is not invited to CTF. The emphasis is on volume business. And for you it's free! Just fill in the coupon and we'll send you free tickets (worth £3.00 each) by return of post.

If you need to know more, call 01-747 3131.





Computer Trade Forum
232 Acton Lane, London W4 5DL

Please send me.....free tickets for myself
and colleagues.

Name.....

Position.....

Company.....

Address.....

PCN/1

☐ I am interested in
exhibiting at CTF
(No one under 18 admitted)



Breakthrough!!

NEW STOP PRESS NEW Colour Genie Owners

World Exclusive!!

Available
from stock
NOW!

Now you can connect **Disc Drives** to your Colour Genie with
the WIZARD interface for **£99 only** – the WIZARD interface

Available
from stock
NOW!

QDOS

QDOS is the disc operating system for the
Colour Genie with Wizard interface.
QDOS facilities include:

Auto, Basic, Clock, Copy, Date, Dir, Dump,
Format, Free, Kill, Lib, List, Load, Print, Re-
name, Time, Trace.

QDOS is also specifically designed to Read
and Write files set up by most disc operating
systems for the Video Genie and TRS-80 Model
I computers. You can therefore transfer your
files and maintain compatibility.

QDOS £35

* SPECIAL INTRODUCTORY OFFER *

Buy the Wizard interface and a disc drive
from us and get QDOS FREE.

For example:

Wizard	£99
Canon 110 Drive	169
Ribbon cable	19

TOTAL £287

with FREE QDOS

CANON slim Disc Drives

110 40 track single sided	£169
210 40 track double sided	£209
220 80 track double sided	£269
Ribbon cable	£19
Colour Genie 32K	£146

THE WIZARD

The Wizard is an interface which con-
nects direct to the cartridge port on the
Colour Genie keyboard. The Wizard com-
prises a disc controller, with 25ms inter-
rupt driven heartbeat output to provide a
real time clock. Centronics parallel inter-
face and power supply, enclosed in a
sleek, sturdy, steel case. It even has a
mains plug with the correct fuse already
attached.

The Wizard was designed and is manu-
factured by us in our own factory. The
design utilises the experience we have
gained over the last two years in design-
ing and manufacturing a similar interface
for the Video Genie and TRS 80 Model I
computers.

Further disc drives can be added using
a standard daisy chain cable.



All prices exclusive of VAT and Carriage

GENERAL NORTHERN MICROCOMPUTERS LTD.

Dept. WM1083, 8 Whitworth Road, South West Industrial Estate,
Peterlee, Co. Durham, SR8 2JJ.

Telephone: Peterlee (0783) 860314 (24 hour Answering Service)

Credit
Facilities
Available

YOUR HOME COMPUTER SPECIALISTS

ATARI 400 + 800



400 + Basic + Recorder
+ Joystick + 5 blank
cass. + demo cass.

£185.00

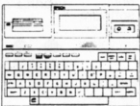
400 as above but with
48K

£264.00

800 as above with 48K

£339.00

EPSON HX20



HX-20

£462.00

QX-10

£1995.00

SHARP

MZ80A

£399.00

MZ80B

£799.00

PC1500

£155.00

PC1251

£79.95

Dragon 32

£169.00

Spectrum

from £99.00

Oric 1 (48K)

£139.00

Aquarius

£79.95

VIC20 Pack

£139.00

CBM64

£199.00

Sord M5

£149.00

TV GAMES

Atari + Intellivision

Soon — Coleco + Vectrex

All prices inc VAT.

24 GLOUCESTER ROAD BRIGHTON 698424

From now on the direction that you plot for each move will depend on what is happening in the adventure. Take another look at the illustration. You'll see that I've numbered a whole block of locations (the squares don't count as rooms). This allows for a range of different movements.

Let's suppose that a large obstacle is occupying rooms 5, 8, 9 and 12. In this case I would leave that area un-numbered and the only legal movement away from the start would be 2, 4, 7, 11, etc. or 3, 6, 10, 13.

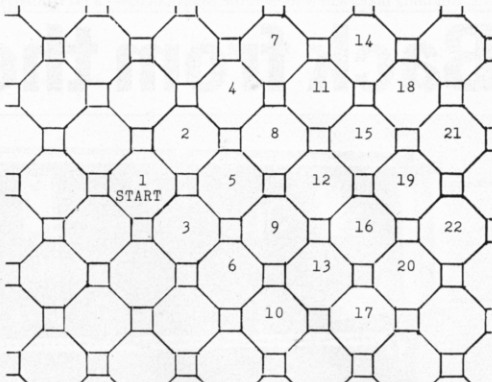
In another situation I might want to use that same area as a swamp or a minefield. In that case all the rooms would be numbered but the player would be sucked down or blown up if he entered rooms 8 and 9, say.

Alternatively, if room 1 was situated in a forest or cave then legal moves might follow a series of twists and turns — 1, 2, 5, 8, 11, 15, etc. While if I were on a city street or travelling in outer space most moves would follow a straight line — 1, 5, 12, 19 ... It's your game. As long as you give the player a fair chance you can lay out rooms and paths however you like.

Creating characters

One of the great unsettled questions discussed among computer adventurers is: Should a player's fantasy character be dictated by the player, or by the computer?

In practical terms this means the difference between giving the player a number of character points to distribute as



he wishes within a fixed minimum and maximum, or having the computer do the same job — usually in a fairly arbitrary manner with the aid of a random number generator.

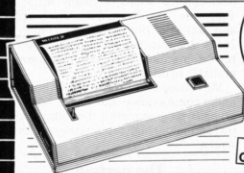
Next week there'll be more about maps and characters, plus a description of how to plan movements and set up movement codes.

A starship lost in space, an ancient dungeon, a dense forest — wherever you place your adventure it all starts with a map. Having chosen your starting point, lay down the trail for the adventurer, setting traps and discoveries as you go. You can either use lined grid paper, or draw up octagonal grids for more complicated scenarios.

COMPUTER ACCESSORY BARGAINS

from HENRY'S

SAVE
£57



LIMITED QUANTITY

FULLY GUARANTEED

THERMAL MATRIX & LINE PRINTER

150 x 180 LPM • Full 96 CH ASC II • 40 CPL • 280 Data P/L • Auto-underline • 50 Graphic Symbols • Back Space Self Test • VU/HOR TABS • 7 x 10 Matrix • 4.6" Wide Paper • Bidirectional • 220/240 V AC • Size Approx. 9.8 x 2.8 x 7.2"

SUITABLE FOR TANDY • BSC • DEC • NASCOM GEMINI • ACORN • NEWRAIN • DRAGON Etc. (Your enquiries invited)
(Interface unit with leads £15 - State model)
Also for Apple II, Spectrum (With suitable interface - not stocked by us)
Computer stockists of MULTIBOARDS, GEMINI, NASCOM, ALSO MONITORS, KEYBOARDS, PAPER SUPPLIES, ACCESSORIES, Etc. Etc.

COMPLETE WITH FULL HANDBOOK, 3 ROLLS PAPER

£129.95

£113.00 - VAT INC. VAT

(UK C/P £1.05) (List approx £197 with paper)
Quantity prices on request

Open 6 days a week.

Well worth a visit

Henry's Computer Shop

404/406 Edgware Road, London, W2 1ED Tel: 01-402 6822
ORDER BY PHONE OR CALL IN AND SEE FOR YOURSELF

Order by Post with CHEQUE/ ACCESS VISA or you can telephone your order. All orders despatched within 1 day unless advised.

Byteland

SUPER ORIC 48K OFFERS

BAR BLASTER

Select the correct power and unleash the radioactive ball to wipe out the multi-coloured bars. Too much power and the ball will just bounce back. Achieve optimum score and you move onto the next level. **£4.95**

You are trapped in the 'Memory Map' (a three dimensional maze). Your job is to find your way out. Keep your moves low, it improves your score.

MEMORY MAP

£4.95

ROUTE RIDER

£4.95

Guide your ship, avoiding the obstacles and make sure you don't cross your own trail. Look out though as you journey on, the room to manoeuvre reduces. 5 skill levels.

Save £1 when you buy the set for **£13.85**

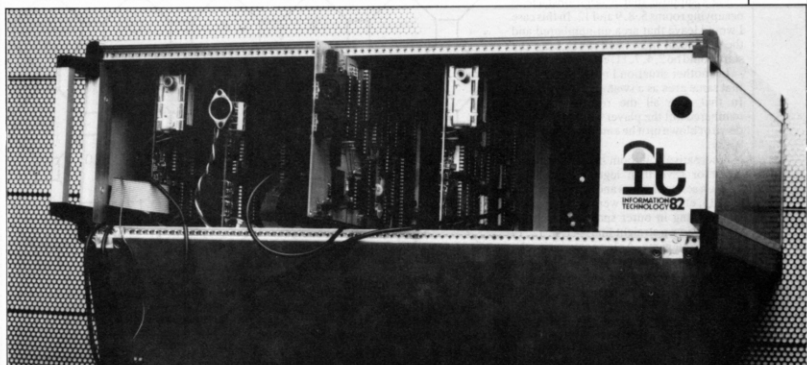
POST FREE

Send a cheque or Postal Order to:

BYTELAND - PO Box 57 Sawbridgeworth, Herts CM21 9EG.

G E Chkiantz takes a new look at the Microtan 65 — a DIY micro that narrowly escaped extinction

Back from the brink



Open the case: the heart of the system is a 12-slot motherboard with a 64-way Eurocard connector. You add the cards you need.

In the beginning (circa 1981) the Microtan 65 computer system was brought to fruition by Tangerine Computers as a single-board, 6502-based kit. Its main attraction was the facility to build it up to a complete computer system.

About 10,000 systems were sold, despite little exposure, when Tangerine decided to disinherit its child. However, Tangerine dealers Microtan Computer Systems acquired all rights to the system and is now relaunching the machine.

Presentation

The Microtan 65 is principally popular in kit form (see page 30), allowing you to expand in the manner that best suits your requirements and your bank balance.

Any of the boards can be supplied ready-built and some, like the disk controller, can only be bought this way because of their complexity.

The whole system is housed in a smart 19in frame with a very neat switched power supply. A high-quality ASCII keyboard with numeric keypad is also available.

Documentation

There are separate manuals for all the individual components in the system. All are of good quality. The documentation for the main board is typical: it includes adequate constructional notes and does not attempt to hide information.

Because the board may be used in stand-alone form for machine coding, details of the 6502 opcodes are thoughtfully provided, as well as a few games listings.

Most notably, a complete annotated listing of the monitor ROM is also provided with details of how to use the

more useful subroutines, including the registers and locations that are used or that may become corrupted.

Documentation for the Microtan's Basic is average but does have very useful extra sections detailing the use of logical operators, space and time optimisation of programs, the USR(X) functions and a list of formulae to derive mathematical functions not intrinsic to Basic.

Keyboard

Two options are available for use with the system: a keypad and a full ASCII keyboard. Both plug into the same socket on the Microtan 65 board and can be used in the most minimal to the most complex systems as the system firmware configures itself automatically to the device in use.

The keyboard is a 73-key, full travel, typewriter pitch type with separate caps and shift lock. The latter features a warning LED and acts exactly as does its counterpart on a typewriter while the caps lock forces letters only into upper case.

This is well thought out and provides options which should suit most users. Auto-repeat is unfortunately omitted, although there is a repeat key.

The keyboard may be housed in a heavy black metal case which is certainly strong if rather stark and angular-looking.

Display

A variety of options exist for video output of which the most primitive is a 32 column by 16 row, upper case only display of outstanding stability. This circuitry is contained on the Microtan 65 board. Further choices on the main board include lower case and a limited graphics facility

giving a resolution of 64 × 64.

In an expanded system further options include a 64 × 25 colour board with teletext-style characters, lower case, block graphics and inverse or flashing output. This board has both monochrome and RGB outputs but there is an optional PAL encoder and UHF modulator to produce composite video.

For high resolution graphics, a monochrome board originally made by Tangerine is on offer and a colour board is also available. Both offer a resolution of 256 × 256. Neither was supplied on the review machine but extra software is available to drive them.

Microtan says an 80-column board is under consideration and a final bonus to graphics programmers is the ability to mix text and colour high resolution graphics on screen.

The system

The Microtan 65 is basically a 12-slot motherboard with a 64-way Eurocard connector carrying the bus information. Three of the slots are dedicated to particular boards, namely the Microtan 65 board, the Tanex 7K RAM card, and the TANDOS disk controller board.

These slots are all clearly marked and have the connectors offset to avoid errors. A smaller two-slot expansion board is also available to house the Microtan and Tanex to form a discretely powerful package.

The complete system bus has extensive paging facilities controlled by software switches which are sensibly located in the system ROM area and allow up to 256K of memory to be accessed at the flick of a switch.



The Microtan 65 board itself houses the 6502, 1K of RAM, 1K of ROM, the keyboard interface and the video circuits. The Tanex board is its closest companion, providing full address decoding and data bus buffering that could not be fitted on the Microtan.

The memory map of the system is allocated by this board as 47K of RAM, 1K

of I/O, and reserved areas for languages in ROM and system firmware.

It also provides a considerable extension to the system as the board can hold up to 7K of extra RAM, 14K of EPROM, and two 6522 Versatile Interface Adaptors giving 32 I/O lines. Some of the I/O lines are used to provide the cassette and RS232 interfaces, others provide a Centronics printer

port but they may also be used for other purposes.

Expansion

The TANRAM board forms the main memory expansion for the system with 7K of static RAM and 32K of dynamic RAM using 4116 chips. This boosts the system to its full complement of 47K of RAM. The

ORIC-1



The Growing System

ORIC 3" MICRO FLOPPY DISK DRIVE

Coming soon the incredible new 3" Micro Drives. Small size, Compact, High precision disks with storage capabilities from 100K Bytes to in excess of 1 Megabyte unformatted. With their own built-in power supply, these easy to use units will add big system capability to your home micro.



ORIC MCP 40 COLOUR PRINTER/PLOTTER

The Oric Colour Printer is quality engineered to provide 4 colour hard copy on plain paper, with superb graphics and text capability, printing either 40 columns or 80 columns. It prints in red, green, black and blue, onto a 4 1/2" width standard paper roll. With a print speed of 12 characters a second, the

MCP 40 comes with its own power supply and all necessary leads to connect straight into your Oric or to any standard Centronics interface.



This superb printer represents excellent value at just **£169.95 including VAT.**



The right choice for real computing ORIC-1

Before making your final choice, check any other home micro in the same price bracket, against the incredible specification of the ORIC-1.

● Quality of build and materials	● Real computer keyboard layout and moving keys
● Superb styling / Full colour display	● High Resolution colour graphics 240 x 200 pixels
● Choice of 16K or 48K RAM	● Real computer language programming – Basic / Forth
● Latest design technology and circuitry	● Teletext/Viewdata compatible graphics (28 rows x 40 characters)
● Real sound – 8 octaves plus Hi-Fi output	● Cassette Port & R.G.B. output.
● Centronics printer interface	● Fully supported and growing software library
● Colour printer / Disk Drives	● A fully expandable system for home, education & small business use
● Communications Modem	● Full range of peripherals to support your system...

ORIC-1 Setting today's standard in Quality and Price.

ORIC-1 48K £139.95 inc.VAT ORIC-1 16K £99.95 inc.VAT

All ORIC computers purchased before 31st December 1983 come with a £40 voucher off the M.R.P. of the MCP 40 Colour Printer. **MCP 40 COLOUR PRINTER £169.95. OFFER PRICE £129.95**

TANSOFT ORIC Software

The fast growing success of ORIC-1 means that an incredible number of software titles are becoming available for your Oric. With many well known titles from independent software houses, plus exclusive ORIC SOFTWARE from TANSOFT, you can now drive your Oric towards its full potential. Below is a small selection from Tansoft's range, all of which offer superb value.

BUSINESS

ORIC BASE, ORIC CALC, AUTHOR.

MACHINE LANGUAGES

FORTH, ORIC MON.

COMPUTER GAMES

ZODIAC, HOUSE OF DEATH, ORIC MUNCH, SUPER BREAKOUT, ULTIMA ZONE, DEFENCE FORCE.

TANSOFT ORIC SOFTWARE available from your ORIC supplier and all good software dealers. For full list of further information contact:-

TOURING LANGUAGES

GERMAN, SPANISH, ITALIAN, FRENCH.

GENERAL INTEREST

ORIC CHESS, MULTIGAMES 1, MULTIGAMES 2, ORIC CAD, THE NOWOTNIK PUZZLE.

**NEWS FLASH
LATEST RELEASE
THE HOBBIT**



427 use of dynamic RAM keeps the chip count and power requirement to a minimum but limits the top speed to 1MHz.

An EPROM switching board is a useful addition, especially for those using cassette-based mass storage. The ROM area is decoded into two 4K and two 2K blocks which means the 10K Basic, 8K Forth, 8K word processor and two pass assembler plus several toolkits are instantly accessible.

An EPROM programmer allows you to program all common 2K and 4K devices. The EPROM is powered only during command operations so removal is safe. Software is provided to check, copy from EPROM to memory, program either the whole device or single step, and verify.

Basic

A 10K Microsoft Basic is available for the machine with all the usual features. It lacks the advanced commands now becoming increasingly common but does feature full error messages.

A screen-orientated editor is provided which is set up for the original 32-column screen. If the 64 x 32 card is in use a copy of the original screen is placed in the centre of the new one. Dotted lines highlight the line to be edited and a nice feature is that, depending on which terminator is used on the line, either the next or the previous line may be brought into the edit buffer.

For the machine code programmer, the Microtan comes with a built-in monitor. It is very neat and competent and features the usual facilities with some extras. You can single and multiple step through a program, and set up to eight breakpoints.

It can be further augmented by XBUG which includes a disassembler and single line assembler plus extended printer support and some useful memory management routines.

Additional high level languages are available including Pilot, an implementation of FIG-Forth and a full-blown two-pass assembler. All can reside in EPROM, leaving the RAM area free for programs.

Verdict

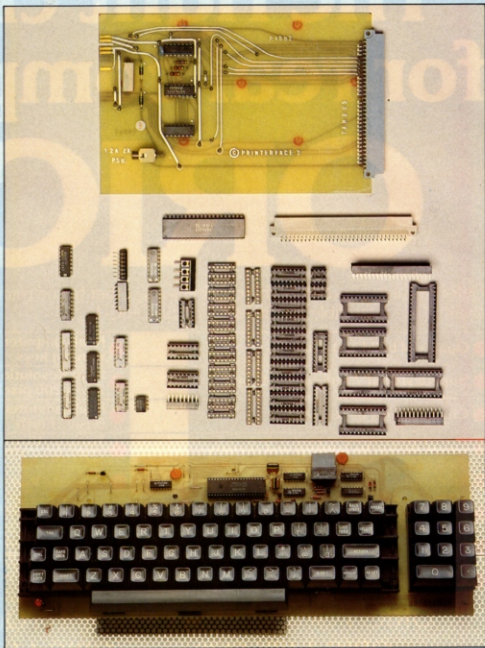
The Microtan system will appeal to enthusiasts who do not want a little box full of mysteries, but would like to get intimately acquainted with their machine.

The 65 is capable of expansion in almost endless variations.

There are some problems: the 65's processor clock speed of 0.75MHz scarcely does justice to the 6502 which may now be driven up to four times as fast. I also feel that the price is rather high.

When comparing the system with others available you should remember that it is not a rival to the Oric and Sinclair machines. It is aimed more at the BBC and Apple markets with the advantage that it is extremely flexible, leaves you with more RAM than the BBC and you do not have to buy everything at once.

The system is a taut and intelligent design. With the quality of documentation and backup, it is easy to understand users' almost fanatical loyalty to the machine.



Soldering on . . .

Microtan in the making — David Guest is the only man for the job.

There's nothing quite like a distinctive aroma for bringing out the poet in people. With some it's damp leaves or freshly-mown grass, with others home-cooking or a subtle perfume.

With veterans of the computer business it's solder. As Martin Duvall might have said in *Apocalypse Now*, there's nothing like the smell of solder at breakfast. (In fact he was talking about napalm but solder can have a similar if less dramatic effect on a carelessly positioned African violet.)

Micros that require you to take up a soldering iron are few and far between these days, so Microtan might find itself fuelling a nostalgia boom with its Microtan kit.

A new generation of enthusiasts could discover the delights of microcomputer construction, and old-timers could treat themselves to a sentimental journey, the more so since the Microtan 65 is none other

than the old Tangerine micro under new ownership.

I, from the PCN team of experts, was hand-picked to build this device because I'd never wielded a soldering iron in my life. I should therefore declare a prejudice — I'd never touched a soldering iron because I'd never wanted to. I'd long suspected that ready-made systems were unreservedly a great boon to mankind and that soldering had not merely gone out of fashion, it had been superseded as a tedious and unreliable operation.

Any such newcomer to the technique requires guidance, and Microtan's documentation helpfully suggests that you read the manual before attempting anything. The manual covers almost everything from the rudiments of binary arithmetic to the intricacies of the discouragingly named Tanbug operating system. Its punctuation is idiosyncratic, with commas flung across

DISKPOST

* BETTER VALUE MAIL ORDER SUPPLIES FOR YOUR MICRO *

VEREX DISKS



Manufactured by Verbatim, to accepted industry standards. Full one year warranty. Quality products at popular prices for both home and office use.

5.25" DISKETTES

MD200-01	S/S, S/D, 48 TPI	£1.71
MD200-AS	S/S, S/D, 48 TPI	£1.66
Apple systems only		

8" DISKETTES

FD34-1500	S/S, S/D	£1.85
DD34-1501	S/S, D/D	£2.82

32 hard sector available at same price.

DATALIFE DISKS



From Verbatim, the world's leading diskette manufacturer. Full 5 year warranty. All mindisks are certified for double density recording, and are fitted with hub ring reinforcement as standard.

5.25" DISKETTES

MD525	S/S, D/D, 48 TPI	£1.92
MD550	D/D, D/D, 48 TPI	£2.86
MD577	S/S, D/D, 96 TPI	£2.69
MD557	D/S, D/D, 96 TPI	£3.60

48 TPI suitable for 35 or 40 track operation. 96 TPI suitable for 77 or 80 track operation. 10 and 16 hard sector versions available at same prices.

8" DISKETTES

FD34-9000	S/S, S/D	£2.75
FD34-9000	S/S, D/D	£2.80
DD34-4001	D/S, D/D	£3.26

32 hard sector versions available at same prices.

XIDEX DISKS



The new premier quality standard, against which all other manufacturers will have to be judged. All products certified for double density recording. Now with a lifetime warranty. Unreservedly recommended.

5.25" DISKETTES

5012-1000	S/S, D/D, 48 TPI	£2.06
5022-1000	D/S, D/D, 48 TPI	£2.90
5012-2000	S/S, D/D, 96 TPI	£2.92
5022-2000	D/S, D/D, 96 TPI	£3.77

48 TPI suitable for 35 or 40 track operation. 96 TPI suitable for 77 or 80 track operation. 10 and 16 hard sector versions available at same prices.

8" DISKETTES

8012-1000	S/S, S/D	£2.78
8022-1000	S/S, D/D	£3.36

32 hard sector versions available at same prices.

THE LAST ONE



Got a computing problem? Produce your own solution by using The Last One, a program generator which has helped to solve hundreds of problems in installations throughout the world. TLO runs on the Apple II and Ite, Commodore 4032 and 8032/96, TRS-80 Model II (TRS-DOS or CP/M), most CP/M, CP/M86 and MS-DOS machines including the IBM PC (PC-DOS) and Sinus.

Try out TLO for £50.

A limited demonstration version of TLO is now available for only £50, including full documentation. This cost is fully refundable against your subsequent purchase of a full version.

Full version costs—		
for Apple II	—	£185
all other versions	—	£350

Please specify version requirements when ordering.

DISK DRIVE HEAD CLEANING KITS



Helps to protect your valuable data, and minimise expensive downtime and repair costs. Consists of a flexible jacket, which receives a pre-saturated cleaning disk. Each disk is sealed within a foil sachet to ensure that it contains the right quantity of cleaning fluid when used. After use the disk is disposed of, and the jacket is kept for future use.

Suitable for single or dual head drives. Please specify 8" or 5.25" disks.

STARTER KIT	£8.12
(contains jacket and two cleaning disks)	

REPLACEMENT CLEANING DISKS	£15.54
(pack of 10)	

DISKETTE STORAGE BOXES



Protect your diskettes and valuable data from external contamination. Lockable, portable and secure. Two part box made from anti-static ABS plastic. Price includes dividers and index labels. Capacity 80 disks.

A5 Storage box (for 8" disks)	£33.60
A6 Storage box (for 5.25" disks)	£23.10

CTI - CP80 PRINTER



Features—

Friction and tractor feed as standard.
80 c.p.s.
8-directional logic seeking.
13 x 9 dot matrix giving true descenders.
Sub and superscripts.
Basic printing and auto underlining.
Condensed, emphasised, expanded and double strike printing (can be mixed in a line).
Parallel interface fitted as standard.
12 month warranty.

Print sample available on request.

CP 80 PRINTER	£289.00
Optional RS-232 interface	£40.00
Special VIC20/VIC 64 interface	£46.00

PRINTER STAND



Suitable for use with dot matrix printers. Lifts printer sufficiently to enable continuous stationery to self-stack. Painted steel unit. Dimensions: 38cm wide x 28cm deep x 10cm high

Comes as package which also contains—

200 sheets continuous stationery.
1 x 9" binder.
1 x highlighter pen.
choice of rubber feet/sticky pads.

PRINTER STAND	£21.95
---------------	--------

COMPUTER FURNITURE



Suitable for use with all leading personal computers. Features a top shelf for monitor/printer, lower shelf for books, paper and general storage, large desk top surface at keyboard height, attractive teak finish, and castors for mobility.

U.K. Manufacture. Comes in flat pack for self assembly - full instructions provided. A further range of more sophisticated units is available - please ask for details.

THE ORGANISER	£55.00
---------------	--------

To: DISKPOST, FREEPOST, WEST MOLESEY, SURREY, KT8 0QF. Tel: 01-941 4066

All prices inclusive of delivery and insurance on British mainland.

Qty	Product	Price
£		
£		
£		
£		
PCN	Sub Total	£
	Delivery/Insurance	£ FREE
	V.A.T.	£
TOTAL VALUE OF CHEQUE PAYABLE TO DISKPOST		
£		

Company Orders

If you are unable to raise cheques without an invoice, please post or telephone your order to us. We will then forward a pro-forma invoice, for your accounts department to pay against.

YOUR NAME.....
ADDRESS.....
.....
.....
.....

Tel. No.:.....

Please charge to my Visa/Mastercharge/American Express/Diners Club account.

My card number is.....



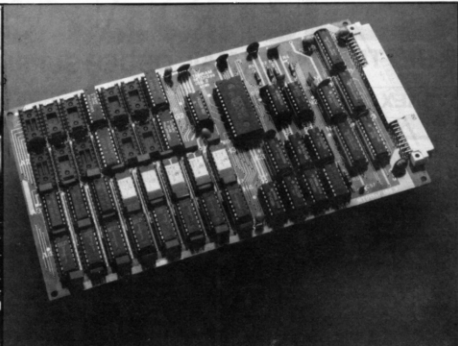
Credit Card Orders

We welcome Visa, (Barclaycard), Mastercharge, (Access), Diners Club and American Express. There is no credit card surcharge. Either write your card number on your order, or telephone your order to our sales office.

DISKPOST® is the mail order division of the BFI Electronics Group Europe's largest independent diskette supplier.

DISKPOST

FREEPOST West Molesey
Surrey KT8 0QF. Tel: 01-941-4066



First expansion: the TANRAM board offers 40K RAM with both static and dynamic chips.

the pages, and the writer's sense of prepositions betrays an Iberian origin, but by and large it doesn't read badly.

It is in the Aids to Construction that the manual falls down and this, of course, is where you need it most. The components are listed and the PCB is clearly marked, but not all the devices supplied correspond to those listed (is a 21L14 chip functionally the same as a 2114?), nor do the marks on the board tell the whole story.

When you've washed your hands, earthed a piece of aluminium foil and prepared your artificial aids, you should be confident enough to begin. Almost immediately you'll find a problem—the first items to solder to the board are the sockets in which the chips will sit, and you have to put them in the right way round.

The manual advises you to make sure that the Pin 1 identifier is at the appropriate end, but the sockets lack a Pin 1 identifier. This isn't an insuperable problem—you can just get stuck in, be consistent, and hope you guessed right. But doubt will grow in your mind and by the time you have to check the polarity of the diodes (again without help from the manual) you may have begun to wonder whether you weren't presumptuous in breaching the sacred inner sanctum of technology. It isn't difficult to retrieve an occasional soldering mistake but if you get the whole board wrong you can't unravel it like a badly knitted woolly.

At least the act of soldering holds no mysteries. Try to sit with a draught taking the air away from you or the famous smell will grip your nose and the smoke will bring tears to your eyes. And something mindlessly rhythmic in the background can be a help—tennis on the TV, perhaps, or a Uriah Heep LP. All you need is a steady hand and an appreciation of the joy of dull, repetitive manual labour.

After the sockets you move on to the resistors, colour-coded and as pretty as a child's jewellery. Here you'll need wirecutters, and don't throw the pieces of wire away—you need three of them for links

later (the manual says four but if you can find LKNM1 on the board please write to Microtan asking them to print it on all of them.)

After the resistors the capacitors, and after them the diodes of doubtful polarity. By now the end is in sight and these fiddly bits are like a rest cure after the 14, 16, 20 or more pins of each socket. The transistors and the crystal lead you to the final items—the UHF modulator and the edge-connector. This last unit has upwards of 60 pins, and after that you've earned a rest.

All that remains is to fit the chips into the sockets—the right way round, and of course the right sockets. The mystery of the Pin 1 identifier re-surfaces. What can you do except fit the chips all the same way round and hope for the best?

The chips, incidentally, are like a geography of the world's sweat shops. They come from El Salvador, Indonesia, Singapore, the Philippines, Malaysia, almost everywhere in the free world where freedom means the opportunity to work for American multinationals at pitiful wage rates.

At the end of the manufacturing process, when you sheathe your soldering iron and apply a dab of Vaseline to the last burn, it's time to take stock. In the literal sense this means checking that there are no bits and pieces lying around that should have been welded to vital parts, but the

'All you need is a steady hand and an appreciation of the joy of dull, repetitive labour'

metaphorical sense is more restful—it involves sitting back and drinking in the satisfaction of a job well done.

There is one drawback. Until you acquire a keyboard, a power supply, a monitor, associated leads, and a 13amp plug, you have no way of knowing exactly how well the job has been done. Don't let that put you off. A job should have a beginning, a tea break, and an end. When you've applied solder to so many points that the damage is irrevocable you can regard the job as finished. Let the quality control experts worry about the quality.

PRICES

Microtan board	£59.95
Tanex expansion board	£49.95
40K memory board	£79.95
Keyboard	£79.95
TANDOS	£99.00
Colour VDU board	£89.95

SPECIFICATION (basic system)

Price	£59.95
Processor	6502, 1MHz
RAM memory	2K expandable to 48K
ROM memory	2K expandable
Text format	32 × 16 b/w
Graphics screen	64 × 64 b/w (colour and hi-res options)
Keyboard	optional
Storage	cassette, 300 baud
OS/language	Basic
Distributor	Microtan Computer Systems, Dulwich. Tel: 01-693 1137
Software included	None

Richard King looks at BCPL, a new language with tinges of B and C. But is it X-rated?

Program developed — as easy as BCPL?

Acornsoft's BCPL is one of the pieces of advanced software which has so long been promised for the BBC. It's a systems language, meaning that it's intended to be used for writing the more fundamental kind of software, such as editors, compilers, DOS programs, and even languages. It isn't really intended for learning to program.

Users ought to be fairly conversant with machine-code — but it isn't absolutely essential, but you should have a solid understanding of compilers, linkers and other such.

The actual language was first designed some fourteen years ago by Dr Martin Richards at Cambridge University, and is not totally unlike B, which is also a precursor of C, in which the Unix operating system is written.

The version tested is meant to run on a BBC Model B, though it will run in a limited fashion on a Model A, consists of a ROM chip, which plugs into one of the 'sideways ROM' sockets on the BBC, and a 5¼in disk. BCPL is a complete systems-development environment, with an improved OS, two very sophisticated editors, a compiler, assembler and linker, as well as a library and support routines.

Features

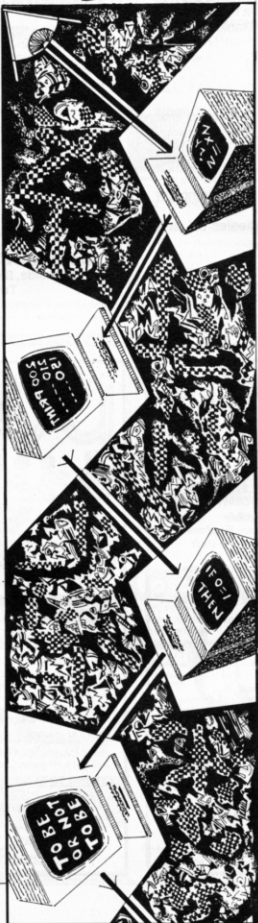
It includes a selection of programs with which a textfile can be written, stored, compiled, linked, run, tested and debugged.

The first program which will be run after the system is booted will probably be one of the editors, ED or TED (Tiny ED). The former is quite something.

With this feature, it is possible to perform such complex operations as converting a program-file from one dialect to another, or even to another language. Naturally, if you get one of these wrong, the result is that your program looks like it got hit by a train! In this case there is no chance to recover, so the only hope is to make a backup after every successful operation.

Once the textfile is complete, it is submitted to the compiler, which outputs a tokenised version of the final program. This will eventually be in Cintoce (Compact INterpreted Code), which is a 'pseudo-code' for a 'pseudo-machine'.

The tokenised hex is loaded, relocated to the desired place in memory, then the relocated hex is linked into the system. Saving it will produce a binary image which can be run as a normal machine-code



program, even though it is in fact interpreted, and part of the linking process is to connect the interpreter with the code. The result is a compact and reasonably fast program, which to all intents and purposes can be considered a stand-alone program.

It is also possible to include copies of suitable routines in the final code, thus making it truly stand-alone, but naturally, it will also be bigger, due to the extra routines. This puts a top-limit on just how big a program you can write. In fact, there's also a limit on how many lines can be compiled at one go. The book says that it's about 200 lines of source-code on average.

The combination of these two limitations means that it will not be easy to develop very large programs without considerable care, though this will be possible, since BCPL has the ability to handle overlays and co-routines.

One thing BCPL doesn't have is the ability to generate 6502 machine-code from the compiler. The authors say that this is because the 6502 is a pig of a machine to write compilers on. Be that as it may, far too many entries in the BCPL procedure library are labelled as being 'specific to this implementation'.

Presentation

The system comes in a kind of library-case which holds the book and the ROM-chip. The documentation to the system is a very fat book, called *BCPL for the BBC Microcomputer* by Chris Jobson and John Richards. The system is rather better documented than any such programs; it certainly can't hurt for the implementer and the documentor to have a very close understanding of the intentions of the originator.

It launches into the main topic, what is BCPL and how it is used, almost on the first page, and the answers assume a fair degree of knowledge. They don't bother to explain binary, Hex or anything else at that level. This is just as it should be. It is quite clearly intended for experienced users, and they are not going to tolerate a lot of stuff they know already, especially if it gets in the way.

My main complaint about the documentation was the binding. I found the thing so fat that it wouldn't stay open on the page, and I'd have preferred the ring-binding which was used on the BBC machine user-guide.

Getting started

Getting the system up and running is a

kemp

"On a large computer system, a file of this nature would cost between £150-£700".

"The packaging is superb". "Excellent documentation".

The above comments buy the UK's two main software wholesalers on one of our programs confirm our belief that we offer the best quality business software available on any small micro. Our programs provide the facilities of expensive systems at a fraction of the usual cost. Our programs are now available NATION-WIDE.

Purchase Ledger (amounts payable)

Sales Ledger (amounts receivable)

Stock Ledger (Stock recording)

Stock Control (2 second access time, over 500 items per file, unlimited entries)

(Ledger Programs — Up to 250 accounts, up to 1200 entries per month). Only £14.95 each (48K Spectrum only).

Available at Selfridges and at all good computer shops.

Nationwide distribution by Microdealer UK and PCS Distribution.

Kemp Limited
43 Muswell Hill, London N10 3PN
Hotline: 01-444 5499

NOW AVAILABLE !!

BCPL for the BBC Micro

- ★ Excellent Disk based development environment
- ★ Works with Tape, Disk, Econet and 6502 2nd Processor
- ★ BCPL Programs can run in any BBC Micro
- ★ Published by Acornsoft
- ★ Developed by Richards Computer Products

BCPL for the BBC Micro includes a BCPL Language ROM, a 450 page manual, and a utility disk containing a full screen editor, compiler, 6502 assembler, other utilities and debugging aids. **£99.65**

BCPL Language ROM is also available separately, to run BCPL programs and to provide its useful built-in facilities such as Files in Store. Minimum order 4 ROMs. **£26.45 each**

BCPL Calculation Package provides accurate floating point, decimal fixed point, and fast graphics calculations. Available shortly. **£19.89**


BCPL Stand-Alone Generator will allow BCPL programs in any BBC Micro, without requiring the BCPL Language ROM. Price includes licence for noncommercial and limited commercial distribution. Available Autumn 1983. **£49.83**

All prices include VAT, please add £2 for postage.

Richards Computer Products Ltd.,
Brookside, Blewbury, Didcot, Oxon OX11 9QA
Telephone: 0235 850218

VIC 20 DIGITAL CASSETTE DECK AT A REALISTIC PRICE

ALSO COMMODORE 64 + PET **£29.99 + £1.50 P&P**

- TRADE ENQUIRIES WELCOME
- 
- Fully Compatible
 - Designed by our Engineers — NOT just an Interface unit
 - All Cables Included
 - Powered and controlled by your computer — SIMPLY PLUG IN!

SPECTRUM QUICKSHOT JOYSTICK

- Interfaced to plug straight into SPECTRUM
 - Compatible with most software from: Quicksilver, Silversoft, Artic, New Gen etc., etc.
 - Other Programs easily modified
 - Full Instructions
 - Quicksilver for Atari/Commodore + £1.50 P&P
- 
- ONLY **£19.99** + £1.50 P&P

* Interface unit only available for use with your own Atari type Joystick only + £1.00 P&P

Credit Card Sales Line 24 hours 0782 273815   **DATEL ELECTRONICS** 27 HOPE STREET, HANLEY, STOKE-ON-TRENT TEL. 0782 273815 PCN/30/6/83

YEP FOLKS — IT'S HERE

AVAILABLE NOW
Spectrum 48K
Dragon
Com. 64

CALIFORNIA

GOLD RUSH



HOWDE DO PARTNERS

This here's Prospector Jake. I sure am havin' one helluva time tryin' to peg ma claim with those damned injuns a hootin' an' a hollerin' all over this territory. Ma job gets harder as I move from one Gold Field to another. I know, that is me an' ma stubborn homery ol' Mule here know of 24 rich an' I mean rich seams of pure Gold. All it needs to make this here of 'critter happy is that you help me peg every doggone last one of them claims.

Can YOU help Jake become rich, help him peg his claim, dodge the arrows, avoid the tomahawks, and plant the Dynamite in just the right place? . . . YOU CAN!!!

YIPPEE . . . Git yer Picks an' Shovels and join the CALIFORNIA GOLD RUSH . . . NOW

Amazing Arcade Action . . . Stunning Sound and Graphics Available NOW for Commodore 64, Spectrum 48, and Dragon

£29.95 including P&P

SPECIAL OFFER **SPECIAL OFFER** **SPECIAL OFFER**

Order CALIFORNIA GOLD RUSH before September 5 and get a 10-game Cassette of terrific games . . . **FREE**

COMING SOON

LEAPIN' LANCELOT: Medieval Machine Magic to enthral you GALACTIC SURVIVAL PAK: Every Astro-Traveller must have this!



We always need Dynamic Dealers and Imaginative Writers

Please rush me the CCR for (price) _____
 I enclose (check one)
☐ Please make cheque and P.O. payable to ANK
☐ Enclosed is cash
☐ Enclosed is credit card
 Name _____
 Address _____

matter of finding the installation section, neatly buried as chapter 9, and putting the ROM (carefully) in one of the sideways sockets at the front left edge of the board. If the ROM is installed at the leftmost socket, it will be used as the 'boot system', otherwise it must be called up with a *BCPL system-command, which will respond with a ! prompt.

It is now in the command state, and most of the * type calls work as normal. There is also an extended command-handler, which has several useful utility-commands, and unlike in Basic, it is not necessary to specify a RUN "program" ... just typing in the name of the program will run it by implication, rather like CP/M, so any program-files on the disk become effectively built-in.

But the system is considerably more advanced than CP/M. In particular, there is the concept of there being more than one valid program in the machine at one time. This is true of CP/M, and most other operating-systems, but in the BBC BCPL system the program running in the command-state is suspended when the run-state program is executing.

The interesting detail is that the user (run-state) program and command-state programs can swap between each other, so effectively multi-tasking. The same mechanism is used to co-process several jobs at once, and the system is able to handle the re-entrance problems which go with this technique, so the programmer generally needn't concern himself too much about the mechanics.

There's a bit of a shortage of backup — apart from the manual, I could only find *BCPL — The Language and its Compiler* by Martin Richards & Colin Whitby-Stevens, published by Cambridge University Press, on the subject.

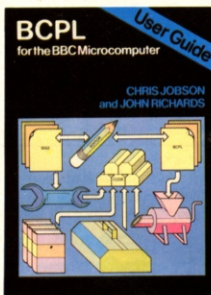
Performance

In action, BCPL is good, or could be in the hands of a good programmer with time and ideas. All that can reasonably be done through calls to the MOS is well documented, as is much of the internal workings of the interpreter.

It isn't really possible to comment too deeply on a language/OS combination without spending plenty of time on it, because such snags, quirks, bugs, and oddities are bound to lurk in wait don't leap out at first. If they did, the system would be unusable.

I was very impressed by the de-bugging facilities. It has the ability to report what's happening with the names used, instead of the addresses, as well as to count how many times a procedure is used. I'd like this in my own system. Unfortunately, though it's terribly clever, it is a bit of a luxury, and gives a clue as to the thinking surrounding the BBC, which goes off on clever tangents without checking that the groundwork is solid.

As with most operating systems, there isn't much in the way of a user-interface. In BCPL it's an '!' prompt and a command-interpreter which replies with rude messages when you get things wrong.



The most important detail is the Escape key, which causes a program-interrupt, suspending the current program and returning to the previous state, which will generally be the command-state. If it's pressed while a line is being input, then it acts as a CANCEL, ignoring any characters already entered.

Flexibility

Flexibility comes in two flavours with things like BCPL. On the one hand it is an operating system, and on the other it's a language.

The BCPL operating system is magnificent. In fact, it's effectively a whole new machine, and apart from the limitation of 31 files per disk, which comes courtesy of a pitiful excuse for a DOS, the DFS, it's a great improvement.

There are several new commands, two editors, and a whole bunch of utilities. The complete system is as good as any other available on the smaller micros like the BBC, Apple and so on, and considerably better than some, even on bigger machines.

Of course, this power is not always easy to call up and control, and on any other system I'd suggest a set of carefully written EXEC files, so that big, complex jobs could be run in batch-mode.

With BCPL as it stands the complex syntax, which isn't particularly uniform, has to be typed in a lot, try:
BCPL/F source/S.object MAX REPORT
=/L
JOINCIN/F.b.piece/S.object AS/F.pro-gram

This will take 'source' from the current filing system, compile it and put the object-code into the STORE, won't read in routines from the library until needed, so memory isn't used up too fast, put out a compilation-listing on the printer, then link 'b.piece' from the current system and the bit just put into the STORE, and write 'program' onto the current system.

As a language, it isn't quite as good, especially if you believe the claims made about portability. Provided you stay on the BBC it'll be OK, but don't get too many big ideas.

This is because there's much too much of the supporting structure labelled as being implementation-dependent. There just isn't any excuse for saying that START, which actually starts a program running by calling the interpreter, is liable to pick up its parameters in an unpredictable way.

Reliability

The system is pretty tough, as it should be, but there's a couple of real horrors. Would you believe that *BACKUP, *COMPACT and *COPY (all DFS calls) actually overwrite the heap, causing a total and irrecoverable system-crash?

The only way out is to hit BREAK. These calls are almost certain to be needed in a system program, and to let a fault like this through, thus forcing the programmer to invent them for himself, is quite unforgivable.

Verdict

As a language, BCPL is acceptable, particularly for its intended use. It has pros and cons, but overall, I'd not rate it as highly as a good C, which it resembles quite closely.

This is for two main reasons. First, it doesn't offer the programmer as uniform and consistent an interface on a range of machines as C does. The large number of routines which cannot be relied upon to be present means that even if you don't want to, you'll wind up doing a lot of systems work in it, just to make sure that the code is there to do the jobs you will inevitably need to do.

My, second reason is the muddled thinking that seems to underly parts of the system. The book says that BCPL is an 'untyped' language, and that all data is held as 'cells' of two bytes, which may thus be used as integers, pointers or anything else which will fit into sixteen bits, and that the programmer is responsible for making sure that he's doing what he wants with it, and that it's in the right range.

This approach has many merits, but the integer-only arithmetic can get a bit cumbersome. Granted, long-integers, reals and so on are not often needed in systems, but somebody must feel they're necessary, since there is a set of floating point routines in the library on the disk.

However, there is no implementation of C on the BBC, and BCPL is an adequate systems-programming system.

Certainly, it's as good as similar products, such as the UCSD p-System, Whitesmith's C, Aztec C, APEX/XPLO and the like, several of which are much more expensive.

RATING

Features	4
Documentation	4
Performance	4
Usability	3
Reliability	3
Overall value	4

Name BCPL System BBC Model B with disk-drive **Application** Systems language and environment **Price** £99.95 **Supplier** Acornsoft

The new Electron from Acorn.

Ask any child at school why it's worth £199.

Most British children have one thing in common with the new Electron microcomputer: they speak the same language.

You see, the Electron is the first micro remotely in this price range to use BBC Basic, the computer language that is rapidly becoming the standard in British schools.

But that's not all. Most children will feel at home with the Electron as soon as they lay hands on it.

This is because it has developed out of the Micro that has been chosen by over 80% of schools participating in the Government's current Micros In Schools project. It has a similar keyboard and has most of the functions of this much acclaimed (but naturally, more expensive) machine.

So now children will be able to continue their computer studies at home. They'll be able to use the same educational programs they use at school. And, if asked nicely, they'll be able to help willing adults take their first steps into computing.

All this for only £199.

A micro technology break-through.

And now a few reasons for adults why

NOW YOU'VE MASTERED MONSTERS,
WE COULD MOVE ON TO MONEY
MANAGEMENT.



the Electron is such an exceptional machine at the price.

The Electron is neat and compact. Yet it is fast and powerful. (Full details, for the technically minded, are in the box opposite.)

It produces high quality sound using its own internal speaker.

And it offers a range of facilities many larger more expensive machines just cannot match.

For example the Electron's colour graphics have the highest resolution of any home computer.

This is because the chip that controls the graphics, specially designed by Acorn, is one of the most advanced of its kind. As a result, the Electron delivers twice as many characters across the screen as its closest competitor.

Built to last and to grow.

The Electron has been designed and built to be a permanent part of the family, year in year out.

Particular care has been paid to the keyboard. It is electric typewriter style, robustly constructed with a good, solid 'feel'. It has a space bar, and single entry keys for key commands.

In other words it's comfortable and easy to use, avoiding the need for the manual gymnastics sometimes associated with calculator style keyboards.

And it will grow with you via expansion modules, that Acorn are developing, to take peripheral additions such as printers and disc drives. So as your knowledge, interest and ambitions develop, the Electron can develop with you.

Additionally, to give you all the support you'll need to generate your own applications software, we've established a phone-in service attended by specialists to give advice, encouragement and practical help.

A gentle teacher.

The Electron plugs straight into virtually any TV set and cassette player so you will be



ready to go as soon as you get it home.

It comes not only with a comprehensive user guide, which describes the machine and its functions, but also with a book that takes you step by step through the basic principles of programming.

A free taste of its versatility.

You will also receive an "Introductory" cassette which will put the Electron through its paces showing you a little of what it can do with its 64k of memory (32k ROM, 32k RAM).

The cassette will give you a taste of those exceptional colour graphics we mentioned earlier; of its ability to play and notate music, and show you how it might help in home accounting. It will challenge you to a few games and will, if you ask it, do your whole family's biorhythms in a matter of seconds.

You will in short, through the 15 separate programs it contains, get a glimpse of the Electron's potential. But only a glimpse, for that potential is as limitless as your own interest and imagination.

A widening range of software.

To help you realise some of that potential, Electron software already ranges from "Personal

Money Management" through "Starship Command" to "Creative Graphics" (which, incidentally, includes some spectacular three-dimensional rotating shapes). Naturally, with its strong educational links, educational software will be extremely

EXPERTS LIKE 'WHAT MICRO?'
AND I RATE THE ELECTRON
HIGHER THAN ANY OF THE
COMPETITION.



important for the Electron and even now O and A Level revision papers are being processed for Electron users.

How to get your Electron.

The Electron is available from selected WH Smith and local Acorn stockists. However, if you would like to order one with your credit card, or if you would like the address of your nearest supplier, just phone 01-200 0200.



Technical Specifications

Hardware

2MHz 6502.
32k ROM 32k RAM (64k total).
High resolution graphics 640 x 256 max.
Seven display modes.
8 colours and 8 flashing colours.
1200 baud CUTS tape interface with motor control.
Expansion bus for add-on interface modules.
Internal loudspeaker.
PAL UHF output to colour or black and white domestic TV.
RGB output for colour monitor.
56 key full travel QWERTY keyboard with spacebar.

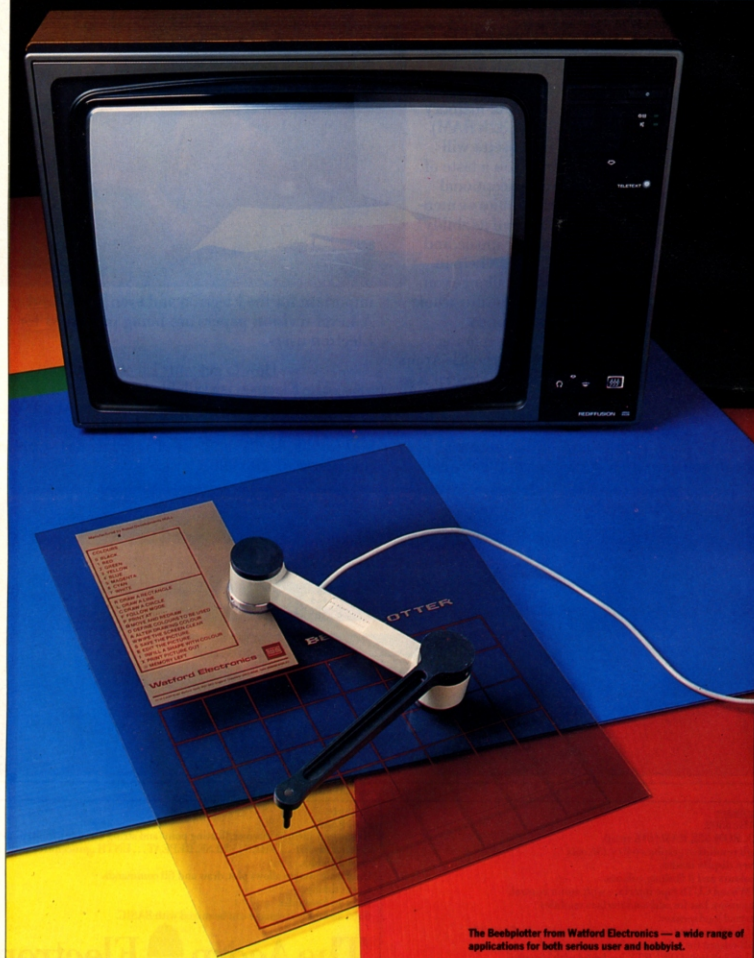
Software

BBC BASIC.
Extensions include interger, floating point and string variables, multi dimensional arrays; IF... THEN... ELSE, REPEAT... UNTIL, procedures with local variables.
Operating system allows plot, draw and fill commands.
Event timing.
Built-in assembler.
6502 assembly language can be mixed with BASIC.

The Acorn  Electron.

David Summerfield and Richard Blue trace the pictorial potential of the Beebplotter.

The Beeb shapes up



The Beebplotter from Watford Electronics — a wide range of applications for both serious user and hobbyist.

The BBC micro has attracted a significant number of peripheral devices, courtesy of various independent manufacturers, as the micro makes inroads into the apparently booming education market. This is a welcome development for the educators (and Acorn) but it also increases possibilities for the non-institutional BBC owner.

The Beebplotter is a recently-developed tracing device for the BBC very much along the lines of the RD Digital Tracer (reviewed in *PCN* issue 24). With it you can trace the outlines of shapes from paper (or straight from your imagination) on the screen and then save them to disk or tape and/or output them to a printer.

The devices represents a big improvement over the cumbersome MOVE, PLOT and DRAW commands which BBC users are otherwise constrained to use if they want to do some drawing on the screen. The other alternative is to purchase a simple draw-with-joystick program — but this technique lacks the tracer's precision and flexibility.

Design

The Beebplotter is designed for use in schools and is suitably tough. It has a large perspex base onto which is fitted an arm with a stylus at one end. This can be moved around an A4-size sketch pad area. The arm has two variable resistors as joints. When it is plugged into the BBC's analog port, the values of the resistors are read in and the position of the stylus calculated.

This gives a direct relationship between the position of the stylus and that of the cross-hair cursor on the screen. Drawing is then a matter of moving the stylus over the base board rather than guiding a cursor around the screen with the arrow keys on the keyboard or with a joystick. This makes the Beebplotter ideal for copying pictures, maps or diagrams into the computer by tracing round their outlines with the stylus. The clear base means you can put the Beebplotter over any book too thick to fit between the stylus and the base board.

The Beebplotter comes in a stiff brown cardboard box that looks as though it would stand up to the worst efforts of the Post Office. It is supplied complete with a lead to plug into the analog port of a 32K BBC, a cassette of software, clear manual, dot-to-dot picture of a steam train that lets you practice using the system and a demonstration program which draws a map of England and Wales.

In use

The Beebplotter can be used in any of the BBC's five graphics modes (0,1,2,4,5) although flashing colours are not available. The choice of mode, as usual, is a compromise between resolution, amount of memory left for the data and number of colours available.

The software supports several commands although notably not 'delete last point'. There is a quick reference list of these printed on base board. Unfortunately the commands must be selected from

keyboard rather than by pointing to them on the base board with the stylus. That means you have to keep glancing at the keyboard to find the right letter for the next command you want to use.

To draw rectangles, lines or circles the cursor is moved to the corner, end or centre respectively. Then as the cursor is moved around the screen a flashing shape follows it and can be fixed by pressing the space bar.

Alternatively the 'follow mode' can be used. This lets you trace out irregular shapes, as movements of the stylus are directly converted into lines on the screen.

However, the lines on the screen can be even more irregular than the shape you are trying to trace. One of the variable resistors on the Beebplotter we tested was stiffer to move than the other, making it difficult to draw smooth lines.

Text may be included in diagrams, although if you later redraw the picture in a different mode the relative size of the letters changes. Enclosed shapes can be filled with colour quickly using the INFILL command. However, if the shape is too complex, the program sometimes can't cope and crashes.

Pictures can be saved quickly to tape or disk, as the series of commands entered is stored rather than the whole of the screen memory.

Routines are included on the program tape which allow you to incorporate pictures drawn on the Beebplotter in your own programs. Finding the start of a data file on tape is made unnecessarily difficult as the program 'hides' the information the BBC normally displays when loading from tape.

As the pictures are saved in data files a bug in the old (0.1) BBC operating system will often cause data to be lost. When disks are used the DFS workspace must be overwritten if modes 0, 1 or 2 (20K high resolution modes) are to be used. This means high resolution pictures cannot be saved to disk.

However, the program lets you move data easily from tape to disk. The amount of free memory can be displayed at any time by pressing the '@' key, and when running the program there seemed to be enough memory available for most pictures.

The software allows you, without clear-

ing the screen, to clear the area of memory in which the command sequence used to draw a picture is stored. This lets you load in a second set of data to overlay the first picture, which means that if a picture you are trying to draw will not all fit into memory at once, it can be split up into separate sections.

The demonstration program supplied uses this feature to first draw a map of England and Wales and then to superimpose the rivers.

Unfortunately the only way to edit pictures involves going through every command entered so far and telling the program if it is right or not. This is particularly annoying as each section done in follow mode counts as one command.

Commands are supposedly provided to copy sections of a picture from one part of the screen to another. These would save both time and memory space, but we couldn't get them to work.

The manual gives listings of routines in Basic which can be added on to the end of the main program to dump the screen to either a Seikoso or Epson dot matrix printer. The one for the Epson, which we tested, did not work.

Verdict

The Beebplotter has been designed for use in education, not computer aided design, and it is probably tough enough to stand up to use in schools.

The hardware is let down by unpolished software which neither provides a full set of facilities nor is crash-proof (or even crash-resistant).

Applications seem limited as it is difficult to trace smooth lines in follow mode or to get straight lines vertical or horizontal without a step in the middle. But it's excellent for drawing maps of countries with wiggly borders. At £59 plus VAT the system seems to be poor value for money compared with joystick-based programs for less than £20, unless the Beebplotter's particular ability at tracing existing diagrams is required.

Item Beebplotter Price £59 + £3 P&P + VAT
Machine BBC micro with 32K RAM and analog port **Contact** Watford Electronics, 33/35 Cardiff Road, Watford, Herts WD1 8ED, tel (0923) 40588

CHOOSE YOUR GRAPHICS MODE

R — Draws a rectangle L — Draws a line C — Draws a circle D — Defines colours A — Alters drawing colour W — Wipes the screen clear S — Saves the picture E — Edits the picture I — (In)fills a shape with colour X — Prints picture out @ — Prints memory left

	Colours used	Horizontal resolution	Vertical resolution	Memory used
Mode 0	2	640	256	20K
Mode 1	4	320	256	20K
Mode 2	8	160	256	20K
Mode 4	2	320	256	10K
Mode 5	4	160	256	10K

The Beebplotter has different capabilities when used in its five available BBC screen modes. As you can see available colours are traded off against horizontal resolution, or in the case of modes 4 and 5, against memory.



MICROTANIC

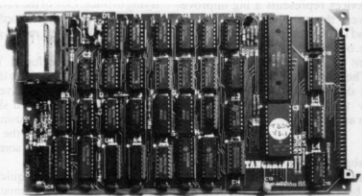
COMPUTER SYSTEMS LTD.



IF YOU WANT FLEXIBILITY AND EXPANDABILITY THEN YOU WANT THE **MICROTAN 65**

Start by
building your
own computer

**FOR LESS THAN
£60**



EXPANDABLE — from 1K to 256K

FLEXIBLE 6502 system with the following options:

Parallel I/O Board

Serial I/O Board

Disc Controller

Real Time Clock

Eprom Programmer Card

Colour Graphics

Sound Board

32K Romboard

32K Ramboard

ASCII Keyboard

Building into a Disc-based system with a stylish System Rack to take whatever brands suit your needs.

FULL RANGE OF SOFTWARE AVAILABLE

ALL BOARDS AVAILABLE IN KIT FORM OR FULLY BUILT

LANGUAGES AVAILABLE: MACHINE CODE · ASSEMBLY · BASIC · FORTH

DEALER ENQUIRIES WELCOME



SHOWROOM:
16 Upland Road,
Dulwich, London SE22

MAIL ORDER:
235 Friern Road,
Dulwich, London SE22

TELEPHONE: 01-693 1137



Henry Velleman shows you how to convert your Pet into an 8032 with the help of Microport.

If you are the owner of a small (9 inch) screen CDM/Pet you may well be feeling that technology, and Commodore, are rapidly leaving you behind.

It's three years since the introduction of the 8032, 12 inch screen, 80 column business computer, and the majority of non-games software for the CBM range since that date has been oriented heavily towards this 'upmarket' model. Just in time to save you from upgrading to a 64, Microport has produced a Printed Circuit Board (PCB) which fits inside all but the very early 40 column CBM/Pet's and converts them in all respects, except of course screen size, to an 8032.

Microport has been actively involved in add-ons and repairs for the Commodore range since the late seventies. As supplied, the conversion consists of a main PCB, a smaller PCB which fits onto the outside of the computer with the 40/80 column switch, 5 connecting leads, and a small block of black conductive foam. Don't be hasty and throw the foam block away as mere packaging, it actually performs an essential function in providing a ground path between the screen and the main board which Commodore never envisaged as being necessary.

Detailed instructions are supplied, explaining the steps necessary for installing the conversion, and while no drastic modifications are required to the original circuit board, I think that the majority of owners would be happier to take advantage of Microport's free fitting service.

If you do decide to fit the kit yourself then be advised to read the instructions through carefully several times until you are sure they are clear to you. I emphasise this point as I feel the instruction leaflet sets out to be over helpful with all sorts of technical asides which serve only to stray the mind from the important task at hand.

Switching on

The fitting of the conversion should physically take about half an hour. Switching on the power in 40 column mode gives you exactly the machine you had before you started. Switch off, select 80 column mode with the single switch on the right-hand-side of the case, power-up again and you're into a completely new ball game.

Apart from the obvious fact that the characters are approximately half size they are also styled differently, as Microport supplies a character set based on that in the 64, making text clearer at the reduced size. Although I didn't find it necessary, the instructions state that you may need to re-align the screen to position both the 40 and 80 column display centrally.

The 80 column display has both a standard and an expanded mode in which lines of text are moved further apart. Should this re-alignment be necessary then it must be carried out by a suitably qualified person, as it involves adjusting high voltage parts of the video display.

The keyboard of the 40 column CBM/

Widen your horizons with a bigger Pet



Pet is not the same as the 8032. Microport has got around this by implementing the never-used (by me anyway) shift lock key as a control key. By combining this with other key sequences, eleven additional editing facilities are available. These are adequately described in the instructions. These facilities are a toggle between graphic and text format, scroll screen up or down, set and move to TAB, an escape quotes mode, set top and bottom corners for window facility, and finally delete line to or from cursor. All these features can be used under program control, except escape quotes, and appear in the conventional Commodore reverse field format in PRINT statements.

A BELL is implemented on CB2 sound which chimes on power-up. It is also available to provide simple sound in your

programs. All keys have an automatic repeat if held down. If you don't have sound then Microport sells a 'sunder' for just £4.50.

One of the most useful features is the ability to set screen windows. If you don't know what a screen window is then let me explain. By specifying corner points, any size and shape rectangle can be set on the screen as the only area of the screen that is active. If you then list or run a program it will only appear within the restricted area you have selected and the rest of the screen will remain frozen with the image that was on it at the time the window was set up. Some amazing effects can be created with this facility, especially when combined with the scroll up and scroll down commands.

Options

In addition to the switchable conversion tested, Microport makes a standard 80 column board for £15 less which makes your machine permanently into an 8032. Several options are offered at a small extra cost. These include a dual character set ROM and also an additional 2K of video RAM which allows instantaneous switching between two different screens. If your machine does not already operate on Basic 4.0 then you will need to upgrade at a cost of £49.

Conclusions

The Microport conversion produces an exact software replica of the Commodore 8032 and is able to run any Basic or machine code program written for this machine, including compiled programs. It is even possible to add a 64K RAM board and so upgrade to an 8096.

Whilst the 80 column display is on the small size it is more than acceptable and I would rate this product as a very cost effective solution for those CBM/Pet owners needing an upgrade path, particularly with business software in mind.

Finally, if you belong to the Independent Commodore Products User Group (ICPUG) then Microport will give a 15% discount.

Item Microport 80 Column Switchable Conversion **Machine** CBM/Pet 9 inch Dynamic RAM Computers **Manufacturer** Microport Microcomputer Services (01-953 8385) **Price** £164 plus VAT.



Your starter for £150.



This complete starter pack for the price you'd expect to pay for a computer alone.

It's a complete computer system: the Commodore VIC 20 computer, a cassette unit, a simple explanation of computer programming (called "Introduction to Basic Part I"), plus an exclusive compilation tape of four computer programs (Blitz, Type-a-Tune, Race, and Hoppit).

And all for just £149.99 or less.

It's a terrific opportunity to introduce yourself, and all your family, to the exciting world of home computers—and with what has been described as the best home computer in the world.

The VIC 20 has educational programs for all ages (spelling, physics, arithmetic, etc.), plus music, typing, chess and home accounts. There are special programs like Robert Carrier's menu planner and BBC 'Mastermind', and not forgetting, of course, lots and lots of wonderful arcade games.

You'll very soon be exploring new worlds of colour, animation, and sound. Not just with a vast choice of programs, but with unlimited scope for expansion in the future.

The VIC 20 is the perfect computer

to start with because you can keep adding to it, and so get even more enjoyment out of it.

There are printers, disk drives, memory expansion packs and many other peripherals to choose from.

Which means, as your confidence grows, so can your VIC 20.

Get the VIC 20 starter pack today, and we promise you'll never look back.

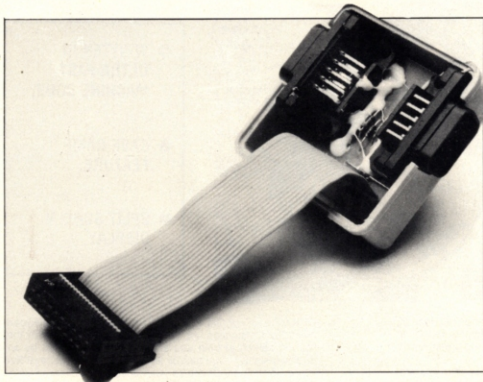
commodore
VIC 20

**The best home computer
in the world.**

YOU CAN SEE THE VIC 20 STARTER PACK AT ALL BRANCHES OF DIXONS AND WALLACE HEATON, AND AT SELECTED BRANCHES OF BOOTS, RUMBELOWS, LASKYS, CURRYS, GREENS, ORBIT, MENZIES, LEWIS'S, MAKRO, TESCO, FINE FARE, WIGFALLS, SPECTRUM, COMET, JOHN LEWIS, WOOLWORTH, REDIFUSION, CO-OP AND OTHER GOOD RETAILERS. ALSO AT BRANCHES OF A NATIONAL NETWORK OF COMMODORE COMPUTER DEALERS.

Pase has beaten Oric at its own game with a joystick interface for the Oric 1 — David Janda reports

Chocks away for the Oric



The Oric-1 has become known to many as a games machine. It's hard to remember now exactly what the expected market for the Oric was, but my impression at the time was that it was a machine on which computer newcomers were expected to learn Basic programming, much along the lines of the Spectrum.

The Oric, of course, was also expected to accumulate a smattering of peripherals courtesy of Oric Products. Little emerged except the recently released Oric printer (PCN, Issue 21).

Arch-rival Sinclair Research meanwhile (no doubt partly prompted by the impressive demand for joystick controllers being met by independent manufacturers) is putting the finishing touches to a second interface for the Spectrum. Sinclair's Interface 2 will involve a pair of joystick controllers.

Joysticks appear to have been underrated by manufacturers in their rush to provide high-resolution colour graphics and sound. It's therefore no surprise to learn that a joystick interface has been released for the Oric 1 by an independent manufacturer.

Pase released its joystick interface at the Earls Court computer fair earlier this year. The joystick interface consists of a small cube about the size of a matchbox which attaches to the Oric's printer port by a short

ribbon cable. There are two 9-pin male sockets for the Atari-type joysticks which are used with the unit. These joysticks seem to have become the standard, and it will be interesting to see which type Sinclair will choose.

The interface is made of plastic, and is very light and unobtrusive — once attached to the back of the Oric you can probably forget it's there.

Because the unit is attached to the printer port, it's not possible to use the printer. You may also come across problems using sound.

Games enthusiasts will no doubt be

interested in this product as several houses have decided to make their games compatible with it — Salamander Software and IJK are two examples. But how universal it will eventually become, especially if Oric decides to come out with a contender, is hard to tell. This is one of those chicken and the egg situations.

Compatible software will equal joystick sales and vice versa. If one doesn't do too well the other gets dragged down with it, leaving the user the loser — no commercial games software.

However, it is possible to make an interface work without pre-prepared software. To achieve this, Pase includes a four page instruction sheet which gives details of how to make a patch to the Oric's system interrupt routines. Two small program loaders are also included.

Using these it is possible to PEEK locations 400 and 401 hex to find the status of the interface. When the joysticks are used, a value is returned to either of the addresses and your program can act accordingly. Details of how to set up the patch and how to interpret the returned values are included within the documentation.

The instructions point out that a possible ten values can be returned to the addresses. They are: NW, N, NE, W, 0, E, SW, S, SE and FIRE.

A free game cassette is included with the package, and this demonstrates the use of the interface. Looking at the listing will give users an idea of how to incorporate joystick routines within their own programs.

Pase is asking £14.95 for the interface, and on top of this there is the added cost of a joystick. A look at the inside of the interface reveals only a few pounds' worth of parts, and I feel it is over-priced, though Pase claims that the production costs are high.

Altogether the interface worked well, and I experienced no trouble with its operation. The only question mark concerns the durability of the flimsy casing.

Item Joystick Interface Computer Oric 1 Price
£14.95 **Manufacturer** Pase, 213-215 Market St.
Hyde, Cheshire, Tel 061-366 5935 **Outlets**
Various computer shops and mail order





MYSTERIOUS ADVENTURES



FOR BBC MICROCOMPUTER MODELS A & B

Join the growing band of Adventurers who are enjoying these absorbing and stimulating programs. Step into another world of Fantasy, Magic, Mystery and Sorcery. Only your wits and cunning can ensure success in these scenarios!



- WRITTEN IN ULTRA-FAST MACHINE CODE.

- SAVE GAME FEATURE.

- SPLIT SCREEN DISPLAY.

1. **THE GOLDEN BATON** — Venture into a strange province of Sorcery and Evil Magic to recover the Golden Baton, a priceless artifact whose powers are said to bring great Health and Prosperity to the Land.
2. **THE TIME MACHINE** — As a Newspaper reporter you are sent to investigate the eccentric professor who lives in the old house on the Moors. What is his secret and why is his house now deserted?
3. **ARROW OF DEATH (Pt. 1)** — A blight has fallen on your homelands, the Baton has become tarnished and now radiates a malevolent aura of Evil. Your mission is clear — trace the source of this Evil and destroy... or be destroyed. This is the first part of an Epic Adventure although each part can be played as a stand alone scenario.
4. **ARROW OF DEATH (Pt. 2)** — You now have the means to destroy your enemy... but you are far from home and this land is strange to you. Can you cope with the deadly perils which approach you and have you the strength to see your mission through to the final conflict?
5. **ESCAPE FROM PULSAR 7** — Alone on a gigantic Space-Freighter... The rest of your crew have died horribly at the hands of a mutated Zoo-Specimen. Your only chance of escape is to reach the Frail Shuttlecraft. But the lurking Monster is hungry and you are the only food it has left...

6. **CIRCUS** — Your Car has run out of Petrol on a lonely road miles from habitation. As you trudge reluctantly down the road in search of help you are suddenly confronted by an amazing sight... In a nearby field is a Huge Circus tent! But this is no ordinary Circus as you will soon discover...
7. **FEASIBILITY EXPERIMENT** — Far across the gulfs of time and space, a dying race of super-intelligent beings search the Universe for a Hero to save their existence... At length their thoughts turn to planet Earth. You are chosen to be their saviour in a bizarre scenario where death is a mere thought away...
8. **THE WIZARD OF AKYRZ** — You are in the Royal Palace. The King beseeches you to rescue his daughter from the evil wizard. If you succeed your reward will be priceless... failure will bring certain death.
9. **PERSEUS AND ANDROMEDA** — Travel into the realms of ancient mythology. Battle with grotesque monsters and supernatural powers as you search for the hidden secrets of myth and legend.
10. **TEN LITTLE INDIANS** — This mystery begins with a train journey into a strange country. What secrets are held by the strange country mansion? What meaning is attached to the strange idols? Maybe you will find out if you live long enough...

Each adventure comes attractively packaged for just £10.29 inc.

Available now for 48K Spectrum, Hi-Res Graphics



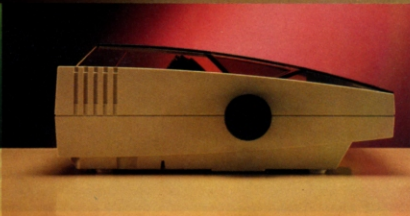
SEND CHEQUE OR P.O. TO:

DIGITAL FANTASIA

PCGI, 24 NORBRECK ROAD, NORBRECK, BLACKPOOL, LANCASHIRE.
Tel: (0253) 591402



THE MT80. SHAPED BY EXPERIENCE



You are looking at the sleek, ultra modern lines of the latest dot matrix printer from Mannesmann Tally; the people who probably have more experience in computer printers than just about anyone.

The MT80 is a high quality, low cost 80 column, 80 cps printer that will complement any of today's micros in looks and quality; in either the home or the office.

It has been designed with industry-

compatible interfaces in hardware and software.

Experience tells us exactly what you want from a printer - The MT80 has dual density dot addressable and line graphics. An easy change, long life cassette ribbon. It can handle both tractor-fed fanfold and single sheet paper. There is a unique quick tear facility giving you a clean cut along the entire width of the paper. And it even has an optional

sound reduction kit for those of you who like to hear yourselves think.

But best of all, it comes equipped with another valuable asset. A very attractive price tag.

Contact your nearest distributor or send for our colour literature.

Mannesmann Tally Limited,
Molly Millars Lane, Wokingham, Berkshire
RG11 2QT. Tel: (0734) 788711. Telex: 847028



MANNESMANN TALLY
CREATING THE RIGHT IMAGE IN PRINT



PRESTEL VTX 5000

offers the most sp under the Spec

"Prestel and the Prestel symbol are trademarks of British Telecommunications."
*Subscribers are responsible for quarterly Micronet 800 and Prestel subscription charges.

See us on Stand No. 439
Personal Computer World Show,
28 September - 2 October
Barbican Centre,
City of London

Micronet 800. The spectacular service that gives micro-users access to a huge database of information, hundreds of software programs, and communication with other users.

Sinclair ZX Spectrum. The home computer that's out-shone all its rivals.

Bring the two together and it's a combination that opens up a breathtaking new world of microcomputing possibilities.

Suitable for either the 16K or 48K versions, the Prism VTX 5000 modem was designed specifically for the Spectrum and fits neatly under the micro.

Plug the other end into the outside world via your telephone and your system will give you more than you ever dreamed possible.

Micronet 800 is fun, friendly and inexpensive to run. Choose from hundreds of free games, download and use them on your Spectrum whenever you like, play on-screen games (as easy – and inexpensive – as a local phone call), and compete in Big Prize games and quizzes. There's also a range of downloadable games you can buy for less than over-the-counter prices.

Learn through up-to-date education packages, and help run the household with simple business packages.

And if you need fast facts about the world of computers, Micronet 800 provides constantly up-dated product comparisons, reviews, prices, dealership and 'best-buy' information – 24-hours a day, 7-days a week.

You can access the whole range of Prestel™ information covering news, travel, holidays and entertainment, together with an electronic booking service.

Keep in touch – you can send electronic mail to any other Micronet 800 or Prestel user.

The VTX 5000 provides a full Prestel screen with graphics, and an off-line message composition facility for speedy transmission when you go on-line.

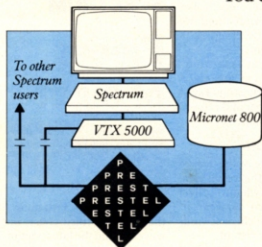
You can use the Sinclair printer to print frames and messages, or save them on tape for future use.

All this – and even more – as the service grows – would normally retail at the low price of £99.95 inc VAT.

But if you join Micronet 800 before September 30, we will make you a very special offer.

Micronet 800 will provide the VTX 5000 inclusive of VAT, post & packing and (if you need it) a free jack plug installation for the incredibly low price of £74.95 – a saving of £25 on the normal retail price.*

So don't delay – send the coupon today.



Micronet 800

Spectacular add-on

Spectrum.

micronet
800

☐ Please send me a complete Micronet 800 information pack containing details of Micronet 800 and the VTX 5000, and including a Micronet subscriber's application form.
☐ Please send me _____ (No.) VTX 5000 modem(s) at £74.95 each inc. VAT.
☐ I enclose a cheque made payable to Telemap Ltd. for £_____
☐ I wish to pay by credit card: Visa, Access, Diners Club, American Express.
(Delete as applicable) Amount £_____
My credit card No. is _____ Signed _____
Name _____ Address _____
Tel: _____

(Please allow
28 days for
delivery.)

BCN1/9

One of the many faces on Prestel. 800

Micronet 800, Scriptor Court, 155 Farringdon Road, London EC1R 3AD. Tel: 01-278 3143.

ZX ADVENTURES

SPECTRUM

Under the hill

Name Magic Mountain System
Spectrum 48K **Price** £4.95
Publisher Phipps Associates, 172 Kingston Rd, Ewell, Surrey, 01-393 0283 **Format** Cassette **Outlets** Mail order, computer shops.

Magic Mountain has been played on the ZX81 for two years and has been restyled with new graphics for the Spectrum.

Objectives

A sort of alter-ego introduces himself as your eyes and limbs, but you've got all the initiative. Your task is to direct your nameless chum to the Scroll of Wisdom secreted in the mountain. This journey is fraught, of course, with hidden traps and perils and your progress in overcoming these challenges scores you points out of 1,600.

While the program finishes loading, an impressively impregnable-looking mountain looms on the screen. During the game the colour graphics are very neat, with split-screen pictures used for many locations.

The first screen draws you a tunnel at the foot of the mountain in one half, while the other is used for you to conduct fast and fulsome conversations with the nameless chum. A wealth of caves of the hidden, musty and cold variety await you, along with all the other trappings of magic.

In play

A couple of pages of instructions and then you set off along what can become a weary, frustrating, baffling and very enjoyable trail.

The exasperation was exacerbated when I'd got him through a door and was trying very, very hard to cut a bamboo cane. Whereupon, after much fruitless effort, he inquired kindly, but thoughtlessly, if I were trying to open the door!

But then my short temper did get him killed by a dwarf. And my incorrect command to a genie saw the genie disappear, leaving behind a familiar and unpleasant smell. Death lies around many corners, and not usually as well deserved as in the dwarf incident.

The red and black maze took much patience and ingenuity, while the nameless chum stayed cool as a cucumber and refused to understand 'panic'.

Verdict

After much more of this sort of thing you'll find the way around and you'll learn what to collect when, and when to wear it. You'll find some clues obvious and others non-existent.

The graphics are neat and distinct, the responses reasonably fast and the challenge is well, but not too well, within the bounds of possibility. Baffled from early on you may be, but not bored.

Harriet Arnold

RATING

Lasting appeal	★★★★
Playability	★★★★
Use of machine	★★★★
Value for money	★★★★



SPECTRUM

Pieces of eight

Name Smugglers Cove System
Spectrum 48K **Price** £6.95
Publisher Quicksilver, 0703 20169
Format Cassette **Outlets** Mail order, Sinclair dealers.

The year is 1753. Two miles off the north Cornish coast, huge waves pound the latest victim of the notorious Doombard, the cutter captained by the ruthless pirate Blackbeard. You are of course well aware of the rumours of the hidden hoard of Blackbeard's treasure, and the terrible tales of those who have tried to find it...

Objectives

But as well as tracking down the treasure, you have to find your way out of the maze of caves where the hoard lies hidden. And no, you can't get out the way you got in, because you have just slipped and fallen twenty feet to the floor of a cave.

In play

Getting started with this game is virtually impossible. You can get as far as finding five or six rooms, but you can't do anything once you have found them, unless you have gone through a complicated and unlikely sequence of actions, and all in the right order.

Without finding the whatshammycallit, as well as the other things, you can't climb the whersit. Unless you climb the whersit, you won't find the

doobrey. Without the doobrey, you can't cross the wheredidyou say to find the somethingorother. But to collect the somethingorother, you will need to have done something outlandish earlier with yetanotherobject in order to avoid being eaten by the whatsit.

The whole game is couched in eighteenth century Cornish-speak. 'Argh, Jim lad. There be a barrel here!' it growls at you. And it addresses you as 'Scupper' and 'Me lovely' as it tells you that it 'Can't do that.'

The graphics are nothing to write home about, but the pictures of the various locations are drawn fairly fast, and they're good enough to give you an idea of where you are.

Reincarnations are random, courtesy of a routine that asks you for your date of birth after you have been eaten/flattened/zapped by magic or whatever. More often than not, the program decided to leave me dead, so do be sure to save the game if you manage to get beyond first base with it!

Verdict

The first rule of adventure-writing has to be to lead the player on far enough to get him hooked before you start making things difficult for him. Getting anywhere at all with this game is just too hard, and there's only one solution to most of the problems: Sure, it will give you hours of happy fun — if you don't mind wandering round and round in circles. Just like life, in fact.

Shirley Fawcett

RATING

Lasting appeal	★★★★
Playability	★★★★
Use of machine	★★★★
Value for money	★★★★



Mike Gerrard and Steven McClure set up a two-man defence against the latest Sinclair hordes.

Sporting Spectrum

Spectrum games keep coming thick and fast — some of them more thick than fast, it must be said. But this latest consignment includes at least a couple that match arcade standards and even one in which it's your shout — you literally call the shots! Start yomping . . .

PHEENIX



Why should anyone write a fast-moving machine-code version of an

arcade classic, then make you wait 20 seconds between each and every game while the screen fills with stars? It's a pity because this is otherwise an enjoyable version of Phoenix . . . go on, admit it, you'd never have guessed.

You can use the keyboard or either Kempston or AGF joysticks, and select from five skill levels.

There are several screens of birds and eggs to be scrambled before you get to assault the Flagship. The hardest level is suicidal, but a few instructions wouldn't have gone amiss.

It is colourful, but due to the frustrating wait between each screen change I recommend you look for a better alternative.

AQUARIUS



Bug-Byte bites again with a game that would grace any arcade. Using

Kempston joystick or keyboard, you must negotiate your diver through a scrolling sea filled with sharks, jellyfish, mines, strangewood and other fishy nasties. Most of these can be despatched with a direct shot from your gun, but your oxygen is also expiring, so pick up the supplies from the seabed when you can.

If you're lucky, or extremely skilful, you'll eventually come to dark caverns, at the end of which is your mission — to defuse the death machines by shooting the three-colour coded panels in the sequence given at the start of the game.



Amusing graphics, if a little jerky here and there, but definitely the pick of this batch.

ANT ATTACK



After a hard day's gardening you fall asleep, but your dream turns nasty as

the ants decide to get their own back on you. At least that's the story behind what's claimed to be the first Spectrum game controlled partly by your voice.

Yell 'fire' at your tape recorder and that's what's meant to happen. I couldn't make it work, but that's not to say it won't on other tape recorders. More of a gimmick than of practical use, unless you can shout at a very fast rate indeed.

Settling for keyboard control, I enjoyed a fast and furious Centipede-type game, shooting at ants and other pests as they descend the screen in that well-known fashion.

The cassette insert is cheaply done, but there's nothing wrong with the game itself.

ALIEN INSECTS



Armed with a laser bolt, you must shoot down the fat little insects that

are buzzing all over the screen. You can move in four directions, with a sensible layout for keyboard control.

This is a game worth getting

just to see what sounds can be squeezed out of the Spectrum.

If you kill enough nasties then space eggs start to appear at the top of the screen, waiting to descend on you. By this time the insects are about as easy and pleasant to deal with as a swarm of wasps.

3D STRATEGY



As a change from killing ants, birds or jellyfish, here's a

game where you could cheerfully kill the programmer. It is so hard to beat the machine in this 4x4x4 version of Noughts and Crosses or Connect Four, and I was only playing on the easiest of the four skill levels.

The only drawback to this piece of software is the instructions. They drivel on for pages about how totally wonderful the game is . . . auto-play option, timer that can be set per move, per game or switched off, on-screen ticking clocks, two styles of play, an average response time of 1.7 seconds, machine code, over 200,000 decisions per move, and so on.

The board is displayed as four separate grids at the bottom of the screen, which is a little confusing, though I've no doubt a proper three-dimensional cube would have been even more so.

However, it does offer a very tough opponent, and it may be as good as it claims.

YOMP



A paratrooper opera which is fairly easy to figure out. You

use four keys to manoeuvre your way through four columns of trucks and tanks and all you have to do is learn how to place yourself in the optimum position to sneak through to the other side of the moving convoys.

As a video game memento of the Falklands conflict it's a pretty weak effort.

SHEEPWALK



Sheepwalk is almost as dull as Yomp once it's in play. You're

a sheepdog moving around the screen trying to catch up with miscreant sheep. While doing this you risk trampling the vegetables or bumping into walls.

GOLF



In its Virgin form, Golf is an interesting enough game to play. It requires

players to plot out each shot's direction and strength, while using the right club.

There's enough of a random element to make the game more than a little irritating. When your ball lands in the rough it can take three or four strokes to get it out. This is where having a low handicap (you can choose between 1 and 28) is a real advantage. The game's designers have assumed real duffers are going to have problems in getting out of the woods.

Phoenix (£5.50) — Megadodo Software, 16 White Road, Sutton Coldfield, West Midlands B72 1ND **Aquarius** (£5.95) — Bug-Byte, Mulberry House, Canning Place, Liverpool L1 8JB **Ant Attack**, **Alien Insects** — Macronics Systems, 26 Spiers Close, Knowle, Solihull, West Midlands B93 9ES **3D Strategy** (£6.95) — Quicksilver, 13 Palmerston Road, Southampton **Yomp** (£7.98), **Sheepwalk** (£7.98), **Golf** (£7.98) — Virgin Games, 61-63 Portobello Road, London W11 3DD.

WRITTEN ANY GOOD GAMES LATELY?

Have you asked Cascade
for a free evaluation — **WHY NOT?**

**WE
PAY**

ROYALTIES OR CASH

for games programs
written in basic/machine
code for most makes of micro.

This could be
YOUR BIG CHANCE.
You've nothing to lose.
Everything to gain.
Contact us NOW

**CASCADE
SOFTWARE**

CASCADES HOUSE
LLANDOGO
MONMOUTH
GWENT
S.WALES NP5 4PA

Evaluation form

Authors Name _____

Address _____

Computer _____

Game Name _____

Cassette enclosed ☐ YES ☐ NO

PCN 1/8

SEASIDE OFFERS FROM BLACKPOOL

**COMMODORE 64 £225 • LYNX £225
ORIC 1 48K £135 • SPECTRUM 48K £125
DRAGON + 3 GAMES £170 • BBC-B £399**

We stock Spectrum upgrades, Vic Ram
packs, Dragon Demons, Apple Snap-
shot, BBC joysticks, ZX-keyboards,
Texas leads, Atari disc cases, Oric
books.

We got it all

• GAMES • EDUCATION • BUSINESS • HARDWARE •

THIS MONTH'S SPECIALS:

APPLE • BILESTOAD MEDIEVAL COMBAT LOTS OF BLOOD £29.50
ATARI • CONSTELLATION. THE SKY AT NIGHT ON TV £6.99
ATARI • BLUE MAX. 3D WWI DOG FIGHT £24.95
BBC • DOG FIGHT. AERIAL WARFARE SHOOPY STYLE £8.65
COM 64 • JUMPMAN. MUSIC LADDERS CAVES £27.95
DRAGON • WORMTUBE. INTELLIGENT SCRAMBLE PLUS £6.99
IBM • ZORK I — THE CLASSIC ADVENTURE £30.99
LYNX • SULTAN'S MAZE. 3D MAZE CHASE £7.99
ORIC • INVADERS. LK'S TWIN TO XENON-I £7.99
SHARP • FROGGER ARCADE GAME ON Z80A OR K £9.95
SPECTRUM • KONG. PITS. 4 SCREEN ARCADE ACTION £5.95
TEXAS • ARTEC CHALLENGE. JUNIOR JUMPMAN £11.95
VIC-20 • KRAZY KONG. ANIROG SPECTACULAR £7.90
ZX-81 • TRADER. 3 PART ADVENTURE £9.95

HOME COMPUTERS
234 CHURCH ST,
BLACKPOOL FY1 3PX
TEL: 22340

"YOU ASK WE SUPPLY"

LANDAU ELECTRONICS

SPECIALISTS IN
HOME COMPUTERS

AQUARIUS • ATARI • COMMODORE
SORD • TEXAS INSTRUMENTS

COMPETITIVE PRICES
FULL RANGE OF
PERIPHERALS & ACCESSORIES

A HUGE RANGE OF

software

FOR THE ABOVE COMPUTERS PLUS
BBC, DRAGON, NEWBRAIN, ORIC

LANDAU ELECTRONICS

IN:

LIONHOUSE, 227 TOTTENHAM CT. RD.
LONDON, W1

TEL: 01-637 3024

AND AT: 215 HIGH ST., SUTTON, SURREY

TEL: 01-643 5494



DANGER ZONES

COMMODORE 64

Bolts from the blue

Name Matrix **System** Commodore 64 **Price** £8.50 **Publisher** Llamasoft, 49 Mount Pleasant, Tadley, Hants RG26 6BN **Format** Cassette **Language** Machine code **Other versions** Vic-20 **Outlets** Various dealers

If you thought Gridrunner was tough, Matrix, its successor, will make your hair curl. The screen teems with life and movement, and players run the risk of acquiring Gridders' Syndrome — cross-eyes, dislocated wrist and a king-sized inferiority complex.

Objectives

Flying your good ship *Gridrunner* around the grid, your task is to wipe out the invading Droids and Cosmic Cameldroids. Your ship can move in any direction and can fly anywhere on the grid, barring the top four lines.

There is a nasty little character called the Snitch to add to your miseries, as well as X and Y zappers which fire across and up the screen.

In play

The graphics and sound effects are excellent, the action as fast as you'll find without being near impossible. The title page allows you to choose your starting zone (1-6). Zones 1 and 2 have respectively one and two droids (caterpillar-like aliens) zooming across the grid. If hit, they split at the point of impact

and race off in opposite directions. Any droids reaching the bottom of the grid will start bouncing around like demented bees trapped in an empty jam-jar.

Zone 3 increases the tempo by sending in three droids and introduces the Snitch, a sort of boy scout gone bad. This tiny, unpleasant humanoid scuttles along the top of the grid, trying to win his Pathfinder badge by tracking your movements.

Zone 4 adds miniature camels (the author must have been bitten by one as a baby!) to the fleet. Zone 5 brings on the Deflexor, a large, centrally-placed shield which changes shape each time its hit. Beware ricochets! Zone 6 has the aliens getting serious by dropping bombs.

Thereafter, the action gets wilder and your eyes wider. The aliens start attacking in a variety of combinations, formations and movements.

There were a couple of mistakes on the cassette insert I had. To select the level, press F1 (not 'any key') and to freeze and unfreeze the action, press the Commodore logo key and any key respectively.

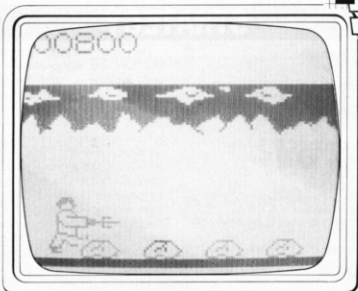
Verdict

Matrix is a high-quality all-action arcade game. It has originality and variety, combined with stunning speed, good graphics, sound and colour. Highly recommended.

Bob Chappell

RATING

Lasting appeal	★★★★
Playability	★★★★
Use of machine	★★★★
Overall value	★★★★



DRAGON 32

Great balls of fire

Name Ninja Warrior **System** Dragon 32 **Price** £8.95 **Publisher** Programmers Guild (UK) Ltd, Ahed House, Sandbeds Industrial Estate, Ossett, W Yorks. (0924) 278181 **Format** Cassette **Language** Machine code **Other versions** Tandy Colour Computer **Outlets** Mail order

Ninja Warrior might sound like an adventure game, but it's a graphics challenge that involves moving your man across a scrolling landscape while he kicks rocks and jumps over other assorted items.

Objectives

Points are what you're after as you travel as far as possible through several screens demanding increasingly difficult manoeuvres. Success at the first screen makes you a white belt, the second one a yellow belt, and so on.

In play

Your first choice is between keyboard or joystick control, the keyboard using 'K' for jump and 'O' for Kick. The joystick fire button causes your warrior to jump in Donkey Kong fashion, and moving the stick forward makes him kick out at whatever's in his way. You state the number of players, from one to six.

Judging by the graphics, if I didn't know the program was in machine code I would have put money on it being a Basic program — the movements were rather jerky in places and

the animation of a fairly simple matchstick standard.

The first stage offers you a series of rocks to kick. You can jump as well, but it's possible to leap only a single rock and here they're mostly in groups of three or four.

Become a white belt and you move to yellow-belt level, which involves more rocks, but now with occasional gaps in the ground and fireballs too to leap over. This is where the game gets tricky, with rocks and fireballs placed so close together at times that it seemed impossible to deal with them, though maybe I lack agility.

I did get through eventually, and moved on to second-level yellow belt. Subsequent stages obviously add more hazards for you to deal with... falling fireballs and arrows, to either kick or catch.

One nuisance is having to go right back to the beginning every time you fail, though thankfully not each time you lose one of your three lives, with bonus lives coming at 10,000 points.

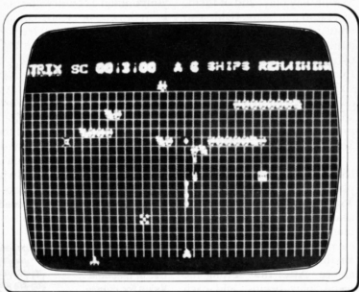
The sound effects are the best part of the program, beginning with a door creaking open as the title page shimmers onto the screen, and a rather effective rock-smashing explosion.

Verdict

A disappointing game, and hardly recommended. 'A totally awesome experience in arcade action'? Perhaps a few years ago, yes — but have you visited the arcades lately, Programmers Guild? **Mike Gerrard**

RATING

Lasting appeal	★★
Playability	★★
Use of machine	★★
Overall value	★★



STRATEGY

ORIC

The spoils of oil

Name Dallas System 48K Oric Price £6
Publisher Caves Computer Simulations, 14 Langton Way, London SE3 7TL 01-858 0763
Format Cassette **Other versions** Spectrum **Outlets** Mail order, Oric dealers.

Even the most dedicated Dallas fan is not likely to stay glued to the TV set when his or her Oric is screening this version of the programme. The menace of JR is somehow lost when all you get is the odd typed mention of him.

Objectives

The object of each episode is to make enough money drilling oil to be able to fight off Euing (or at least that's the way the game spells it) Associates and eventually take it over.

Money is made by investing in oil wells and then developing them.

In play

In the best tradition of the TV soap opera, this is largely a rehash of an old theme, with just a dash of something new. The old theme is that of the 'Kingdom' game; you have to manage resources wisely — don't go too mad and don't be too miserly.

A touch of new is a map showing little graphics which indicate the current state of each oil well.

They start as empty plots of land and are developed into wells, refineries and finally pipelines. All the time their production value is rising, unless of course God or the government should choose to interfere.

Most of the game is spent keying-in two letters (although the program insists on calling them numbers) which give the co-ordinates of each well on the map. These say which well is to be moved/drilled/developed/piped.

The cost of doing each of these is subtracted from the company balance sheet shown on the right hand side of the screen. Profits are added to it.

If the finances are handled badly or lots of dry wells are dug, good old JR sends a Telex saying he is taking over your company.

If you do well you get to send him one.

Verdict

Gone is the double dealing and corruption we used to know in Dallas.

I pressed a few odd keys to see what they do. Some land you back in the middle of a huge Basic program, others muck up the screen display, a few cost money and sometimes you even get to cheat.

The viewing figures for this version of the TV series are likely to plummet after the first few episodes.

Margaret Keenan

RATING

Lasting appeal
Playability
Use of machine
Value for money



IBM PC

War and PCs

Name Call to Arms System IBM PC, 64K and one disk drive, colour graphics card Price £24.78
Publisher Sirius Software, Sacramento, California **Format** Diskette **Outlets** Softsel, Central Way, N Feltham Trading Estate, Feltham, Middlesex, 01-844 2040.

So you thought IBM was taking over the world? Well, Call to Arms provides a new variation on this — you get to take over the world with your IBM. Well, not the whole world, you understand — just Europe. Or even Scotland, if you prefer. Either way, this is a game where you can let your delusions of grandeur run riot.

Objectives

This game is Risk, as near as makes very little difference. Up to four may play, and of them, up to four can be the IBM — so you can just sit back and watch it battle it out, if you prefer. The playing board is either a map of Europe in 1942, or of the countries of Scotland in the eighteenth century — do we spot an expatriate Scottish programmer lurking in Sirius Software's California HQ?

As in the board game, countries are shared out among the players at the outset. There are 36 of them, so everyone gets fair shares. Then you decide how many armies are to be placed in each country for kick-off — anything between two and nine apiece. After thus setting the scene, play begins, and each

player in turn reinforces the countries he or she — or it, in the IBM's case — controls, or attacks neighbouring states.

The winner of each battle is decided randomly, until the attacker decides discretion is the better part of valour or until one force is wiped out. Then the victor must occupy the defeated country with one or more armies, and has the option of doing it all over again, on some other front.

In play

Despite the fact that the IBM has the advantage, since it decides the outcome of each battle, it does play fair. Twice in my first game it made the sad mistake of pitting 13 armies against my three and losing.

Playing this game is none too easy, since to pick the country you want to reinforce, attack or attack from you must move the cursor onto that country. But doing so takes half an eternity, since all four cursor control keys simply step you through the same sequence of countries in the same order. Each time you conquer a country, the map is redrawn in your colours rather slowly. You just have to sit and wait it out.

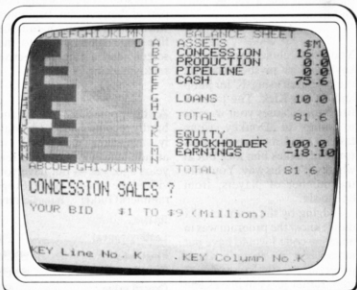
Verdict

There's a certain 'War Games' fascination in watching Europe — or Scotland — change colour before your very eyes. And the game is well implemented, though the instructions could be clearer. If you like — and win at — Risk, you'll like this too.

Shirley Fawcett

RATING

Lasting appeal
Playability
Use of machine
Value for money



PROCOM SOFTWARE... WHERE THE FUN BEGINS.

IT WILL
DRIVE YOU...

BONKERS

**2 New
Releases for
September**

BOTH GAMES
FOR ONLY

£5.50
EACH

BONKERS

It will drive you round the bend. Play this game and you will find your sanity slowly drift away. It's a frustrating game of high resolution graphics—crazy sound effects and fast machine code with many difficulty levels. Only if you complete all levels can you hope to restore some sanity!

For any ZX Spectrum



It will
Drive
You...

BONKERS



GRID MASTER



GRID MASTER

Surely one of the most intriguing board games on the micro. The computer learns your tactics as you play. You will beat it a few times but once your Spectrum has mastered the game it will probably beat you every time. At the end of the game an assessment is made of your skill, displayed on a chart.

For your 48k Spectrum

PROCOM SOFTWARE
309 High Road,
Loughton,
Essex.
Tel: 01-508 1216

Available from all good stockists

PCN ProgramCards

This week in ProgramCards there are three new programs and the conclusion of the Atlas program for the Lynx 48K.

The Spectrum program will be useful to anyone studying statistics. This bar chart routine from David J Leart, of Washington, Tyne and Wear, displays statistical data in a very clear way. Be careful, when using this program, that the frequencies entered are not too varied. If the difference between the first frequency and the last frequency is too great then the smallest will not be displayed properly.

Many keysetting programs have been published for the BBC, and by now most users will have their own favourite settings.

However, the Keyset program from Alistair McLeod, of Glasgow, displays, on the bottom line of the mode 7 screen, the function of each key. This program has an advantage over the old method of sliding a new function key label under the perspex panel. It can be saved and loaded with the appropriate program.

They key settings that come with the

program are set up for program editing and tape disk copying. Obviously, you can alter the keys to suit your own requirements. Note that the keys and their settings can be loaded and saved by using
*SAVE CEYS BOO CFF BOO
*LOAD CEYS BOO

Asteroid Lander is a version of the famous lunar lander game, for the Dragon 32, from R Woodward Clarke, of Sutton Coldfield. This version is a little more advanced than most as it uses the Dragon's colours and sound rather well. It also holds the name and number of points of the highest scoring player.

In theory it is possible to make the game run even faster by using the speed-up poke: 1870 POKE &HFFD7,0

Unfortunately this caused our machine to crash. The normal speed pokes (&HFFD6,0) were left in so try it and see.

The pilot has the option of keyboard or joystick for control. The keyboard uses the cursor control keys ←, → and ↓. The down arrow is used for thrust. When changing

between arrows release the arrow you were pressing before pressing the next otherwise the last command is repeated.

A RUN for our money

We pay for published programs on a sliding scale which take into account length, complexity, originality and the programming skill demonstrated in the program. So why not give us a RUN for our money?

As well as the cash, you receive the satisfaction of seeing your byline on the ProgramCard — which will, of course, be snipped out and filed away in the libraries of thousands of micro enthusiasts throughout the country.

Send your contribution, on disk or cassette, together with a plain paper listing and brief summary notes to:

The Programs Editor, *Personal Computer News*, VNU, 62 Oxford Street, London W1A 2HG.

All disks and cassettes will be returned as soon as possible after evaluation or publication, at our expense.

PCN ProgramCards

Asteroid Lander Card 1 of 7

8326AL1/7

```
40 CLEAR 1000
60 CLS 0
130 PRINT#403,"press";PRINT#409,"any";
PRINT#493,"key";PRINT#497,"for";PRINT#
501,"the";PRINT#505,"game";
140 POKE1462,45
150 POKE1495,49;POKE1494,57;POKE1495,56;
POKE1496,51
160 POKE1506,40;POKE1533,41
170 SCREEN 0,1
180 IF INKEY="" THEN 180
190 REM INSTRUCTIONS INPUT PAGE
200 CLS
205 PRINT"JOYSTICK (Y/N)";INPUT IN#
206 IF IN#="N" THEN JOH=1 ELSE JOH=0
210 PRINT#229,"INSTRUCTIONS (Y/N)";INPUT
T IN#
220 IF IN#="Y" OR IN#="YES" OR IN#="N" OR
R IN#="NO" THEN 230 ELSE 200
230 IF IN#="Y" OR IN#="YES" THEN 250 ELSE
E 800
240 REM PAGES OF INSTRUCTIONS
250 CLS
260 SOUND240,1
270 PRINT#67,"*****the game*****"
280 PRINT#61,"IS TO SAFELY LAND YOUR R
OCKET ON THE LANDING PAD AS MANY
TIMES AS YOU CAN IN THE SHOR
EST TIME YOU CAN"
290 PRINT#306,"***PRESS ANY KEY FOR MORE
***"
300 IF INKEY="" THEN 300
310 CLS
```

Dragon 32 Dragon Basic

Application: Game
Author: R Woodward Clarke

```
320 SOUND240,1
330 PRINT#73,"***detail***"
340 PRINT#160,"YOU HAVE 3 LIVES."
YOU SET THE INITIAL SPEED AND TH
E AMOUNT BY WHICH THE SPEED IS INCR
EASED AFTER EACH SUCCESSFUL LAND
ING"
350 PRINT#410,"***PRESS ANY KEY FOR MORE
***"
360 IF INKEY="" THEN 360
370 CLS
380 SOUND240,1
390 PRINT#72,"***controls***"
400 PRINT#161,"YOU STEER YOUR ROCKET WI
H THE RIGHT AND LEFT CURSOR
CONTROLS AND ACTIVATE THE RET
RO ROCKETS WITH THE CURSOR DOWN KEY"
410 PRINT#206,"***PRESS ANY KEY FOR MORE
***"
420 IF INKEY="" THEN 420
490 CLS
500 SOUND240,1
510 PRINT#65,"***control of retro-rocket
***"
520 PRINT#163,"WHILE YOUR FIRE BUTTON IS
DEPRESSED YOUR VELOCITY IS S
LOWLY DECREASED UNTIL IT IS ZERO,R
ELEASE THE BUTTON TO CUT THE RETROS
AND RESUME MAXIMUM VELOCITY"
530 PRINT#450,"***PRESS ANY KEY FOR MORE
***"
540 IF INKEY="" THEN 540
```

40 Reserve 1,000 bytes for
variables etc.
60 Clear screen

130-230

240-540

Option of joystick and
instructions
Instructions (may be omitted if
desired)

YEP FOLKS — IT'S HERE

AVAILABLE NOW
Spectrum 48K
Dragon
Com 64

CALIFORNIA

GOLD RUSH

HOWDO PARDNERS

This here's Prospector Jake, I sure am havin' one helluva time tryin' to peg ma claim with those damned injuns a hollerin' an' a hollerin' all over this territory. Ma job gets harder as I move from one Gold Field to another. I know, that is me an' ma stubborn horny of Mule here know of 24 rich an' I mean rich seams of pure Gold. All it needs to make this here of critter happy is that you help me peg every doggone last one of them claims.

Can YOU help Jake become rich, help him peg his claim, dodge the arrows, avoid the tomahawks, and plant the Dynamite in just the right place? ... YOU CAN!!!

YIPPEE ... Git yer Picks an' Shovels and join the CALIFORNIA GOLD RUSH ... NOW

Amazing Arcade Action ... Stunning Sound and Graphics Available NOW for Commodore 64, Spectrum 48, and Dragon

£7.95 including P&P

SPECIAL OFFER **SPECIAL OFFER** **SPECIAL OFFER**

Order CALIFORNIA GOLD RUSH before September 5 and get a 10-game Cassette of terrific games ... **FREE**

COMING SOON

LEAPIN' LANCELOT: Medieval Machine Magic to enthral you GALACTIC SURVIVAL PAK: Every Astro-Traveler must have this!



We always need Dynamic Dealers and imaginative Writers

Please rush me CDR £7.95 (incl)

TOTAL SUM INCLUDED £
Please send cheque and PO
payable to
ANIK MICROSYSTEMS,
30 KINGS CROFT COURT,
BELLINGHAM, NORTHAMPTON

Name _____

Address _____

AVAILABLE NOW



for ZX81 16K
Spectrum 48K
Dragon
Commodore 64

PURCHASE LEDGER ... handles up to 100 accounts, invoices, payments, VAT handling and analysis. Selectable print options.

SALES LEDGER ... spec. as Purchase Ledger.

COMBINED DATABASE ... fully definable, vast spreadsheet storage, rapid calculations. Terrific value.

MICROLYMPICS 1 ... each containing 10 action **MICROLYMPICS 2** ... games. Selection of standards (Pac-Man, etc.), plus new amazing games.

ALL TAPES COME WITH FREE BACK-UP TAPE IN PRESENTATION BOX

SINCLAIR ZX81. 16K	SPECTRUM 48K	COM. 64 DRAGON £12.95
£9.95		

Please rush me

TOTAL SUM INCLUDED: £
Please make cheques and PO payable to
ANIK MICROSYSTEMS,
30 KINGS CROFT COURT
BELLINGHAM, NORTHAMPTON

Name _____

Address _____

Computers by Post

ALL OUR PRICES INCLUDE VAT!

BBC

Model B £395
Disk Interface Kit £82
Comman 100 Disk Drive £215

Oric1

48K £129
Inc Software

Commodore

VIC-20 Package £134
1520 Printer £319
10H Ram Pack £29
CRN Cassette £39
Commodore 64 £199
1541 Disk Drive £219

Jupiter

ACE £69

Atari

400 16K inc BASIC £129
800 48K inc BASIC £215
800 48K inc BASIC £269
410 Cassette Deck £47
810 Disk Drive £279
850 RS 232 Interface £130

Delivery by Securicor FREE Delivery and Packing. Send off the coupon or order by phone quoting your Access/ Barclaycard No. Phone 01-549 8229. Immediate despatch on receipt of order or cheque clearance.

GALASET LTD

30 Bayford Road,
Littlehampton, West Sussex.
Tel: 01-549 8229

Sinclair

Spectrum 16K £96
Spectrum 48K £125
ZX81 £38
ZX Printer £38
16K Ram Pack £28

Epson

HX20 Portable £429
Micro Cassette Drive £80
Expansion Unit £89

New Brain

Model A £259
Model RD £285

Dragon

32K £159

Printers

EPSON RX80 £289
EPSON FX80 £419
RS 232 Interface £68
Seikosha GP 100 A £199
Commodore Seikosha GP 250 X £215
Oric Printer/Plotter £249
Star DP510 £159
Star DP515 £269
Shinwa CP80 £369
Juki Daisy Wheel £289
Smith-Corona Daisy Wheel £399
£479

Printers/ Typewriters

Olivetti Byewriter (Parallel) £489
Silver Reed EX44 (RS 232) £489

To: Galaset Ltd, 30 Bayford Road,
Littlehampton, West Sussex.

Please supply

I enclose my cheque for £
(FREE delivery and packing)

or charge my Access/Barclaycard No.

Name _____

Address _____



PCN 1/9

Signature _____

Asteroid Lander Card 2 of 7

8326AL/7

```

670 CLS
680 SOUND240,1
690 PRINT@73,"****scoring****"
700 PRINT@164,"A HIGH SCORE FACILITY IS
    INCLUDED.THE HIGH SCORE SCREEN IS D
    ISPLAYED BEFORE A NEW GAME. TO MOVE ON T
    O A NEW GAME PRESS          ANY KEY"
710 PRINT@418,"***PRESS ANY KEY FOR MORE
    ***"
720 IF INKEY$="" THEN 720
730 CLS
740 SOUND240,1
750 PRINT@70,"****screen*display****"
760 PRINT@164,"AT THE BOTTOM IS THE PAD
    ON THE ICE COVERED ASTEROID. AT
    THE TOP IS THE ROCKET, THE NUMBER
    OF LIVES LEFT & THE MAXIMUM & PRESEN
    T VELOCITY"
770 PRINT@418,"***PRESS ANY KEY TO START
    ***"
780 IF INKEY$="" THEN 780
790 REM GOOD LUCK PAGE
800 CL=RND(9)-1
810 PLAY"01"
820 FOR J=462 TO 1 STEP-33
830 CLS CL
840 PRINT@J,"GOOD LUCK!!!!..";
850 SCREEN 0,1
860 PL=PL+5

```

```

870 IF PL>12 THEN PLAY"D+"
880 IF PL>12 THEN PL=1
890 PLAY"15;V20;"+STR$(PL)
900 NEXT J
910 FOR J=1 TO 400:NEXT J
920 REM SETTING UP VARIABLES
930 HS=1000
940 HS$="THE COMPUTER"
950 DIM R (9,15)
960 DIM NR (9,21)
970 DIM RR (9,7)
980 DIM PAD (16,21)
990 A$="BM+2,+0;U5E2F2D2L4R4D3"
1000 C$="BM+2,+0;H1U5E1R2F1BD5G1L2BR3"
1010 D$="BM+2,+0;R1U7L1R3F1D5G1L2BR3"
1020 E$="BM+6,+0;L4U4R3L3U3R4BD7"
1030 H$="BM+2,+0;U7D3R4U3D7"
1040 I$="BM+2,+0;R2L1U7L1R2BD7"
1050 L$="BM+2,+0;U7D7R4"
1060 N$="BM+2,0;U7D1F4U5D7"
1070 O$="BM+2,+0;U7R4D7L4R4"
1080 P$="U7R3F1D2G1L3BR4BD3"
1090 R$="BM+2,+0;U7R3F1D2G1L3R2F1D1F1"
1100 S$="BM+2,-1;F1R2E1U2H1L2H1U1E1R2F1B
    D6"
1110 T$="BM+4,+0;U7L2R4BD7"
1120 V$="BM+3,-7;D5F2E2U5BD7"
1130 Y$="BM+2,-7;D2F2D3U3E2U2BD7"
1140 L1$="BM+0,-4;E1R1D5L2R4"

```

670-780 Continue instructions
790-910 Game start with a 'good luck' message

920-1140 Set up variables and graphics strings

Asteroid Lander Card 3 of 7

8326AL3/7

```

1150 L2$="BM+0,-4;E1R3F1D1G1L3G1D1R5"
1160 L3$="BM+0,-4;E1R3F1G1L1R1F1D1G1L3H1"
1170 B=0
1180 TI=0
1280 REM INPUT SPEED SETTINGS PAGE
1290 IF SK=2 THEN SOUND 150,3 ELSE SOUND
    50,3
1300 CLS
1310 PRINT@133,"SELECT SPEED 1-20":INPU
    T S
1320 IF S<1 OR S>20 THEN 1300
1330 SOUND S*12,2
1340 PRINT@269,"SELECT SPEED INCREASE 1-
    10":INPUT V
1350 IF V<1 OR V>10 THEN 1300
1360 SOUND V*12,2
1370 FOR J=1 TO 500:NEXT J
1380 REM PLEASE WAIT PAGE
1390 CLS RND(9)-1
1400 PRINT@232,"**please*wait**";
1410 PRINT@200,"*****";
1420 PRINT@264,"*****";
1430 SCREEN 0,1
1440 REM SKIP FORWARD IF ALREADY DEFINED
1450 IF NN=1 THEN 1610
1460 REM DEFINE ROCKET ETC.
1470 PMODE 4:PCLS
1480 DRAW"S4;BM2,14;U1E2F2D1U1H2U1R2U7F2

```

```

D3L2U6H2G2D6L2U3E2D7R2"
1490 GET(0,0)-(8,14),R,G
1500 PCLS
1510 DRAW"S4;C5;BM0,6;E2;U2;BM8,6;H2;U2;
    BM4,0;D5;F1;H1;G1"
1520 GET(0,0)-(8,6),RR,G
1530 PCLS
1540 GET(0,0)-(8,20),NR,G
1550 PCLS
1560 DRAW"BM0,0;R2D1L5D2L1R2L1U2L1R5D2
    R1L2D1L4D11R20U1L1S"
1570 DRAW"S4;BM2,13;"+P$+A$+D$
1580 GET(0,0)-(20,15),PAD,G
1590 NN=1
1600 REM SET UP SCREEN & SCREEN VARIABLE
    S
1610 THR=0
1620 IF LIVES=0 THEN LIVES=3
1630 X=RND(241)+4;Y=15
1640 PMODE4,1:PCLS
1650 FOR ST=1 TO 100
1660 PSET(RND(253)+1,RND(170)+15,5)
1670 NEXT ST
1680 CIRCLE(RND(50)+100,191),200,5,.12,
    .5,0
1690 PAINT(125,190),5,5
1700 PP=RND(232)+1
1710 IF PP>105 AND PP<130 THEN 1700
1720 PUT(PP,161)-(PP+20,176),PAD,PSET

```

1150-1180 More strings and variables
1280-1370 Select speed settings. The
lower numbers are easier
1380-1420 Display 'wait' message while

1460-1590 graphics are defined
Proceed with the definitions, if
required
1600-1720 Start of screen set-up

BBC Microcomputer System

OFFICIAL BBC COMPUTER DEALER

MODEL A AVAILABLE £299 inc. VAT

This is the best microcomputer currently on the market. 32K RAM, 32K ROM, 8 modes of operation, full colour, full-size keyboard, internal expansion such as disc interface, speech synthesizer, Centronic interface - in short, it is a personal computer capable of expanding into a small business system.

BBC Microcomputer Model B	£349	VAT	£399.80
BBC Model B - disk interface	£409	VAT	£459.80
BBC Model B - Centric interface	£389	VAT	£439.80
BBC Model B - disk and Centric interfaces	£439	VAT	£489.80
BBC 100K disk drive	£229	VAT	£279.80
BBC dual 800K disk drive	£399	VAT	£449.80
Torch Z80 disk pack including Z80 2nd processor, 64K RAM and CPU operating system	£109	VAT	£159.80
BBC Teletext receiver (Augs)	£229	VAT	£279.80
BBC cassette reader and writer	£26	VAT	£31.60
Disk interface kit (free fitting)	£85	VAT	£90.60
Mod A to Mod B upgrade kit	£30	VAT	£35.60
Fitting charge for A to B upgrade kit	£20	VAT	£25.60
16M memory upgrade kit	£229	VAT	£279.80
Games paddle	£11	VAT	£16.60
12" Monochrome monitor incl. cable	£89	VAT	£139.80
16" Colour monitor incl. cable	£229	VAT	£279.80
Use guide	£10	VAT	£15.60
Centric interface (free fitting)	£80	VAT	£85.60
Speech interface (free fitting)	£47	VAT	£52.60
BBC disk manual - formatting disk	£30	VAT	£35.60
Parallel printer cable	£10	VAT	£15.60
BBC 400K processor level	£32	VAT	£37.60
BBC Fourth language cassette	£15	VAT	£20.60
BBC 100K language cassette	£15	VAT	£20.60

100% BBC COMPATIBLE MITSUBISHI AND TAC SLIMLINE DISK DRIVES



These drives are supplied ready cased with all the necessary cables, formatting program and user disk system guide.

There are some useful utilities included, e.g. Epson Screen Dump Program, Memory Dump, Free, Duplicate, Merge and Reformat. Power consumption of these drives is very low (0.2A to 0.4A at 12V, 0.4V to 0.5V per drive). Power is taken from the BBC computer.

Single drive 100K 40 tracks £179 | VAT | £229.80 |

Dual drive 200K 40 tracks £239 | VAT | £289.80 |

Single drive 400K 80 tracks £249 | VAT | £299.80 |

Dual drive 800K 40 tracks switchable £449 | VAT | £499.80 |

Dual drive 800K 80 tracks switchable £489 | VAT | £539.80 |

* COMPLETE TOOL PROCESSOR FOR ONLY £1,099 + VAT *

This package consists of BBC Microcomputer, View, word processor, 400K Simone disc drive, high resolution 12" Green monitor, Jui 6100 18CPS Daisy Wheel printer and all the necessary cables and documentation. The above package can be supplied with components of your own choice, e.g. 800K disc drive or a different printer. Please phone us for a price for your particular requirement.

Special package incl. £1,099 - VAT - £1,263.80

PROFESSIONAL MONITORS

12" Green monitors with composite and sync. input. Suitable for most computers.	£89	VAT	£139.80
15" 1MHz band with high resolution.	£129	VAT	£179.80
15" 1MHz band with normal resolution.	£89	VAT	£139.80
COLOUR MONITORS			
* MICROVITE RGB input 14" monitor supplied with RGB lead to BBC	£229	VAT	£279.80
* SANYO SC141 "Normal res. 14" 400 dots, RGB input supplied with RGB lead	£219	VAT	£269.80
* SANYO SC141M "Medium res. 14" 600 dots, RGB input supplied with RGB lead	£299	VAT	£349.80
* SANYO SC141H "High res. 14" 800 dots, RGB input supplied with RGB lead	£449	VAT	£499.80

GREEN MONITORS			
12" Green screen monitors with composite and sync. input. Suitable for most computers.	£89	VAT	£139.80
15" 1MHz band with high resolution.	£129	VAT	£179.80
15" 1MHz band with normal resolution.	£89	VAT	£139.80
COLOUR MONITORS			
* MICROVITE RGB input 14" monitor supplied with RGB lead to BBC	£229	VAT	£279.80
* SANYO SC141 "Normal res. 14" 400 dots, RGB input supplied with RGB lead	£219	VAT	£269.80
* SANYO SC141M "Medium res. 14" 600 dots, RGB input supplied with RGB lead	£299	VAT	£349.80
* SANYO SC141H "High res. 14" 800 dots, RGB input supplied with RGB lead	£449	VAT	£499.80

EPSON FOR RELIABILITY

EPSON FX80 80 column, 160 CPS, normal, italic and elite characters, 256 user definable characters, superscript, subscript, 11 x 9 matrix, bi-directional logic seeking, hi-res bit image printing (160 x 8 dots/inch), friction and printlet, 1 international character sets, Centronic parallel interface.

EPSON FX80 80 column, 160 CPS, normal, italic and elite characters, 256 user definable characters, superscript, subscript, 11 x 9 matrix, bi-directional logic seeking, hi-res bit image printing (160 x 8 dots/inch), friction and printlet, 1 international character sets, Centronic parallel interface.

EPSON RX80 80 column, 100 CPS, normal, italic and elite characters, 192 international character sets, hi-res bit image printing, bi-directional logic seeking, 4" to 10" adjustable pin feed, Centronic parallel interface.

EPSON RX80 80 column, 100 CPS, normal, italic and elite characters, 192 international character sets, hi-res bit image printing, bi-directional logic seeking, 4" to 10" adjustable pin feed, Centronic parallel interface.

MX-100 136 column, 10 CPS, friction and traction feed, up to 15" adjustable carriage, hi-res bit image printing, true descenders, Centronic parallel interface.

MX-100 136 column, 10 CPS, friction and traction feed, up to 15" adjustable carriage, hi-res bit image printing, true descenders, Centronic parallel interface.

RS232C interface for all above printers

Intelligent IEEE 488 interface.

Tractor feed for FX80.

Roller holder for FX80.

Ribbon for MX80, FX80, RX80.

Ribbon for MX100.

£379 - VAT - £429.80

£299 - VAT - £349.80

£339 - VAT - £389.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

£379 - VAT - £429.80

TEXAS INSTRUMENTS TI 99/4A

This microcomputer is based on TMS9901 16-bit microprocessor. It includes 16K RAM, 16 colour high resolution graphics (1920 x 256). The screen display is 32 characters, 24 lines 11-BASIC. Full-size keyboard. For Software there are about 1000 programs to choose from. There are a lot of peripherals available, e.g. Disk Drives, Disk Interface, Speech Synthesizer, Extra RAM, Additional Language (PASCAL, TI-LOGO, ASSEMBLER).

TI 99/4A Complete with 16K RAM and power supply

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

£149.95

Akhter Instruments Limited
DEPT. PCN, EXECUTIVE HOUSE, SOUTH RD.,
TEMPLEFIELDS, HARLOW, ESSEX CM20 2BZ, UK.
TEL: HARLOW (0279) 443521 OR 412639
TELEX 959801 REF - A18

ORDERING INFORMATION

All orders which accompany a cheque, cash or postal orders are CARRIED FREE (UK only). Please make cheques and postal orders payable to AKHTER INSTRUMENTS. A carriage charge of 3% of invoice total is applicable to BARCLAYCARD and ACCESS orders. We accept official orders from Government and Educational establishments. We accept VAT FREE EXPORT orders. Please phone or write to check shipping costs.

OPENING HOURS: MON-FRI 9am-5.30pm, SAT 10am-2pm.

We welcome callers, no parking problems.

Euro Atlas

Card 3 of 6

Lynx/Lynx Basic/Wood/Continued

8326EA36

```

1110 DATA 86,138,74,134,68,138,68,147
1120 DATA 55,150,46,142,20,136,26,126
1130 DATA 30,98,22,90,24,84,2,74
1140 DATA 4,72,4,68,0,70,2,66
1150 DATA 8,66,12,64,16,64,18,68
1160 DATA 28,66,28,60,26,54,32,54
1170 DATA 34,57,45,56,43,54,56,47
1180 DATA 55,38,63,35,77,48,110,60
1190 DATA 103,82,94,99,100,95,103,112
1200 DATA 98,114,103,116,102,123,108,126
1210 VDU 1,2
1220 PRINT @ 0,210;"Do you require more
information? Y/N "
1230 IF GETN=78 THEN GOTO 1400
1240 VDU 1,2
1250 FOR V=1 TO 8
1260 READ U,I
1270 MOVE U,I
1280 DRAW 120,10+(V*10)
1281 BEEP 200,10,65000
1285 NEXT V
1290 DATA 44,55,50,57,62,64,26,84
1300 DATA 33,116,84,84,52,135,88,137
1320 WINDOW 61,123,16,245
1330 VDU 23,1,1
1340 FOR N=1 TO 8
1350 READ N#
1360 PRINT N#
1370 NEXT N
1380 DATA 1.LE HAVRE,2.ROUEN,3.PARIS,4.NANTES

```

```

1390 DATA 5.BORDEAUX,6.DIJON,7.TOULOUSE,
8.MARSEILLES
1395 VDU 1,2
1400 PRINT @ 0,210;"Do you require anot
her country? Y/N"
1410 IF GETN=78 THEN GOTO 10000
1420 GOTO 50
2000 CLS
2010 VDU 1,2
2020 PRINT @ 61,0;"SPAIN & PORTUGAL"
2030 PRINT @ 61,10;"-----"
2040 VDU 1,4
2050 MOVE 12,76
2060 RESTORE 2090
2070 FOR Z=1 TO 71
2080 READ A,B
2090 DRAW A,B
2100 BEEP 400,10,65000
2110 NEXT Z
2120 DATA 18,74,18,76,16,78,25,79
2130 DATA 27,77,31,78,32,81,34,82
2140 DATA 28,88,28,94,25,95,25,97
2150 DATA 27,98,26,102,22,103,25,109
2160 DATA 24,113,23,111,22,115,25,117
2170 DATA 25,120,20,123,20,128,7,130
2180 DATA 10,114,6,114,7,111,4,112
2190 DATA 5,104,8,103,13,85,12,74
2200 DATA 15,73,11,63,18,60,20,61

```

1110-1420 Same as Great Britain but for France

2000-2530 Spain and Portugal

Euro Atlas

Card 4 of 6

8326EA46

```

2210 DATA 19,58,25,56,26,59,60,63
2220 DATA 62,62,65,64,70,63,73,63
2230 DATA 73,65,87,69,89,66,94,68
2240 DATA 95,72,108,71,108,77,102,83
2250 DATA 93,86,90,90,92,91,89,95
2260 DATA 88,93,82,105,86,113,80,117
2270 DATA 78,126,69,128,60,135,47,135
2280 DATA 44,138,40,136,37,141,34,143
2290 DATA 31,141,24,129,20,128
2291 MOVE 103,103
2292 FOR D=1 TO 4
2293 READ A,B
2294 DRAW A,B
2295 BEEP 400,10,65000
2296 NEXT D
2297 DATA 109,99,113,101,110,105,103,103
2300 VDU 1,2
2310 PRINT @ 0,210;"Do you require more
information? Y/N "
2320 IF GETN=78 THEN GOTO 2510
2330 FOR V=1 TO 10
2340 READ U,I
2350 MOVE U,I
2360 DRAW 120,10+(V*10)
2370 BEEP 200,10,65000
2380 NEXT V
2390 DATA 11,63,60,63,15,85,7,111,53,95
2400 DATA 102,83,32,127,82,105,114,102,3
7,141
2410 WINDOW 61,123,16,245
2420 VDU 23,1,1

```

```

2430 RESTORE 2480
2440 FOR N=1 TO 10
2450 READ N#
2460 PRINT N#
2470 NEXT N
2480 DATA 1.CORUNNA,2.BILBAD,3.OPORTO(Po
rtugal)
2490 DATA 4.LISBON(Portugal),5.MADRID,6.
BARCELONA
2500 DATA 7.SEVILLE,8.VALENCIA,9.MAJORCA
,10.GIBRALTAR
2505 VDU 1,2
2510 PRINT @ 0,210;"Do you require anot
her country? Y/N"
2520 IF GETN=78 THEN GOTO 10000
2530 GOTO 50
3000 VDU 1,2
3010 CLS
3020 PRINT @ 61,0;"E.&W.GERMANY&DENMARK"
"
3030 PRINT @ 61,10;"-----"
"
3040 VDU 1,4
3050 MOVE 80,160
3055 RESTORE 3110
3060 FOR Z=1 TO 79
3070 READ A,B
3080 DRAW A,B
3090 BEEP 400,10,65000
3100 NEXT Z

```

3000-3550 East & West Germany and Denmark

sinclair **special**

3



Inside...

***The New ZX Microdrive!
Latest software...
Latest prices...***

The ZX Microdrive- and more!

For some time now, the new ZX Microdrive has been the subject of much discussion. Which is only to be expected, when the object of everyone's anticipation is *completely* new to the world of computing.

Microdrive provides high-speed access to truly massive storage. With just one Microdrive, you'll have at least 85K bytes of storage, and the ability to LOAD and SAVE in mere seconds. Yet the ZX Microdrive is about the size of a Spectrum mains adaptor, and costs less than £50!

First stocks are now in. Microdrives will be released on an order of priority basis. Spectrum owners who purchased by mail order, direct from us, will be sent full details including how to order, in a series of mailings that begins with the earliest names on our list.

And if you didn't buy by mail order?

Don't worry — for a colour brochure with full information on Microdrives, including how to order, just send us your name and address (use the coupon at the back of this issue of Sinclair Special). But remember, the sooner you send us your name, the sooner you'll get on the list.

Of course, there's much more to Sinclair than Microdrives, as you'll see on these pages. The latest releases of Spectrum and ZX81 software have been amongst the most successful ever. Prices of most established Sinclair products are at their lowest ever. To buy what you want, just use the Order Form.

Until the next issue of Sinclair Special, and more good news ...

Nigel Searle

Nigel Searle, Managing Director, Sinclair Research Ltd.

PS: Come and see us — and all that's new at Sinclair — at the PCW Show, Barbican Centre, from Sept 28th to Oct. 2nd. We'll be pleased to see you!

ZX Microdrive System preview!



ZX MICRODRIVE

At least 85K bytes storage, loads a typical 48K program in as little as 9 seconds: £49.95.



ZX MICRODRIVE CARTRIDGE

Compact, erasable, revolutionary. Complete with its own storage sleeve. Contains up to 50 files, with a typical access time of 3.5 seconds: £4.95.



ZX INTERFACE 1

Necessary for sending and receiving data from ZX Microdrive. Includes RS232 interface, enables creation of local area network of 2 to 64 Spectrums. Attaches to the underside of your Spectrum. Purchased with ZX Microdrive, just £29.95. As separate item, £49.95.



Six new ways to make more of your Spectrum

Take a look at these brand-new titles. Each is an outstanding new program using the full potential of the Spectrum, for games with stunningly animated graphics, for strategies of fiendish cunning, for masterly applications of computing capability...

Cyrus-IS-Chess Based on the Cyrus Program, which won the 2nd European Microcomputer Chess Championship and trounced the previously unbeaten Cray Blitz machine. With 8 playing levels, cursor piece-movement, replay and 'take-back' facilities, plus two-player option. The 48K version has many additional features including an extensive library of chess openings. For 16K or 48K RAM Spectrum.

Horace and the Spiders Make your way with Horace to the House of Spiders, armed only with a limited supply of anti-spider-bite serum. In the house, destroy the webs before the spiders can repair them. Then destroy the spiders, before they destroy Horace! Undoubtedly the creepiest Horace program ever produced! For 16K or 48K RAM Spectrum.

Computer Scrabble The famous board game, on-screen – with the whole board on view! A huge vocabulary of over 11,000 words. Full-size letter tiles, four skill levels – the highest of which is virtually unbeatable. For 1 to 4 players. For 48K RAM Spectrum.
(SCRABBLE trademark and copyright licensed by Scrabble Schutzrechte und Handels GmbH – a J.W. Spear and Sons PLC subsidiary.)

Backgammon A fast, exciting program, with traditional board display, rolling dice and doubling cube. Four skill levels. For experts – or beginners. (Rules are included – it's the quickest way to learn the game.) For 16K or 48K RAM Spectrum.

FORTH Learn a new programming language, as simple as BASIC, but with the speed of machine code. Complete with Editor and User manual. For 48K RAM Spectrum.

Small Business Accounts Speeds and simplifies accounting work, produces Balance Sheets, Profit and Loss information and VAT returns. Complete with User manual. For 48K RAM Spectrum.

Overleaf – your Sinclair order form.

Latest ZX81 software

Prices round-up



These three new cassettes offer two totally different challenges to you and your ZX81. The games — like so many ZX81 games today — really do use the ZX81's capability. The FORTH program is a fascinating extension of your own computer understanding.

Sabotage. Defender or attacker? The choice is yours in this exciting game.

Be the guard and defend the ammunition in the compound — or be the Saboteur and attack it!

Written by Macronics for a ZX81 with 16K RAM. Cassette price: £4.95.

City Patrol. You are the Commander of a

laser-firing ship. Your task is to intercept and destroy alien suicide ships descending on your city.

Written by Macronics for a ZX81 with 16K RAM. Cassette price: £4.95.

FORTH. Discover a new programming language which combines the simplicity of BASIC with the speed of machine code. FORTH's compiled code occupies less than a quarter of the equivalent BASIC program and runs ten times as fast. Free User-Manual and Editor Manual with each cassette.

Written by Artic for a ZX81 with 16K RAM. Cassette price: £14.95.

ZX Spectrum 48K
now just **£129.95.**

ZX Spectrum 16K
now just **£99.95.**

ZX81 now just **£39.95.**

16K RAM Pack for ZX81
£29.95.

ZX Printer now just **£39.95.**

1.2A ZX Mains Adaptor
£7.95.

Printer Paper (5 rolls)
£11.95.

How to order

Simply fill in the relevant section(s) on the order-form below. Note that there is no postage or packing payable on Section B. Please allow 28 days for delivery. Orders may be sent FREEPOST (no stamp required). Credit-card holders may order by phone, calling 01-200 0200, 24 hours a day. 14-day money-back option.

sinclair

Sinclair Research Ltd,
Stanhope Road, Camberley,
Surrey GU15 3 PS.
Telephone: (0276) 685311.

To: Sinclair Research Ltd, FREEPOST, Camberley, Surrey, GU15 3BR.

Section A: hardware purchase

Qty	Item	Code	Item Price £	Total £
	ZX Spectrum — 48K	3000	129.95	
	ZX Spectrum — 16K	3002	99.95	
	ZX 81 (including 1.2A Mains Adaptor)	1003	39.95	
	16K RAM pack for ZX81	1010	29.95	
	ZX Printer	1014	39.95	
	1.2A Mains Adaptor, for use with ZX81 computer/ZX Printer combination (only required if you have an early ZX81 with 0.7A Adaptor)	1002	7.95	
	Printer paper (pack of 5 rolls)	1008	11.95	
	Postage and packing: orders under £90	0028	2.95	
	orders over £90	0029	4.95	
			TOTAL £	

*Delete/complete as applicable.

*I enclose a cheque/postal order made payable to Sinclair Research Ltd for £

Signature

Address

ORDER FORM

Section B: software purchase

Qty	Cassette	Code	Item Price £	Total £
FOR SPECTRUM				
	G22/S Backgammon	4021	5.95	
	G23/S Cyrus-S Chess	4023	9.95	
	G24/S Horace & the Spiders	4022	5.95	
	G25/S Scrabble	4024	15.95	
	L1 /S-FORTH	4400	14.95	
	B6 /S Small Business Accounts	4605	12.95	
FOR ZX81				
	G25: Sabotage	2124	4.95	
	G24: City Patrol	2123	4.95	
	L1: FORTH	2400	14.95	
			TOTAL £	

*Please charge to my Access/Barclaycard/Trustcard account no:

Mr/Mrs/Miss

PCN 908

(Please print)

ZX Microdrive information request

Please send me a colour brochure with full specifications of ZX Microdrive/Interface 1, and add my name to the Microdrive Mailing List! (tick here) ☐ (Remember to include your name and address on the form above).

Euro Atlas

Card 5 of 6

8326EA56

```

3110 DATA 112,145,117,149,113,88,95,72
3120 DATA 68,81,63,92,75,101,68,102
3130 DATA 70,120,63,120,63,126,68,126
3140 DATA 52,136,59,159,80,160,102,192
3150 DATA 102,197,97,195,95,201,87,205
3160 DATA 90,220,85,214,63,219,59,216
3170 DATA 53,216,52,220,28,209,25,213
3180 DATA 12,212,24,183,5,177,0,137
3190 DATA 3,120,13,120,22,83,32,82
3200 DATA 33,90,40,87,39,83,40,80
3210 DATA 44,81,44,47,39,43,41,32
3220 DATA 41,20,49,11,56,11,70,0
3230 DATA 60,23,72,26,71,32,56,46
3240 DATA 66,42,68,46,66,48,71,49
3250 DATA 71,62,73,59,86,60,75,51
3260 DATA 73,41,90,36,92,45,87,49
3270 DATA 90,52,85,54,90,59,86,60
3280 DATA 82,67,67,63,71,55,62,56
3290 DATA 56,46,56,62,44,58,56,62
3300 DATA 58,65,72,73,68,81
3310 VDU 1,2
3320 PRINT @ 0,230;"Do you require more
information? Y/N"
3330 IF GETN=78 THEN GOTO 3520
3335 RESTORE 3400
3340 FOR V=1 TO 10
3350 READ U,I
3360 MOVE U,I
3370 DRAW 120,10+(V*10)
3380 BEEP 200,10,65000

```

```

3390 NEXT V
3400 DATA 56,30,92,45,58,88,11,133,12,14
1
3410 DATA 35,160,39,188,100,111,71,202,1
02,143
3420 WINDOW 61,126,16,245
3430 VDU 1,1,23
3440 RESTORE 3490
3450 FOR N=1 TO 10
3460 READ N#
3470 PRINT N#
3480 NEXT N
3490 DATA 1.JUTLAND(D),2.COPENHAGEN(D),3
.HAMBURG(W.G),4.DUSSELDORF(W.G)
3500 DATA 5.COLOGNE(W.G),6.FRANKFURT(W.G)
),7.STUTTGART(W.G),8.BERLIN(E.G)
3510 DATA 9.MUNICH(W.G),10.DRESDEN(E.G)
3520 VDU 1,2
3530 PRINT @ 0,230;"Do you require anot
her country? Y/N"
3540 IF GETN=78 THEN GOTO 10000
3550 GOTO 50
4000 VDU 1,2
4010 CLS
4020 PRINT @ 61,0;"SWITZERLAND&AUSTRIA"
4030 PRINT @ 61,10;"-----"
"
4040 VDU 1,4
4050 RESTORE 4120
4060 MOVE 47,101

```

4000-4540 Switzerland and Austria

Euro Atlas

Card 6 of 6

8326EA66

```

4070 FOR Z=1 TO 69
4080 READ A,B
4090 DRAW A,B
4100 BEEP 400,10,65000
4110 NEXT Z
4120 DATA 46,106,44,104,42,104,43,110
4130 DATA 41,110,41,107,37,108,35,105
4140 DATA 34,100,32,111,31,113,31,114
4150 DATA 27,107,28,105,24,106,22,111
4160 DATA 13,111,11,104,5,107,5,100
4170 DATA 17,92,14,90,16,88,19,90
4180 DATA 29,89,29,86,32,86,32,88
4190 DATA 40,91,42,90,44,93,47,93
4200 DATA 48,91,51,91,52,93,55,94
4210 DATA 63,89,69,90,72,93,70,84
4220 DATA 76,81,76,78,78,80,80,75
4230 DATA 85,79,91,72,107,76,109,90
4240 DATA 107,90,107,86,103,90,106,92
4250 DATA 101,102,104,108,98,104,89,106
4260 DATA 88,109,84,109,65,104,62,99
4270 DATA 53,100,53,102,50,103,49,100
4280 DATA 47,100,46,98,43,100,39,96
4290 DATA 40,91
4300 VDU 1,2
4310 PRINT @ 0,210;"Do you require more
information? Y/N"
4320 IF GETN=78 THEN GOTO 4520
4330 RESTORE 4400
4340 FOR V=1 TO 8

```

```

4350 READ U,I
4360 MOVE U,I
4370 DRAW 120,10+(V*10)
4380 BEEP 200,10,65000
4390 NEXT V
4400 DATA 20,90,18,97,5,107,29,93
4410 DATA 56,96,83,82,103,84,93,100
4420 WINDOW 61,123,16,245
4430 VDU 23,1,1
4440 RESTORE 4490
4450 FOR N=1 TO 8
4460 READ N#
4470 PRINT N#
4480 NEXT N
4490 DATA 1.BASLE(SW),2.BERNE(SW),3.GENE
VA(SW),4.ZURICH(SW)
4500 DATA 5.INNSBRUCK,6.LINZ,7.VIENNA,8.
BRAZ
4510 VDU 1,2
4520 PRINT @ 0,210;"Do you require anot
her country? Y/N"
4530 IF GETN=78 THEN GOTO 10000
4540 GOTO 50
10000 BEEP 500,500,63
10010 WINDOW 3,123,5,245
10015 CLS
10020 VDU 24
10030 PRINT @ 60,60;"THE END"
10040 VDU 25

```

**LOOK
FOR THE
'ULTIMATE' NAME
FOR THE
'ULTIMATE' GAMES**

JET PAC for the 1640K Spectrum.
JET PAC The Ultimate Space game.
JET PAC Available standard 100 million units of code, variable stage plots,
 including smooth high resolution colour graphics, new alien ship designs
 command all troops with keyboard, you won't find it in ULTIMATE GAME package
 coming this year.

'JET PAC'

PS/ST for the 16/48K Spectrum.
PS/ST - Go grow yourself a real game.
 Arkane standard 100% machine code.
 Award winning smooth high resolution on your visual card.
 PS/ST - The only game that makes your expensive computer pay.
PS/ST - THE ULTIMATE PLAY THE GAME.

'COOKIE'

[illegible]

'PSSST'

'TRAN3 AM'

TRANS AL for the 16/24K spectrum.
TRANS W - The high speed real time rough driving pursuit
 race across America.
TRANS AW - Single player, unlimited 100% adjustable, record
 breaking and unbeatable 100% adjustable, record breaking
 challenge. The ULTIMATE PLAY THE GAME! Design team
 should be available from W. H. SMITH
GROUP CENTRES OTHER LARGE
SOFTWARE RETAILERS
 The GAME for immediate
 order is normally despatched

TRANS AM

Dealership enquires welcome, phone (0530) 411485.

Post this coupon now to: **ULTIMATE PLAY THE GAME, The**
Great, Ashby de la Zouch, Leicestershire LE65 5JU.

Please send me the following

☐ JET PAC

☐ TRANS AM

enclose cheque/PO for £

Name _____

Address _____

☐ COOKIES ☐ PASS

These games should be available from W. H. SMITH, JOHN MENZIES, ROOTS, LACKY'S, SPECTRUM CENTRES, OTHER LARGE DEPARTMENT STORES and ALL GOOD FASHION STORES. Alternatively, send the coupon to the publisher, Granston Ltd, The Granston Building, 100, Broad Street, Birmingham B1 2HT. Subject to availability.

£5.50 each

including VAT, first class postage and packing in UK.

1. ULTIMATE PLAY THE GAME is a fast action, high speed real time rough driving pursuit game for the 16/18K spectrum.

2. THE ULTIMATE PLAY THE GAME, through your accelerator sound effects, will give you the same exhilaration as the real thing.

3. THE ULTIMATE PLAY THE GAME, through your 16/18K GAME monitor, will give you the same excitement as the real thing.

4. THE ULTIMATE PLAY THE GAME, through your 16/18K GAME monitor, will give you the same excitement as the real thing.

5. THE ULTIMATE PLAY THE GAME, through your 16/18K GAME monitor, will give you the same excitement as the real thing.

6. THE ULTIMATE PLAY THE GAME, through your 16/18K GAME monitor, will give you the same excitement as the real thing.

7. THE ULTIMATE PLAY THE GAME, through your 16/18K GAME monitor, will give you the same excitement as the real thing.

8. THE ULTIMATE PLAY THE GAME, through your 16/18K GAME monitor, will give you the same excitement as the real thing.

9. THE ULTIMATE PLAY THE GAME, through your 16/18K GAME monitor, will give you the same excitement as the real thing.

10. THE ULTIMATE PLAY THE GAME, through your 16/18K GAME monitor, will give you the same excitement as the real thing.

Bar Chart

8326BC1/2

Card 1 of 2

Spectrum

Spectrum Basic

Application: Educational

Author: David Leart

A useful program for statisticians

```

10 PRINT AT 0,10;"INSTRUCTIONS":AT 1,1
11 PRINT AT 5,5;"The user first enters
the number of classes for which a bar
is to be drawn." For each class
the name and frequency are then input a
s prompted."
12 PRINT AT 18,0;"Press any key to beg
in"
13 PAUSE 5000
14 CLS
100 DIM F(14)
110 DIM H(14)
120 DIM L(14)
150 INPUT "ENTER NUMBER OF CLASSES (MAX
10) "INC
151 IF INC>10 OR INC<=0 THEN GO TO 150
152 IF INC<4 THEN LET err=0
153 IF INC=4 THEN LET err=1
170 LET NP=INT ((215-(8*INC))/INC)
180 LET MC=INT (27/INC)
185 DIM N$(INC,MC-1)
190 LET MAX=0
195 LET MIN=9999
200 FOR C=1 TO NC

```

```

205 CLS
210 PRINT "ENTER NAME (MAX 4 DIGITS) C
HARAS) AND""FREQUENCY (MAX 4 DIGITS) "
215 INPUT N$(C); " "IF(C)
217 IF LEN STR$(F(C))>4 THEN CLS : PR
INT "NAME MAX 4 DIGITS : "" RE-INPUT LAST SET
OF DATA": GO TO 215
220 IF F(C)>MAX THEN LET MAX=F(C)
225 IF F(C)<MIN THEN LET MIN=F(C)
230 NEXT C
235 CLS
238 LET lam=LEN STR$(MAX)
239 LET len=LEN STR$(MAX-MIN)
240 LET xx=.05
242 IF MAX<=(.1*(10^lam)) THEN LET zz=
.1
243 IF MAX<=(.25*(10^lam)) AND MAX>(.1*
(10^lam)) THEN LET zz=.25
245 IF MIN<(.1*MAX) THEN LET xx=xx*.1
246 IF MAX<=(.5*(10^lam)) AND MAX>(.25*
(10^lam)) THEN LET zz=.5
247 IF MAX>(.5*(10^lam)) THEN LET zz=
1
248 LET inc=(10^lam)*(xx*zz)
249 LET FP=inc/B

```

10-14 Introduction page
100-120 Dimension arrays
150-153 Get and check the number of
classes
170 Work out the width of the bars
180 Evaluate the number of
characters allowed per name

185
190-195
200-230

Dimension the name array
Set up some variables
Get name and frequency for
each class and work out the
maximum and minimum
frequencies for each class

238-249

Calculate the scale for the
frequency axis

Bar Chart

8326BC2/2

Card 2 of 2

```

250 PLOT 32,175: DRAW 0,-167: DRAW 223,
0
260 LET X1=21: LET Y1=0: LET I=0
270 PRINT AT X1,Y1:I
280 FOR V=1 TO 10
290 LET X1=X1-2: LET I=I+inc
300 PRINT AT X1,Y1:(I*2)
310 NEXT V
320 LET X2=21: LET Y2=5
325 FOR P=1 TO NC
330 IF NC=4 AND P=2 THEN LET Y2=Y2+e
rr
332 IF NC=5 AND P=3 OR P=5 THEN LET
Y2=Y2+err
333 IF NC=5 AND P=4 THEN LET Y2=Y2-2
335 IF NC=6 AND P=3 OR P=4 OR P=5 THE
N LET Y2=Y2+err
337 IF NC=6 AND P=4 THEN LET Y2=Y2-2
339 IF NC=7 AND P=2 OR P=4 OR P=6 OR
P=7 THEN LET Y2=Y2+err
340 IF NC=8 AND P=4 OR P=5 THEN LET
Y2=Y2-1
341 IF NC=8 AND P=7 THEN LET Y2=Y2+e
rr
344 IF NC=8 AND P=8 THEN LET Y2=Y2+2
345 IF NC=9 AND P=4 THEN LET Y2=Y2-3
346 IF NC=9 AND P=5 OR P=7 OR P=8 THE
N LET Y2=Y2-err

```

```

347 IF NC=10 AND P>1 AND P<5 AND P<
6 AND P<10 THEN LET Y2=Y2+err
348 IF NC=10 AND P=4 THEN LET Y2=Y2-
2
349 PRINT AT X2,Y2:IN$(P)
350 LET Y2=Y2+MC
355 NEXT P
365 LET X3=40
368 LET ink=INT (RND*4)
370 FOR B=1 TO NC
375 INK ink
380 LET H(B)=(INT (F(B)/FP))-8
390 LET L(B)=H(B)
400 PLOT X3,10+L(B)
410 DRAW NP,0
420 IF B=NC AND NOT L(B) THEN STOP
430 LET L(B)=L(B)-(L(B)>0)+(L(B)<0)
440 IF L(B) THEN GO TO 400
450 LET X3=X3+NP+8
455 LET ink=ink+1: IF ink=4 THEN LET
ink=0
460 NEXT B
465 INK 0
466 INPUT "DO YOU WANT TO RUN PROGRAM"
"AGAIN? (Y/N) " :R$
467 IF R$="Y" THEN CLS : GO TO 150
470 STOP

```

250-310 Plot axes and print the
frequency scale
320-355 Print the names of the classes
368 Randomly select the colour of
the first bar. Note that RND*4
can be changed to RND*7 to
obtain a wider range of colours

370-460
466

Plot the bars
Option to rerun the program

DON'T JUST STAND THERE...



USE THE FAST LANE

28th September-2nd October Barbican Centre, City of London

The PCW Show is Britain's most popular micro event. Hardly surprising, with over 200 exhibitors showing an exciting range of micros, software and peripherals — for business and commerce, education, science, industry and the home.

But if you use a micro at work

(or are thinking of buying one) you can avoid the crush. Just clip the coupon below and send it with your business card and a cheque for £2.00 (normal price £3 at the door!). We'll send you a special "Fast Lane" ticket. And you won't have to play the waiting game.



**28th September-trade only
Entrance by invitation**

THE FAST LANE

Please send me one "Fast Lane" ticket to the 6th PCW Show.

I enclose my business card and a cheque for £2.00 made payable to the "Personal Computer World Show".

NAME.....

ADDRESS.....

Send to Amanda Stephens
PCW Show, 11 Manchester Square
London W1M 5AB

Keyset

8326K1/2

Card 1 of 2

A utility to display the contents of the function keys at the bottom of the screen

```

1000N ERROR NEW:END
110L$=""
120A$=CHR$129+CHR$157+CHR$135
130B$=CHR$129+CHR$157+CHR$151
140C$=CHR$32+"f"
150D$=CHR$32+CHR$32+"f"
160E$=CHR$106+CHR$32
170F$=CHR$32+CHR$53+CHR$32
180L$=L$+A$+C$+"O"+D$+"I"+C$+"2"+D$+"3"
"+C$+"4"+D$+"5"+C$+"6"+D$+"7"+C$+"B"+D$+"9"
190L$=L$+B$+E$+"C"+F$+"L"+E$+"T"+F$+"D"
"+E$+"C"+F$+"M"+E$+"R"+F$+"A"+E$+"R"+F$+"K"
200L$=L$+B$+E$+"L"+F$+"I"+E$+"A"+F$+"I"
"+E$+"A"+F$+"E"+E$+"E"+F$+"U"+E$+"U"+F$+"E"
210L$=L$+B$+E$+"S"+F$+"S"+E$+"P"+F$+"S"
"+E$+"T"+F$+"M"+E$+"N"+F$+"T"+E$+"N"+F$+"Y"
220L$=L$+B$+E$+" "+F$+"T"+E$+"E"+F$+"K"
"+E$+" "+F$+"Y"+E$+" "+F$+"O"+E$+" "+F$+"S"
230%COO=L$

```

BBC 'B'

BBC Basic

Application: Utility

Author: Alistair McLeod

- 100 Sets error-trapping to clear program from memory (line 450 forces a deliberate error to do just that)
- 110-170 Sets string variables to teletext character display codes and necessary text.
- 180-220 L\$ is now set to hold the display lines in one string. The user may change the actual words printed to suit his/her own function settings.
- 230 This string is now stored at &COO and therefore will not be affected by BREAK. The user may decide to place it elsewhere if user-defined characters are needed.

Keyset

8326K2/2

Card 2 of 2

```

240*KEY0 WIDTH0:MMODE7:M
250*KEY1 LIST:M
260*KEY2 *TAPE:M
270*KEY3 *DISK:M
280*KEY4 *CAT:M
290*KEY5 MEM$=CHR$13+CHR$11+CHR$11+CHR$11+"MEMORY SPACE LEFT = "+STR$(HIMEM-TO P)+ " Bytes"+STRING$(80, " ");PRINT MEM$:M
300*KEY6 RENUMBER 100,10:M
310*KEY7 AUTO
320*KEY8 MODE7:MRUN:M
330*KEY9 MODE7:MPRINTTAB(0,20);%&COO;:VDU2B,0,19,39,0:CLS:M
340CLS:VDU 31,0,4
350PRINT CHR$134;" The function key s are now set."
360PRINT CHR$134;" Press KEY 9 to display settings."
370PRINT CHR$134;" Computer will operate normally."
380PRINT CHR$134;" Remember that the following"
390PRINT CHR$134;" control codes are available :-"
400 PRINT TAB(3,10);CHR$131;"Printer"
410 PRINT TAB(3,10);CHR$136;CHR$129;CHR$157;CHR$135;"ON"
420 PRINT TAB(3,13);CHR$130;"Page mode"
430 PRINT TAB(3,17);CHR$133;"Clear text window"
440PRINT TAB(3,17);CHR$133;"Clear text window"
450END

```

- 240-330 Definition of function keys. Again the user may wish to change the key definitions in lines 190-220 to suit those in lines 240-330
- KEY0 clears the complete screen, including the key display
- KEY1-4 are self explanatory.
- KEY5 displays the remaining memory space left, excluding variables
- KEY6 is self-explanatory.
- KEY7 does not include a CTRL M (carriage return) so that the user can start line-numbering where necessary.
- KEY8 clears the whole screen and runs the current program.
- KEY9 displays the function key settings (this is the only one you have to remember)
- Clears the screen and sets the printing position
- Simple coloured text output reminding the user of the handy control functions
- 450 Lower case End produces a deliberate error to be trapped by line 100 to clear the program memory.

From the
publishers of
Personal Computer World

SLAYS INFERIORS



ots of micro magazines pretend to take computer games seriously. But seriously, as a person with the perspicacity to read this magazine, you know better. Yet you still want to play games with your micro, rather than let your micro play games with you. So that's why from July

published by VNU called 'Personal Computer Games' which will help you do just that. No matter what micro you own, 'Personal Computer Games' will tell you everything you've ever needed to know about the games you can play with your micro. And the wherewithal of playing them. Make sure you don't miss out. Shoot on down to your newsagent, or use the coupon below to order your copy. Now! And start winning, winning, winning.

onwards, you can buy a special magazine

- ☐ I enclose my cheque made payable to Personal Computer World for £1.35 (P & P inclusive)
- ☐ I enclose my postal order payable to Personal Computer World for £1.35
- ☐ Please debit my American Express/Access/Barclaycard (delete where not applicable)

Account no. _____

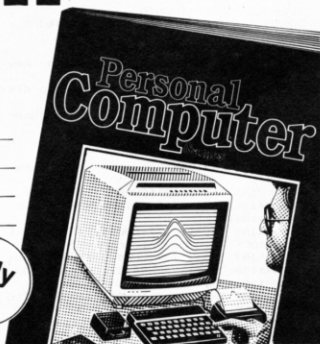
Signed _____

Name _____

Address _____

Please send this order, with your remittance to: Personal Computer World, Circulation Dept., Freepost 38, London W1E 6QZ.

only
85p



Clubnet keeps you in touch with enthusiasts throughout the country. It is divided into clubs and user groups and a list of each is published on alternate weeks.

This week it is the turn of clubs, which are listed alphabetically by county and town.

Medway modems



Every computer that's had its day need not be consigned to the back of a cupboard forever, as members of the Medway Amateur Computer & Robotics Organisation (MACRO) could tell you. Just one such machine, built years ago by a founder-member, is about to be reinstated in a central position in the club.

It is their S100 system using 8in twin floppies, CP/M-based and dating back just about all the eight years of their existence.

Members have developed text-type games on it and taught themselves Basic programming and machine code development. 'For a while, it has languished,' said club member Mike Hutchins, 'as we tend to have our own systems. Now its going to help provide a club database.'

This is the club's current project and 13

members are at different stages of building their own modems. Paul Cameron, another club member, explained: 'To begin with, we're setting up everyone interested with an acoustic modem. If we have enough, we'll have a small mailbox system here at the club's meeting place.'

The club's long-standing members regret that some people who have recently visited the club may have been put off a second visit because they felt they didn't know enough about electronics to participate fully. But such an impression would be a mistake. Mike Strickland, currently setting up his own modem, claimed never to have seen an integrated circuit board in his life before.

Members at this meeting proved a point. Although a number were engrossed in

If your association has something special on the agenda or if you've just started a new one, contact us at *Clubnet, Personal Computer News*, VNU, 62 Oxford Street, London W1A 2HG.

Our Clubnet report this week focuses on the Medway Amateur Computer & Robotics Organisation.



Members work on their modems — part of the mailbox project

modems, others were busy elsewhere. Tony Pink and Peter Sells were occupied on a program they are designing. 'I'm in the newspaper world and I'm looking at how we can make use of computers by developing a wholesale newspaper distribution package,' said Tony.

But it's not all hands-on practice. The club also organises talks which recently included a series on Assembly code, and a demonstration by Kent County Library of its international database.

Harriet Arnold

Name Medway Amateur Computer & Robotics Organisation (MACRO) **Venue** Unit 3, Walderslade Centre, Walderslade Road, Chatham, Kent **Meetings** First Tuesday and third Wednesday of each month **Contact** Paul Cameron, 0634 63036.

CLUBS

AVON

Bristol Berkeley Nuclear Laboratories Club. Contact Neil Walker, 53 Wolfride Rise, Alveston, Bristol, 0454 414262.

Bristol Micro Computer Club. Meets at the Pavilion, Southend Road, Filton, Bristol, every other Tuesday. Darryl Collins, 60 Mackie Rd, Filton, Bristol BS12 7NA, 0272 792982.

Bristol Format 40/80 Disc Club, for BBC disk users. Contact Peter Hughes, Format 40/80 Disc Club, c/o The Lending Library, Five Marshall Street, Bristol BS1 4AA.

Multi-User Club Valerie Boyde-Shaw, Nailsea BS1537.

Worke Computer Club. Meets at Woodsprings Inn Functions Rooms on alternate Mondays at 7-10.30pm. H Bennett, 0934 514902 or F Feeney, 0934 833122.

BEDFORDSHIRE

Bedford Amateur Computer Club. Meets at Star Rowing Club, Bedford, on the first and third Tuesday of month 8pm. Rowan Bird, 74 High Street, Great Barford, MK44 3LB, 0234 870763.

Chiltham Computer Club. Meets at Five Bells, Eaton Bray, Near Dunstable, Leighton Buzzard on second and fourth Monday of each month. Contact Steve Betts, 42 Wallace Road, Eaton Bray, 006 20F, 0525 220922.

Luton College Computer Club. John Radford, 0582 3411.

Luton Computer Club. J P Fletcher, 1 Trowbridge Gardens, Luton, LU2 7JY, 0582 450687.

BERSKIRE

Easthamstead Computer Club. Meets at Easthamstead Park School, Bracknell, on the first Wednesday in month at 8pm. Brian Poulton, 0344 84423.

BIRMINGHAM

Birmingham Amateur Computer Club. Meets at Free Church Hall, Land Lane, Marston Green, Birmingham on first and third Thursday of each month at 7.30pm. Contact Les Moore, Secretary, Wolverhampton 725340.

BUCKINGHAMSHIRE

Aylesbury Computer Club. Meets at Quarendon Youth Club every Friday at 7.30pm and at Mandeville County Secondary School the first Thursday of each month at 7pm. Ken Knight, 22 Mount Street, Aylesbury, 0296 5181.

Chiltham Microcomputer Club. Meets at the Garden Centre, School Lane, Chalfont St Giles, on the first Wednesday of each month. Mrs W Tibbitts, Elwood, Deansway, Chalfont St Giles, 024 07 4906.

Iver Computer Club. P A Seal, 1 Ormonde Flats, Church Road, Iver Heath, 0753 652792.

Iver Computer Society meets at Huntsmore Road, Iver Village Hall on the second and fourth Thursday every month at 7.30. John Haigh, 141 Lees Drive, Iver, SL0 9RP.

CAMBRIDGESHIRE

Cambridge Microcomputer Club. Meets on the third Wednesday of month. Derek Tripp, 3 Squireways Avenue, Waterbeach, 0223 315662.

Petersborough Personal Computer Club meets at Crosfield Electronics Social Club, fortnightly on Mondays. Andrew Pike, 073 44342 after 5pm.

CHESHIRE

Altrincham Computer Club. Meets at N. Cestrian Grammar School, Durham Road, Altrincham, fortnightly. Martin Hickling, 39 Barrington Road, Altrincham, WA14 1H2, 061 941 4547.

Brund Computer Club. Meets at St Werburgh Community Centre on alternate Wednesdays at 7 to 10pm. Mr R Simpson, 4 The Coats, Stockwood.

Chester Computer Club. Contact W Collins, 37 Garden Lane, Chester, Cheshire.

Crew Computer Users Club meets at Buffaloes Club, Earl Street, Crew, on the third Thursday of each month at 8pm. Bram Knight, 0270 623375.

Holmes Chapel Micro Club meets at Leisure Centre, Holmes Chapel at 7.30 to 9.30pm on the first and third Tuesday of month. Margaret Baker, 1 Helton Close, Crew, 0477 34238.

Kinder Peak Computer Club meets at Bew Mills School every Monday. John Eary, New Mills 43870.

Kettleshelm National Computer Buyer's Club. Send SAE to Barry Edwards, Lanside House, Paddock Lane, Kettleshelm, nr Stockport, Cheshire.

New Mills & District PCC meets at New Mills School, Stockport, SK12 3DH, 0663 44051.

Northwest Computer Club meets fortnightly. John Lightfoot, 13 Aston Drive, Frodsham, Warrington, WA6 7PU, 0728 31519.

Northwest Computer Club, weekly meetings. Tom Wyatt, 29 Summer Lane,

Halton, Runcorn Cheshire WA7 5PG.

Runcorn 77545.

Mid-Cheshire Computer Club meets at Winsford Library on the second Friday every month at 7.30pm. Simon Sadler, Winsford 53339.

Stockport Software Exchange Club. Send SAE to P Redford, 53 Cavendish Road, Hazel Grove, Stockport, Cheshire.

CLEVELAND

Cleveland Micro Club meets on the second and third Tuesday of each month, under 18s on second of month, over 21s on third Tuesday of month. J Telford, 13 Weston Crescent, Norton.

Stockton Amateur Computer Club meets at YMCA, Stockton, each alternate week at 7-9pm. Peter Cheshire, 60 Croft Road, Eaglescliffe, Stockton-on-Tees, TS16 0DY.

CORNWALL

Cornwall Radio Amateur Club — Computing Section. Bob Reason, 24 Mitchell Road, Camborne.

Cornwall Area PAIC meets at the Penzance Micro Centre every Friday. S Zenith, Hayle 754845.

St Austell Computer Club and Computer Town meets at ECIP Labs, Penzance Road, fortnightly on Mondays at 7.30pm. N G Day, 2 Glendale Close, St Austell.

CUMBRIA

Ambleside Computer Club. Contact Jeremy Westernman, 8 Hill Top Road, Ambleside, Cumbria. Tel: Ambleside 2452.

DERBYSHIRE

Derby Micro Society meets at Littleover Church Hall, Shepherd Street, on every other Thursday at 7pm. Mike Riordan, 0332 769440.

Glossop Computer Club. John Dearn, 2 Spinnery Close, Glossop.

DEVON

Brixham Computer Users Club. Meets at Computer Systems (Torbay), Pump Street, Brixham, Saturdays at 2.30pm. Ian Chipperfield, 22 Brookdale Court, Brixham, Devon (Brixham 59224).

Computers Against the Bomb. Contact Paul Couchman, 29 Clifton Place, North Hill, Plymouth, Devon.

Exeter & District Computer Club meets at Exeter School, Magdalen Road, Exeter, on the second and fourth Tuesday every month. T. Holden, 14 Greenville Avenue, Teignmouth, TQ14 9NT.

Exeter & District Amateur Computer Club meets second Tuesday every month. Doug Bates, Fortescue House, Stoke Canon, Exeter. Specialist meetings on third and fourth Tuesday.

Okeahampton Computer Club. Contact Cheri Graebe, Okeahampton 3523, or Okeahampton Community College, Okeahampton 3800. Meets 7pm each Monday during term time.

South Molton Computer Club. Meets at South Molton Tool Hire, Dootson House, Cooks Cross Industrial Estate, South Molton, North Devon, each Thursday at 7pm. Contact Nick News on 07895 3446.

Torbay Users Computer Club meets at Devon Computers, 39 Totnes Road, Paignton on Mondays fortnightly.

DORSET

Bournemouth Area Computer Club meets at Kinross Community Centre on the third Wednesday every month. Peter Hibbs, 54 Runnymede Avenue, Bournemouth, BH11 9SE. 0202 576547.

TOPIC meets at Canteen English Truck Centre on the second and fourth Wednesday every month at 7pm. David Washford, 1 Alexander Road, Bournemouth, BH6 5JA.

Purbeck Computer Club contact Dean 31 North Street, Wareham, Dorset BH20 1AD.

DURHAM

Darlington Computer Club, weekly meetings. L. Boxell, 8 Vane Terrace, Darlington DL3 7AT. 0325 67766.

ESSEX

Genies Computer Club, 30 Webber House, North Street, Barking.

Great Dunmow Computer Club. Contact T Coombs, 4 Oakroyal House, Oakroyal Avenue, Great Dunmow, Essex CM6 1HQ. **Brentwood** Amateur Computer Club, meets once a month. R Sadler, 18 Warescot Road, Brentwood, CM15 9HD. Brentwood 232463.

Springfield Computer Club meets on the first Friday of every month. Stephen Cousins, 1 Alderbury Way, Springfield, Chelmsford, CM1 5PB. 0245 50155.

Weymouth Computer Club. Contact Dean Williams, 17 Mornington Road, Canvey Island, Essex SS5 6AT.

Colchester Microprocessor Group meets at University of Essex on the second and fourth Wednesday of every month at 7.30pm. Information Centre, University of Essex, near Colchester.

Colchester Computer Society. Meets at Severalls Hospital Computer Club, Colchester. Contact A Potten, 14 Foxmead, Rivenhall, Witham, Essex CM8 3HD. Witham 516335.

Stanway School Computing Club, only school members at present. G Floyd, c/o Physics Department, Stanway School, Stanway, Colchester.

Valerie Multi-User Club. Contact Valerie Boyle-Shaw, 0272 851337.

Romford Club, a new club. Mr D Norden, 138 Church Road, Romford.

Roundcare Micro Computer Users Club. Meets at the Roundcare Youth House, Landon Link, Basildon every Wednesday at 7.30pm. Contact Mrs L Daden, Basildon 85119.

South East Essex Computer Society meets at Hockey Club at Roots Hall, near

Southend Football Stadium on Wednesday at 7.30pm. Robin Knight, 128 Little Wakering Road, Little Wakering, Southend-on-Sea. 0702 218456.

GLOUCESTERSHIRE

British Amateur Electronics Club, Mr J Marjett, 3 Bishopstone Close, Golden Valley, Cheltenham.

Cheltenham Amateur Computer Club meets on the third Tuesday of each month at 7.30pm. Mike Pullin 0242 25617.

GC&O, D Adam, 16 Court Road, Prestbury, Cheltenham.

Cheltenham Amateur Computer Club meets at Prestbury Scout Headquarters, on the third Tuesday of every month at 7.30pm. M Hughes, 36 Riverways Way, Cheltenham.

HAMPSHIRE

Commonore Computer Club. Meets on the first Friday of every month at Bury House, Bury Road, Gosport at 7.30pm. Brian Cox. Fareham 280530.

Fareham and Portsmouth Amateur Computer Club, Alan Smith, c/o Francis Close, Lee-on-the-Solent, Gosport, Hants PO13 8HB. 0705 550907.

RAF Odiham Computer Club. Contact c/o Officer, Royal Air Force, Odiham, nr Basingstoke, Hants.

Southampton Amateur Computer Club meets at Crestwood Centre, Shakespeare Road, Boyatt Wood, Eastleigh, Hants, on the second Wednesday of every month at 7.30pm. Paul Blitz, Chandlers Ford 69050.

HEREFORD

Hepford Amateur Computer Club, proposed new club. Stuart Edinborough, 2 Warwick Walk, Bobblestock, HR4 9TG. 0432 269700.

HUMBERSIDE

Bridlington Microcomputer Club. Meets 7.30pm alternate Fridays at Old Star Inn, High Street, Bridlington. Contact D Compian, 0262-860189.

Grimsby Central Library fortnightly on Mondays at 7.30pm. Jensen Lee, 29 Park View, Cleethorpes. 0472 4259.

Scunthorpe & District Microprocessor Society meets at Community Centre, Lindon Street, Scunthorpe, every Tuesday at 7.30pm. G Hinch, 21 Old Crosby, Scunthorpe, South Humberside DN15 8PU.

KENT

Canterbury ACC proposed new club. Contact L Fisher, 21 Manorwood Avenue, St Stephens, Canterbury, CT2 7AH.

Gravesend Computer Club. Meets at School Room Extra Traction Club, 39 The Terrace, Gravesend. Contact c/o The Extra Traction Centre, 0474 50677.

Medway Amateur Computer & Robotics Organisation. Meets at 7.30pm on first Tuesday and third Wednesday of every month. Annual subs £5. Contact Paul Cameron, Unit 3, Walsderdale Centre, Walsderdale Road, Chatham, Kent, 0634-63036.

North Kent Amateur Computer Club meets at Lecture Theatre, Charles Darwin School, Jay Lane, Biggin Hill, on the first Thursday of every month at 7.30pm. Ian Hoise, 28 Canadian Avenue, Catford SE6 3AS. 01-690 5441.

Orpington Computer Club meets at The Large Hall, Christ Church, Chatterhouse Road, Orpington, every Friday at 8pm-10.30pm. Mr P Pratt, 23 Arundel Drive, Orpington, Kent BR6 9JF. Orpington 20281.

National Personal Computer User Association, Eric Keeley, 11 Spratling Street, Manston, Ramsgate, Kent.

Sevenoaks School Computer Club. G Sommerhoff, Technical Centre, Sevenoaks School, Sevenoaks, Kent. 0732 456340.

Tonbridge & Tonbridge ACC. Ray Skazkowski, 1 Cromer Street, Tonbridge. 0732 355960.

LANCASHIRE

Blackburn Micro Computer Club, Roger Longworth, 12 Sharp Close, Accrington.

Bolton Computer Club meets at E4-24 Bolton Institute of Higher Education, Deane Road, Bolton, on Thursdays. David Atherton, 16 Douglas Street, Asherton, Manchester M29 9FB. 0942 876210.

Burnley Computer Club meets at Burnley Technical College on Tuesdays, 7.30-11pm. Contact Cive Talon, 27 Bassett Street, Burnley, Lancs.

Chorley Computer Club meets at Townley Arms, Chorley, every other Tuesday at 8pm. Tony Higson, 23 Brook Road, Chorley, Lancs. Chorley 68429.

Ribble Valley Computer Club meets at Staff Canteen, Pendle Carpets Ltd, West Bradford, on the second and fourth Wednesdays at 7.30pm. Contact Ian Thornton-Bryer, 25 Southfield Drive, West Bradford, Clitheroe, BB7 4TU.

Lancaster & Morecambe Computer Club. Sarah Blackler. 0524 33553.

South Chadderton Computer Club meets at Turf Lane Centre, Turf Lane, Chadderton, on Thursdays at 7-9.30pm. David Sholes, 18 Beech Avenue, Oldham, Lancs.

LEICESTERSHIRE

East Leake Computer Club. Andrew Jones, 59 Bateman Road, East Leake, Loughborough, LE12 6NN.

Hawker Sidelley Computer Club. Contact R Wrathall, 6 Naseby Drive, Loughborough LE11 0WU.

LINCOLNSHIRE

Lincoln Computer Club, meets at Blandings Public House, High Street, Lincoln on the first and third Wednesday of every month. John Clifford, 44 Newark Road, Lincoln LN6 8RX. 0522 2168.

Skegness Computer Club, meets at County Hotel every other Monday, 7.30-9.30pm. Rag Potter, 118 Beresford Avenue, Skegness. 0754 3594.

LIVERPOOL

BBC Microgroup Liverpool meets at Old Swan Technical College, Liverpool, on the first Wednesday of month. Nick Kelly, 56 Queens Drive, Walton, LA 65H.

LONDON

Croydon Computer Club. BBC groups meet 7pm, first and fourth Tuesday of each month at Croydon Central Library. Contact Mr Khazaba, 10 Lawrence Road, South Norwood, London, SE25. 01-653 3207.

Computer Users Club. Tony Latham 01-304 3910.

East London Amateur Computer Club meets at Harrow Green Library, Cathall Road, E11, on the second and fourth Tuesday of month at 7-10pm. Fred Linger on 01-554 3288.

Forum-80 London. Leon Jay. 01-286 8207.

Forum-80 Wembley. Victor Saleh, 01-902 2546.

Harrow Computer Group meets at Harrow College of Higher Education, Room W24, Northwick Park, on alternate Wednesdays at 7pm. Bazyley Butcher, 01-950 7068.

Imperial College Microcomputer Club meets at room 145, level 1, on Tuesdays at 7.30pm. Tim Panton, c/o I.C. Union Office, Prince Consort Road, London SW7 2BB.

London School Computer Club. Burlington College, Dane Building, DuCane Road, Hammersmith.

Metropolitan Police Amateur Computing Club meets on the first Thursday of month at 7pm. S Farley, 01-725 2428.

68 Microgroup meets at Regents Park Library, Robert Street, NW1, on the third Tuesday of month at 7.30pm. Jim Anderson, 41 Peabworth Road, Harrow, Middlesex.

North London Computer Club meets at the Polytechnic of North London, Holloway, N7 8DB, on Monday, Tuesday, Wednesday and Thursday during term time and one evening a week during holidays. Robin Bradbeer, 01 4607 2788.

Paddington Computer Club meets at Paddington College, 25 Paddington Green, W2 1NB. Peter Hill, 01-723 5762.

Post Office HQ Microcomputer Club meets at room B145, River Plate House, 12-13 South Place, off Moorgate, on the second Thursday of month. Vernon Quintance, British Telecom Enterprises, Chapside House, 138 Chapside EC2U 6JH. 01-726 4716.

Queens Crescent Computer Club. Meets at Queens Crescent Library, 155 Queens Crescent, London NW5. 01-485 4551.

The SOBAT Computer Club meets once a fortnight. Mr T Kayani, 12 Calderon Road, London E11.

South East London Microcomputer Club meets at Thames Polytechnic, Greens Ends, Woolwich SE18, on alternate Wednesdays at 7pm. Peter Phillips, 61 Grainger Road, SE3. 01-853 5829.

Southgate Microcomputer Club meets at Room B106 Southgate Tech, fortnightly on Thursdays at 7.30pm. Kevin Pretorius 01-882 2282. See Prestin page 258/20645.

West London Personal Computer Club meets at Back room, Fox & Goose pub, Hanger Lane, Algham, on the first Tuesday of month at 7.45pm. Graham Brain, 01-497 8986.

MANCHESTER

Manchester Computer Club meets at the Department of Computer Science, Manchester University, Oxford Road, on the first and third Thursday of month at 7.30pm. David Wade, 061-941 2486.

Small Business Computer Users Club. Proposed new club to meet the last Tuesday of month. K Wadsworth, 061-740 7232 after 5pm.

South Trafford Microcomputer Club. Meets fortnightly. Contact Ian White, 16 Leicester Avenue, Timperley, Altrincham WA15 6HR, 061-969 2080.

MERSEYSIDE

Merseyside Microcomputer Group meets at Merchant Taylor's School, Crosby, on the second Thursday of month. Mr F Shaw, 14 Albany Avenue, Eccleston Park, Prescot. 051-425 5536.

Southport Computer Club meets weekly. Ian Bristone, 28 Wold Road, Southport, Merseyside PR8 2LD. 0704 64524.

Wirral Microcomputer Users Group meets at Birkenhead Technical College every Monday. J Phillips, 14 Helton Close, Birkenhead, Merseyside L43 9HP.

Wirral Computer Club. Contact Gary McElwaine, 24 Marlston Avenue, Irby, Merseyside.

MIDDLESEX

Bridgeline Computer Club. Meets on the first and third Monday of every month at Brigadier Youth Centre, Brigadier Hill, Enfield at 7.30 pm. Subs: £2. Contact Steve Ward, 28 Brodie Road, Enfield, Middx EN2 0EU. 01-363 3786.

Microcomputer User Association. Meets three times a year. Contact Phillip Matthews, Philip Morris House, 21 High Street, Feltham TW13 4AD, 01-751 6388.

Sunbury Computer Club meets at St Benedicts Hall, Napier Road, Ashford, on the last Tuesday of month at 8pm. Simon Taylor, 8 Priory Close, Sunbury-on-Thames, Middlesex. Simon Clark, 83 Watling Street, Towcester, Northants NN12 7AG.

ZX Micro Club. Contact Paul Hargreaves, 10 The Ride, Brentford, Middx.

NORTHAMPTONSHIRE

Corby Universal Micro Club. Meets at Lodge Park Sports Centre fortnightly on alternate Wednesdays and Thursdays. Contact Peter Wilson, 26 North Cape Walk, Corby, tel: Great Oakley 742822.

South Northants Computer Club meets at Anchor House, Moat Lane, Towcester, on Wednesdays at 7.30pm.

NOTTINGHAMSHIRE

Ashfield Computer Club meets at Carsic Junior School, St Mary's Road, Sutton in

Ashfield on the first and third Thursday month. Derick Daines, c/o Cuttings Avenue, Sutton in Ashfield, Nottingham NG16 3BJ.

Nottingham Microcomputer Club meets at the Gate Centre, Nottingham, Monday at 7.30pm. Mr E Harvey, 68 Roseligh Avenue, Nottingham NG3 6FH. Nottingham 608491.

Workop Computer Group. Mr Andrews, Workop 487327.

NORFOLK

Anglia Computer User Group. Jan Reizl, 128 Templers, Sprowston Road, Norwich. 0603-29652.

Brecklands Computer Club. Contact Andrew Hom, 11 Amateles Close, Telford, Norfolk. Meets each Saturday, 5pm at this address.

Derham & District Computer Club. Meets at Middle School, Westfield Road, Toftwood, East Dereham on every second Wednesday at 7.30pm. Contact Mrs Fran Cook, Dereham 67732.

East Anglian Computer User's Group meets at Cromie Community Centre, Telegraph Lane, Norwich. Gill Rizi, 88 St Benedicts, Norwich.

OXFORDSHIRE

Association of Computer Clubs. Rupert Steele, St John's College, Oxford OX1 3JP. Meets monthly at Clarendon Lab, Parks Road, Oxford, every week during term. Rupert Steele, St John's College, Oxford OX1 3JP.

Oxford Personal Computer Club. Len Phelps, Southport Cottage, Sutton Courtenay, Nr Abingdon, Oxon OX14 4AU.

Ridgeway Computing Club meets at Swan Hotel, East Isley, on the second Tuesday month. Mike Magney, Beavers, South Street, Blunbury, Didcot, Oxon OX11 0JU.

SHROPSHIRE

Ludlow & District Microcomputer Club meets at Diocesan Education Centre, Lower Galdeford, Ludlow, on the second Monday of month at 7.30pm.

Shrewsbury Micro Club meets at Shrewsbury Shirehall once a month. Mr V Ives, 5 Bramley Close, Severn Meadows, Shrewsbury SY1 2TP.

Telford Computer Club meets at Telford ITEC on Monday 6-9pm. John Murphy, 10 Brimchore, Brookside, Telford TF3 1TF. 0952 959599.

SOMERSET

Sharp M280 Club, Tim Powell, Computer Centre, Yeovil College, Yeovil, Somerset. **Yeovil** Computer Club. D G Carrington, 2 Romsey Road, Yeovil, BA21 5XN.

STAFFORDSHIRE

Alsager Computer Club, meets at Alsager Comprehensive School, Stoke-on-Trent, Staffs, fortnightly on Tuesdays. Rex Charlesworth, 09363 77270.

North Staffs Amateur Computer Club meets on the third Wednesday of each month. J Roll, 16 Hill Street, Hednesford, Staffordshire WS12 5DS.

ICI Birmingham Branch Micro Club, c/o WBA Ecclestone, 26 Browns Lane, Tamworth, Staffs.

Tame Valley Computer Club, Tim Marshall, 32 Milton Avenue, Leylands, Tamworth, Staffordshire B79 8JG.

SUFFOLK

Harverhill Microcomputer Club, meets at St Mary's Church Hall, Camps Road, Harverhill, on the second, third and fourth Wednesday of month from 7.30 to 10.30pm.

Andrew Holliman, 5 Trinity Close, Ipswich, CB1 6DW. 022 629 583.

Newmarket Home Computer Group. Meets at Anchor House, Moat Lane, Towcester, at 7.30pm. Contact Simon Clark, 83 Watling Street, Towcester, Northants NN12 7AG, 0327 52191.

Suffolk Microcomputer Club meets monthly. Mr S Pratt, c/o Microtek, 15 Lower Brook Street, Ipswich.

SURREY

Ashford Computer Club meets on the last Thursday of month. Contact P Palmer, 8 Corle Close, Ashford.

Deaf Microcomputer Users Group. Contact Chris Marsh, 3 Delaporte Close, Epsom, Surrey KT17 4AF.

Thames Valley Amateur Computer Club meets at Griffin, Caversham, on the first Tuesday of month. Brian Quarm, 25 Woodcrown, Camberley, GU15 1NR. 0251 22186.

Reid Micro Club, Dave De Silva, 136 Kingston Road, Ewell, KT19 0SU.

Farnham Computer Club, meets at Farnham 6th Form College, Morley Road, Farnham, on the second Wednesday of month. Adam Sharp, 14 Thorn Road, Boudonstone, Farnham.

West Surrey Computer Club meets at Paddock Room, Green Man Public House, Burgham, Guildford, for the first Thursday of month. Chris Karney, 0483 68121.

ITM Computer Club meets on Fridays. A Bond, 54 Farnham Road, Guildford, Surrey GU2 5PE. 0485 62035.

CBIS London meets on Sundays 4-10pm. P Goldman, PO Box 100a, Rendon, KT5 8B5.

Sutton Library Computer Club meets at Central Library, St Nicholas Way, Surrey, on the first Friday of month at 6pm and second and third Tuesday of month. Dave Wilkins 01-642 3102.

Midhurst & District Computer User Group. Meets at the Grange Centre, Midhurst, at 7pm on the second and fourth Thursday of every month. Contact Val Weston, tel: Midhurst 3876.

Association of London Computer Clubs. Len Stuart, 89 Mayfair Avenue, Worcester Park, KT4 7SJ.

SUSSEX

Arundel Microcomputer Club meets at Wick Amenity Centre, Wick Farm Road, Little-amble, Arundel, on the second Monday at 8pm, and third Sunday of month at 6pm. P Chermain, 7 Talbot Road, Littlehampton, West Sussex DN17 7BL.

Brighton, Hove & District Computer Club. Meets 7.30pm every second Wednesday at Southwick Community Centre. Contact J Smith, 30 Leicester Villas, Hove, E Sussex. 01323 84207.

CCVC Video Games Club. Contact G Bond, 7 Swift Lane, Langley Green, Crawley Sussex.

Mid-Sussex Microcomputing Club. Contact Jeff Hayden, 2 Hillary Close, East Grinstead, RH19 3XQ.

Richmond Computer Club meets at Richmond Community Centre, Sheen Road, on the second Monday of month at 8pm. Bob Foster, 18a The Barons St Margarets, Twickenham, Middlesex, 01-892 1873.

West Sussex Microcomputer Club meets at Room R06, Robinson Road Annex, Crawley, on the first and third Monday of month. J Clarke, 31 Hyde Heath Court, Pound Hill, Crawley, 0293-884207.

Worthing & District Microcomputer Club meets at Rose Wilmore Youth Centre, Littlehampton Road, Worthing, on alternate Sundays 11am-1pm. B. Thomas, 11 Gannon Road, Worthing, W. Sussex. BN11 2DT, 0903 36785.

TYNE & WEAR

Newcastle upon Tyne Personal Computer Society meets at Room D103, Newcastle Polytechnic on the first Tuesday of every month. Pete Scargill, 21 Percy Park, Tynewood, 06325 57305.

WEST MIDLANDS

Cannock Computer Society meets at Cannock Computer Systems, Old Penkridge Road, Cannock, fortnightly. Terry Sale, 20 Redwood Drive, Chase Terrace, Walsall WS7 8AS.

Coventry Computer Circle. Contact Chris Brough, 9 Hillman House, Smithford Way, Coventry CV1 1FZ.

Coventry Micro Club meets on Wednesdays at 7.30pm at Walsgrave Junior School. Jack Hewitt, 34 Boswell Drive, Walsgrave-on-Sowe, Coventry. Tel: 615543.

National Universities Personal Computer Society. P Moore 021-236 6176, ext 382.

Walsall Computer Club meets at Park Hall Community School on the second and fourth Monday month 6.45-9.45pm. Alison Hunt, 58 Princes Avenue, Walsall, WS1 2DH, 0922 23875.

West Midlands Amateur Computer Club meets at Enfield School, Love Lane, Stourbridge, on the second and fourth Tuesday of month. John Tracey, 100 Booth Close, Brierley Hill, Kingswinford, 0384 70097.

WILTSHIRE

Chippenham and Calne, proposed new club. Matthew Jones, Pinnills, Calne SN11 0LY.

WORCESTER

Worcester & District Computer Club meets at Old Pleasant Inn, New Street, Worcester, on the second Monday month at 8pm. D Stanton, 55 Vauxhall Street, Rainbow Hill, WR3 8PA.

YORKSHIRE

Barnsley Co-Operative Computer User Group meets at Co-Op Social Club, Pogmora, Barnsley, on the last Tuesday month at 7.30pm. James Bridson, c/o 39 Kerelhof Hall Road, Barnsley, South Yorks S70 6NF, 0226 41753.

Greenhead Grammar School Computer Club. Brian Smith, Greenhead Road, Keighley, West Yorks BD20 6EB, 0535 62828.

Huddersfield Computer Club meets every Monday. Chris Townsend, 760/4 Manchester Road, Lintwhale, Huddersfield, 0484 657299.

Leeds Microcomputer Users Group meets at 8 Regent Street, Chapel Allerton, fortnightly on Thursday at 7.30pm. David Parsons, 22 Victoria Walk, Horsforth LS18 4PL.

Pewsey & District Computer Club meets at 26 Mill Hey, Haworth, W Yorks, on Saturday and Sunday. Douglas Bryant, 26 Mill Hey, Haworth, W Yorkshire, 0535 43007.

Program Group, R Simpson, 5 Wensley Road, Leeds LS2 2BX, 0532 863186.

Shipley Computer Club meets on Tuesdays. Paul Channell, tel: 0274 595731.

South Yorkshire Personal Computer Group meets at General Lecture Theatre, St Georges Building, Mappin Street, Sheffield, on second Wednesday month at 7.30pm. Paul Sanderson, 8 Vernon Road, Telford, Sheffield S17 305.

Thorncliffe & District Micro Users' Club meets at Thorncliffe Comprehensive School, Physics Lab, Clayton Lane, Thorncliffe, Wednesday at 7.30pm during school term. Mr James Davis, 62 Tudor Street, Thorncliffe East, 0709 693880.

West Yorkshire Microcomputer Group meets on Tuesdays. Philip Clark, c/o Suite 204, Crown House, Armley Road, Leeds LS12 2SE, 0532 632532.

York Computer Club meets at the Enterprise Club every Monday at 8pm. K Thomas, Green Lea, Ripon Road, Harrogate, HG1 2BY, 0904 38239.

SCOTLAND

Bishopston Computer Club meets at 'Cwa Ben', Sachelcourt Avenue, Bishopston, Renfrewshire, on Sunday once a month (Aberdeen) 10. Dundas Road.

Bishopston, Renfrewshire PA7 5EF.

Edinburgh Home Computing Club meets at Claremont Hotel, Edinburgh, on the 2nd, 3rd and 4th Wednesday of month. I. Robertson, 031 441 2361.

Scottish Amateur Computer Society, Mike Anthony, 46 Moredun Park Gardens, Edinburgh EH17 7JR.

Central Scotland Computer Club meets at Falkirk College of Technology, Grangemouth Road, Falkirk, on the first and third Thursday of month. James Lyon, 78 Slannan Road, Falkirk FK1 5NF.

Fife Computer Users Club meets fortnightly. Murray Simpson, 31 Tom Steward Lane, St Andrews, Fife, KY16 8YB.

Grampian Amateur Computer Society meets at 35 Thistle Lane, Aberdeen, on the second and fourth Monday every month at 7.30pm. 15 The Glebe, Kemnay, Inverurie, Aberdeen.

Inverness Personal Computing Club meets every second Tuesday at 7.30pm. Giff Mackenzie, 38 Ardconnell Street, Inverness IV2 3EX, 0463 22099.

Porth & District Amateur Computer Society meets at Hunters Lodge Motel, Bankfoot, on the third Tuesday of month at 7.30pm. Alastair McPherson, 154 Oakbank Road, Perth PH1 1HA.

Strathclyde Computer Club meets at Wolfson Centre, 106 Renfrew Way, Glasgow, on the third Wednesday of month. B Duffy, 24 Lomond Drive, Condorrat, Cumbernauld G4 8NW.

WALES

Abergele Computer Club meets at Abergele C.I. Offices every Thursday at 7.30-10.10pm. J. Jones, 77 Millbank Road, Rhyll, Cwyd.

Colwyn Computer Club meets at the Greens Hotel, Colwyn Bay, at 7pm. Contact D Bevan, c/o Abergele Road, Colwyn Bay, Gwynedd LL29 7PA.

Connaught Computer Club. Meets second and fourth Thursday of each month at the Community Centre, Cable Street, Connaught Quay, at 7pm. Contact G Johnson, tel: Deeside 821945.

Gwent Amateur Computer Club meets at St Mary's Institute, Stow Hill, Thursday at 7.30pm. Roderic Harris, 16 Albrook Avenue, Newport, Gwent NP23 6JG.

Llantwit Major Computer Club. Meets at Adult Education Centre, Llantwit Major, every Tuesday. Contact Douglas Mountain, 16 Denbigh Drive, Llantwit Major, South Glamorgan CF35 9GQ.

Mold Computer Club. Meets 7.30pm on first and third Thursday of each month at the Daniel Owen Centre, Earl Street, Mold. Contact G Johnson, 18 Daylana Drive, Northop Hall, Mold, Cwyd, Wales. Tel: Deeside 821945.

Millford Central Computer Club. Open to schoolchildren, meets every lunch hour and evening. Contact Harry Evans, Millford Central School, Prioryville, Millford Haven, Dyfed. 043 784 571.

Pencad Amateur Computer Club meets fortnightly on Saturdays at Pencad Welfare Hall. Philip Williams, 38 Bryn Rhedyn, Pencad, Bridgend, Mid Glamorgan CF35 6TL, 0656 860307.

Portsmouth Computer Club meets at The Settlement, Roachhill Road, Porton, Porthcawl, Gwent. Contact Graham Lowrie, on Porton 2827.

Swansea & Southwest Wales Amateur Computer Club meets on the last Friday every month. Paul Griffiths, 1 Prescelli Road, Penlan, Swansea SA5 8AF.

Swansea Computer Club. Meets at No 10 (pub), Union Street every Tuesday at 7.30pm. Contact Robert Palmer, 044 123 602.

Wrexham & District Computer Club. Meets each Thursday. Contact Mike Houghton, 1 Snerwell Avenue, Wrexham, Cwyd, Wales.

NORTHERN IRELAND

North Down Micro Users Club. Meets at Bangor Central Library, Hamilton Road, every fourth Monday. Contact A Robson, 0247 67060.

AMAZING LEISUREBASE OPENING OFFERS

To launch our new microcomputer group with a bang we're making available these specially selected products at truly amazing prices. Stocks are in some cases strictly limited and we urge you to call into your local Leisurebase store without delay to avoid disappointment.

COLOUR GENIE



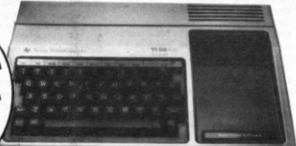
A great 'All Rounder' and deservedly popular. Features include: 16K Ram Expandable to 32K; 16K Rom; Sophisticated high resolution 16 Colour Graphics; 3 Sound generation channels with full 8 Octave Range; De bugging editing facility.

ONLY

99.99
was 194.00

SENSATIONAL
OFFERS
LOWEST
PRICES
EVER!

TEXAS 99/4A



Super 'User Friendly' Micro that is simple to use and is expandable as your interest grows. Features include: Internal 26K Rom Memory; 16K Ram Expandable to 48K; Controllable 5 Octave 3 simultaneous tone sound, plus noise generator; 16 Colour Graphics.

ONLY

99.99
was 134.99

VIC 20 Complete Starter Pack



A complete computer system in one box. Includes VIC 20 computer, cassette unit, introduction to BASIC and four games programmes. **ONLY 134.99** was 139.99.

Special Offers on Peripherals

Spectravision Quick Shot Joysticks for Atari & Commodore **ONLY 11.99**. Daytel joystick interface for Spectrum **ONLY 12.99**. Benkson TRC6 Cassette Recorder fits computers with standard jack socket. **ONLY 29.99**.

New low prices on Texas Software Cartridges

VIC CHESS	34.99	HUNT THE WUMPUS	14.99
ATTACK	14.99	BLASTO	11.99
TOMBSTONE CITY	14.99	TI INVADERS	19.99
CAR WARS	19.99	ALPINE	24.99
MUNCHMAN	29.99	CHISHOLM TRAIL	19.99
PARSAC	29.99	ADVENTURE	24.99
ADVENTURE (CASS.)	EACH 14.99	EARLY LEARNING FUN	14.99
NUMBER MAGIC	14.99	ADDITION/SUBTRACTION 1	19.99
MULTIPLICATION	19.99	ALLIGATOR MIX	24.99
DRAGON MIX	24.99	METEOR MULTIPLICATION	24.99
PROG. LANGUAGE EXTENDED BASIC	69.99	MINI MEMORY	69.99

Your local Leisurebase dealers

BASILDON Godfrey Photographic 4-5 Landon Main Centre, Landon Tel: 0268 416747	CREWE Crews Camera Exchange Leisurebase 14 Causewayhead Tel: 0736 4407	PENZANCE Leisurebase 14 Causewayhead Tel: 0736 4407	SOUTHERD Patience Ltd 9 Queens Rd Tel: 0702 49547
BELFAST A/M Studios 337 Newtownards Rd Tel: 0232 59710	HENLEY ON THAMES G Bushell & Son 37 Hart St Tel: 04912 2363	PLYMOUTH Leisurebase In-store at Dingles Royal Parade Tel: 0752 670505	SWANSEA Leisurebase 218 219 Oxford St Tel: 0792 476099
BIRMINGHAM Leisurebase 28 South Mall Birmingham Shopping Centre (Next to Asda) Tel: 021 643 0388	HEREFORD Photo-Video 9 St Peters St Tel: 0432 67997	PRESTON Channel 8 Software 51 Fishergate Tel: 0772 53057	SUNDERLAND Saxons (Photomarket & Hi-Fi) Ltd 20-22 Waterloo Place Tel: 0783 657578
BRADFORD Photovision 18 Cheapside Tel: 0274 308598	KINGSTON-UPON-THAMES The Computer Shop 91 Acre Road Tel: 01-546 3793	SHEFFIELD Leisurebase 1 Charter Sq Tel: 0742 25354	WESTON Leisurebase 197B High Rd (opp Argus) Tel: 01903 0587
CARDIFF Leisurebase 13/15 Morgan Arcade Tel: 0222 394182	LINCOLN Leisurebase 352 High St Tel: 0522 22248	SHREWSBURY Shrewsbury Camera Exchange The Maltings, Roushill Tel: 0743 4964	SUPER-MARE Leisurebase 5 Waterloo St Tel: 0934 24364
CHELMSFORD Godfrey's Photomarket 54 High St Tel: 0265 355230	LIVERPOOL In-store at Blackers Department Store 16-26 Elliot Street MANCHESTER Chester Camera Centre Moseley Arcade, Piccadilly Plaza Tel: 061 236 5819	STOCKPORT Stockport Camera Exchange 76 Princess St Tel: 061 477 7041	WORKSOP B&B Computers 11 Carlton Rd Tel: 0909 486251
CHESTER Chester Camera Centre 9 Bridge Street Row Tel: 0244 26531		SOUTHAMPTON Leisurebase 19 East St Tel: 0703 38753	

ATTENTION ALL DEALERS

For details of Britain's newest & brightest Computer Franchise Group contact Erica Woodhouse on 0279 58771 or write in strictest confidence to: Leisurebase, Unit 9, Rayham Road Industrial Estate, Bishops Cleeve, Here's. Each new dealer will be allotted an exclusive territory & we urge you to contact us now!

THE COMPUTER CENTRE FOR ALL THE FAMILY

LEISUREBASE

DATABASICS

PON Databasics is presented in three-week cycles. This week it's the turn of software packages, next week hardware, and two weeks from now, peripherals. We can't fit all software packages in, so we've compiled a selection, giving best sellers from 100 publishers and distributors.

We confined coverage to five main types of applications: business, education, games, home and family, and the arts and leisure. And the software is available. Companies are invited to add their best-selling software to the database, or waiting to update information already here, should send details to: Databasics, Personal

Computer News, VNU, 62 Oxford Street, London W1A 2HG.

PRICE includes VAT.

APPLICATION Each software package is listed alphabetically by its application.

SOFTWARE The software is available on which the best selling packages runs.

OTHER VERSIONS Indicates whether or not the package runs on a different machine or operating system.

OTHER VERSIONS Indicates in what format the package comes — either cassette, disk, or cartridge.

MAIL ORDER AVAILABLE tells you whether or not the package is available by mail.

HARDWARE REQUIRED shows the need for special hardware, such as disk drive, joystick or interface.

PUBLISHER DISTRIBUTOR This code refers to the distributor code table at the end of the issue.

Comments will give the name and telephone number of the publisher/distributor.

COMMENTS — any other points of interest.

SOFTWARE

	Price inc. VAT	Machine/Operating System	Other versions	Title	Memory required	Media supplied	Cartridge	Disk	Mail order avail.	Disk drive	Joystick	Other	Publisher	Comments
Accounting	£3,320	Apple II	●	Financial Controller	48K	●	●	●	●	●	●	●	S1	Also on Apple IIE. 8 modules (£402.50 each) — sales, purchase, invoicing, etc.
	£339.25	Apple II	●	General Ledger	48K	●	●	●	●	●	●	●	C1	Supports 1000 accounts and 100 analyses. Self-balancing, full audit trail.
	£352	Apple II	●	Informex Integrated Accounting System	48K	●	●	●	●	●	●	●	I1	Contains nominal, sales, purchase ledger + VAT. Can handle 800 accounts.
	£1,147.70	Apple II	●	Informex Integrated Business System	48K	●	●	●	●	●	●	●	I1	Contains accounting system modules plus invoicing + stock.
	£172.50	Apple II	●	Micro-General Ledger	48K	●	●	●	●	●	●	●	G1	Also on ITT 3030 and Basis 108. Goes through profits/loss + balance sheets.
	£402.50	Apple II	●	Nominal Ledger	64K	●	●	●	●	●	●	●	J1	Also on Sirius, IBM PC, Apple III + UCSD. Requires 132 column printer.
	£431.25	Apple II	●	Payroll	48K	●	●	●	●	●	●	●	J1	Supports weekly, monthly, + per month. Up to 350 employees per disk.
	£402.50	Apple II	●	Purchase Accounting & Cost Control	64K	●	●	●	●	●	●	●	J1	Requires 132 column printer, also Sirius, IBM PC, Apple III, UCSD.
	£402.50	Apple II	●	Sales Accounting System	64K	●	●	●	●	●	●	●	J1	Also on Sirius, IBM PC, UCSD. Provides conventional ledger.
	£339.25	Apple II	●	Sales Ledger	48K	●	●	●	●	●	●	●	C1	Supports 700 + accounts. Direct posting, credit control & 100 analyses, self balancing.
	£1,725	Commodore 8000	●	Auditman	32K	●	●	●	●	●	●	●	C4	Also on Commodore 4000. Complete accounts production system.
	£2,052.75	Commodore 8000	●	Data-Lex	32K	●	●	●	●	●	●	●	D1	Designed for solicitors + others who need to separate office & client's accounts.
	£2,070	Commodore 8000	●	Microflex	32K	●	●	●	●	●	●	●	M1	Also on Commodore 700, Victor & Sirius. £345 per module. Integrated accounting.
	£454.25	Commodore 8000	●	Micro-implax	32K	●	●	●	●	●	●	●	M2	Also on Commodore 64 (£172.50). Needs printer. For smaller retail business.
	£2,360	Commodore 4000	●	Pegasus Integrated Accounting Suite	32K	●	●	●	●	●	●	●	P3	Also on MS-DOS (128K). Contains six stand alone modules.
	£116.00	CP/M	●	CalcStar 1.4	160K	●	●	●	●	●	●	●	M10	Also on IBM PC, MS-DOS. Integrates with WordStar and InfoStar.
	£1,437.50	CP/M	●	Aurora Integrated Accounting Package	64K	●	●	●	●	●	●	●	G1	Seven stand alone modules. Sales, invoicing, purchase, nominal and stock.
	£2,760	CP/M	●	Boiss	64K	●	●	●	●	●	●	●	F1	Also on CP/M-86 and MS-DOS. Amalgamation of sales, purchase & nominal ledger.
	£905	CP/M	●	Cash Book Accounting	64K	●	●	●	●	●	●	●	S2	Also on CP/M-86 and MS-DOS. £575.00 per module. Works with dBase III.
	£2,300.00	CP/M	●	dBFlex	48K	●	●	●	●	●	●	●	E1	Open item six module accounting system. (£575.00) per module. Works with dBase III.
Business Control	£402.50	CP/M	●	Exact	48K	●	●	●	●	●	●	●	S3	Also on MS-DOS. Includes six modules — invoicing, ledgers, stock and payroll.
	£1,840	CP/M	●	ISBS-S	48K	●	●	●	●	●	●	●	G2	Also on CP/M-86. Contains seven modules.
	£2,271.25	CP/M	●	Multi-Index	64K	●	●	●	●	●	●	●	B1	Also on CP/M-86. Contains five modules. Sales, nominal, VAT & stock control.
	£569.25	CP/M	●	Nucleus	64K	●	●	●	●	●	●	●	C2	Also on MS-DOS. Disk drives of 280K needed. A program generating system.
	£1,431.75	CP/M	●	Padmade Business Control System	64K	●	●	●	●	●	●	●	P2	Five modules (£286.35 per module). Nominal, sales, purchase, invoicing, stock.
	£1,980	CP/M	●	Motor Dealers Part Distribution	64K	●	●	●	●	●	●	●	S2	Also on CP/M-86 & MS-DOS. Combines stock control, order processing, ledgers.
	£1,868.75	CP/M	●	Peachtree Basic Accounting Systems	48K	●	●	●	●	●	●	●	P1	Also on CP/M-86 & MS-DOS. Available on hard disk (£2,156.25). 5 stand alone modules.
	£287.50	CP/M	●	Sales Ledger	64K	●	●	●	●	●	●	●	S2	Also on CP/M-86 and MS-DOS. Flexible ledger system.

BUSINESS

	Price	Ref. no.	Machine/Operating System	Other versions	Notes	Memory required	Media Supported	Other	Interface	Publisher/Distributor	Comments
Agriculture	\$45.42		Sharp M260A	●	Easy VAT	48K	●	●	●	R1	Also on Sharp M260B & M260K. VAT record system.
	£1,150		Apple II		Dairy Package	64K	●	●	●	F2	Available on floppy or hard disk. Files individual cow production, with herd summaries.
	£1,725		Apple II		Financial Management Program	64K	●	●	●	F2	Available on floppy or hard disk. Accounts for farm estate management.
	£1,150		Apple II		Management Program	64K	●	●	●	F2	Available on floppy or hard disk. Monitors individual field activities, budgets, etc.
Bill of Materials	£35		Newbrain		Agricultural Field costings	32K	●	●	●	P8	Field data costings
	£373.75		CP/M		Faustball	60K	●	●	●	T2	Also on MS-DOS & TRS-DOS. Will give parts explosion at 10 levels, 99 items level
Bookkeeper	£56.35		Apple II		Apple Bookkeeper	48K	●	●	●	H1	Needs printer. Keeps petty cash, sales, other business books, sorts, analysis etc.
	£460		Commodore 8000	●	National Building Specifications	32K	●	●	●	C3	Also on Commodore 4000. Used with Wordcraft. Produces building specifications.
	£471.50		16-bit machines		Micro-Graphpower	128	●	●	●	I2	Needs printer. Business graphics which plots business data.
Business Graphics	£120.75		Apple III	●	Business Graphics	48K	●	●	●	P6	Also on Apple II (E125.35). Supports range of plotters & pie-charts, etc.
	£149.50		IBM PC	●	Graph Magic	96K	●	●	●	F1	Also on Apple II (E125.35). Displays files graphically. Reviewed 18.3.83.
	£569.25		Commodore 8000		The Administrator	96K	●	●	●	S11	Complete applications generator. No programming required.
Business Management	\$4,140		CP/M		Peachtree Business Management System	48K	●	●	●	P1	Also on MP/M & Unix. Available on hard disk (£6,900). Six modules for single user.
	£684.25		IBM PC	●	Tomorrow's Office	128K	●	●	●	S11	Also on Sirius, Victor & MSDOS. Complete applications generator.
Cash Book	£224.25		Commodore 4000	●	Electronic Cash Book	32K	●	●	●	D1	Also on Commodore 8000 & 64. For small business or add-on products.
	£45.00		Apple II		Floppy Call	48K	●	●	●	P8	Enables user to catalogue & store all information.
Estate Agents	£35.00		Newbrain		Dentists NHS Schedule	32K	●	●	●	P4	Aid for checking statutory returns.
	£1,092.50		Apple II		Commercial Agency Systems	48K	●	●	●	C7	Matches in both directions with lists, labels and letters.
	£377.50		Apple II	●	Cydepress Clients Recoverable Costs	48K	●	●	●	C7	Also on Fair Black Box. Designed to keep record of incurred expenditures.
Financial Accounting	£1,121.00		Apple II		Cydepress Residential System	48K	●	●	●	C7	Also on Fair Black Box. An applicant & property matching system.
	£419.75		CP/M		Estate Agents Match & Mail	56K	●	●	●	S4	Matches & prints out potential customers for every property.
	£569.25		Commodore 8000		Finplan	32K	●	●	●	M3	Also on Commodore 3, 4, & 8000. Vis-20 and Commodore 64. £46.57 on floppy disk.
Financial Planning	£287.50		Commodore 8096		The Financial Director	96K	●	●	●	D1	Designed to handle large & complex planning & financial applications.
	£44.85		Commodore Pet		BuCalc	16K	●	●	●	S5	Also on Hylac & ICL PC. 96K version available. Helps decide on financial strategy.
Financial Reporting	£186.60		Apple II	●	VisCalc	48K	●	●	●	R1	Also on Apple III. Commodore & IBM PC, etc. The classic spreadsheet.
	£345.00		CP/M		Bottom-Line Strategist	48K	●	●	●	P4	A business project forecasting program. Allows user to test business assumptions.
	£454.25		CP/M		Fasplan	64K	●	●	●	C5	Needs double density disks. A file based modelling system for business planners.
Financial Systems	£281.75		CP/M	●	Master Planner	64K	●	●	●	C5	Also on MS-DOS & CP/M 86. Needs 80 column printer. Upgrade of a spreadsheet.
	£396.75		CP/M		Micro Plan	64K	●	●	●	B1	Also on MP/M. Spreadsheet financial planner.
	£343.85		CP/M		Minimodel Financial Modelling	48K	●	●	●	G1	Needs 80 column screen. Model consolidation facility, colour option.
Financial Tools	£182.85		CP/M		Multi-Plan	48K	●	●	●	P4	Also on PC-DOS, Comux, Fortuna, Sirius & Sirius. Second generation spreadsheet.
	£44.85		CP/M		Plannercalc	64K	●	●	●	C5	Needs 80 column screen. Entry level system for spreadsheet planning.
	£218.50		CP/M		SP2020	48K	●	●	●	G2	Forecast effects of proposed actions. Aid to management decision-making.
Insurance Accounting	£172.50		CP/M		Supercalc	128K	●	●	●	A1	Electronic worksheet, representing a large flexible accounting work pad.
	£212.75		CP/M		Super Calculator	48K	●	●	●	E1	Spreadsheet calculator.
	£178.25		CP/M		T-Maker	48K	●	●	●	L1	Utility for analysis & presentation of numerical data & test material.
Insurance Broking	£224.25		MS-DOS		Pulsar Business System	128K	●	●	●	A1	Consists of eight integrated packages & provides commercial accounting functions.
	£339.25		Osborne	●	PADA/C	64K	●	●	●	P2	Also on CP/M. Two systems. Incomplete records accounting, time cost recording.
	£932.50		UCSD-P System		Micro-Finesse	128K	●	●	●	P5	Financial modelling program for businessmen.
Industrial Costing	£741.75		UCSD-P System		Micro-Modeller	48K	●	●	●	I2	Also on CP/M & MS-DOS. Designed for large corporations.
	£747.50		Apple II		Stock & Production Costing	48K	●	●	●	A2	Also on Apple IIe & III & Sirius. Available on hard disk. Needs Pascal system.
	£1,390		Commodore 4000		Insurance Man	32K	●	●	●	C4	Also on Commodore 8000, provides insurance broker with sales ledger.
Integrated Software	£5,462.50		ICL DR520		HS-100	64K	●	●	●	H2	Requires 16 or 27 Mb hard disk to run off. Maintains client & policy records.
	£569.25		IBM PC		Context MBA	256K	●	●	●	B2	Also on Sirius & Victor. Comprises word processor database management system.
	£908.50		Commodore 8000	●	Silicon Office	256K	●	●	●	F1	Integrated spreadsheet, graphics, WP, database & communications.
Linear Programming	£373.75		CP/M	●	Optimiser	48K	●	●	●	C6	Also on Apple. Management tool for optimizing the deployment of scarce resources.
Local Authority	£862.50		Commodore 8000		P.U.S.W.A.	96K	●	●	●	M3	Also on Hylac. Monitors road holes under Public Utilities Street Work Act (1950).
Mailing	£66.25		CP/M		Mailing List	56K	●	●	●	S4	Works with Super file. Prints labels, files, names & addresses. Mail merge facility.
	£149.00		CP/M	●	Mail Merge	56K	●	●	●	M10	Also on IBM PC. MS-DOS. Integrated with WordStar.

Management	£226.16	CP/M	●	Scratch Pad 3.0	48K	●	●	●	●	M4	Also on CP/M 86, MS-DOS & PC-DOS. Spreadsheet using virtual memory.
Mathematics	£28.75	Commodore Pet	●	Infinite Arithmetic	16K	●	●	●	●	S5	Also on Commodore 3000, 4000 & 8000. Available on floppy disk.
Medical	£517.50	Apple II	●	Medical System	48K	●	●	●	●	A2	Also on Apple IIe, III & Sirius (£573.85). On hard disk. Age/sex register.
Office Information	£402.50	Apple II	●	Prophet II	48K	●	●	●	●	A4	Also on IBM PC & Corvus Concept. Information system which acts as a noticeboard.
Payroll	£69.00	Apple II	●	Payroll	48K	●	●	●	●	H1	Also available as cassette for Spectrum ZX81 (£25.00). Needs printer.
	£287.50	Apple II	●	Tab's Payroll	48K	●	●	●	●	T3	Also on CP/M & MS-DOS (64K). Up to 2000 employees, nine pay schemes.
	£977.50	CP/M	●	Powerday	48K	●	●	●	●	O2	Also on MP/M and MS-DOS. Integrates with Omicrons nominal ledger. Handles SSP
Production Control	£2.645	CP/M, MP/M	●	Modular Production System	48K	●	●	●	●	B4	Stock control, bill of materials, etc, flexible reporting, audit trails, etc.
Project Management	£747.00	IBM PC	●	Micronet	48K	●	●	●	●	T2	Also on ICL PC, Sirius, Superbrain, Apple II, & others. Critical path analysis.
Project Planning	£1,150.00	Commodore 8000	●	Hornet	32K	●	●	●	●	C3	Has eight optional variants (all eight £4,025). Network logic & variety of screen display.
Property Management	£517.50	Apple II	●	Property Management System	48K	●	●	●	●	A2	Also on Apple III, Apple IIe & Sirius. Prints rent reminders, demands etc.
Purchase Ledger	£287.50	Apple II	●	Tab's Purchase Ledger	48K	●	●	●	●	T3	Also on CP/M & MS-DOS (64K). Open item ledger — automatic payment facility, etc.
	£805.00	CP/M	●	Powerbought	48K	●	●	●	●	O2	Also on MP/M & MS-DOS. Integrates with Omicron's Nominal Ledger System.
Sales Ledger	£287.50	Apple II	●	Tab's Sales Ledger	48K	●	●	●	●	T3	Also on CP/M & MS-DOS. Part of integrated system. 300 analysis codes.
	£805.00	CP/M	●	Powersales	48K	●	●	●	●	O2	Also on MP/M & MS-DOS. Multi-user system based on mainframe software.
	£325	DEC Rainbow 100	●	Sales Ledger System	64K	●	●	●	●	D2	Also on DEC Mate II. Invoicing & monthly statement generating system.
Sales Order Processing	£805.00	CP/M	●	Compact Sales Order Processing	64K	●	●	●	●	C2	Also on CP/M 80, 86 & MS-DOS. Comes on hard disk. Control, stock, ledgers.
Sales, Purchase, Nominal Ledger	£1,207.50	CP/M	●	Compact Sales, Purchase & Nominal Ledger	64K	●	●	●	●	C2	Also on CP/M 80, 86 & MS-DOS. Follows standard accounting procedures.
Sick Pay	£80.50	Apple II	●	Statutory Sick Pay (SSP)	48K	●	●	●	●	H1	Also on Spectrum. Does all SSP calculations.
Statistics	£172.50	Apple II	●	Inter-Stat	48K	●	●	●	●	G1	Also on Basis 108 & ITT 3030. Needs printer.
	£287.50	Commodore Pet	●	Statistical Package for PCs	32K	●	●	●	●	P7	Also on Commodore 64 (two modules at £99 each) & Sirius. Fully interactive.
	£9.20	Sharp MZ80A	●	Statistical Analysis	48K	●	●	●	●	K3	Also on MZ80K. Calculates mean & standard deviation for up to 100 items.
	£15.00	Sinclair ZX81	●	Critical Path Analysis (CPA)	8K	●	●	●	●	H1	Also on Spectrum (16K). Activities entered from arrow diagram. Finds critical path.
	£977.50	UCSD-P System	●	Trend Plot	128K	●	●	●	●	P5	Needs Hewlett Packard plotter. Developed to analyse historical time series data.
Stock Control	£3.289	CP/M	●	M-SIS	48K	●	●	●	●	T2	Stock control system for manufacturing industry.
	£33.92	Newbrain	●	Stock Control 40/4	32K	●	●	●	●	E2	Stores large quantities of stock, accumulates new stock levels & checks stock level
	£25.00	Sinclair Spectrum	●	Stock Control	48K	●	●	●	●	H1	Also ZX81. Fast fwd/add/delete item. Prints complete or selective lists & total value.
	£12.50	Sinclair Spectrum	●	Stock Controller	48K	●	●	●	●	D5	Can be used with or without ZX printer.
Word Processing	£92.00	Apple II	●	Piewriter	48K	●	●	●	●	M5	Needs 80 column card. Allows entry, editing & print formatting of any text type.
	£125.35	Apple II	●	Wordhandler	48K	●	●	●	●	P4	Word processor for the non-professional — minimum Apple system.
	£152.95	Apple III	●	Apple Writer 2	48K	●	●	●	●	H6	Also Apple II. Has word wrap, glossary & word processing language.
	£28.50	BBC Model B	●	Alphabeta	32K	●	●	●	●	P3	Also available on disk. Suitable for home & business.
	£10.50	BBC Model B	●	Word Pro	32K	●	●	●	●	I4	Includes DELETE, INSERT, SAVE, Date etc.
	£90.85	Commodore 64	●	Infomast	64K	●	●	●	●	R2	Combined programmable word processor, Database and calculator.
	£89.00	Commodore 64	●	Paperclip	64K	●	●	●	●	K5	Also Commodore 8000. Compatible with WordPro & SpellPro.
	£488.75	Commodore 8000	●	Wordcraft	32K	●	●	●	●	D1	Also on SuperPet, Sirius 1, IBM PC & CBM 64. Routine correspondence, mailing, etc.
	£51.75	Commodore Pet	●	Papermate +	16K	●	●	●	●	S5	Also on Commodore 64, 3, 4, & 8000. Available on floppy (£53.49).
	£145.00	CP/M	●	Mail Merge	64K	●	●	●	●	X1	Also on CP/M 86 & PC-DOS. An optional MERGE, PRINT, extra for Wordstar.
	£295.00	CP/M	●	WordStar 3.3	56K	●	●	●	●	M10	Also on IBM PC, MS-DOS. Integrates with CalcStar, InfoStar, Mail Merge, SpellStar.
	£287.50	CP/M	●	Peachtext	48K	●	●	●	●	P1	Also MP/M & MS-DOS. Needs high quality printer. Contains proof reader.
	£339.00	CP/M	●	Perfect Writer/Speller	64K	●	●	●	●	S3	Also MS-DOS & Apple DOS. Contains quick reference card.
	£431.25	CP/M	●	Select Word Processing System	64K	●	●	●	●	B1	Also MP/M & PC-DOS. Screen-oriented system.
	£316.25	CP/M	●	Spellbinder	48K	●	●	●	●	E1	Also on Oasis. Word processing & office management system.
	£333.50	CP/M	●	WP2020	48K	●	●	●	●	G2	Menu-driven, machine independent. Set of key-tops provided.
	£225.00	IBM PC	●	Easywriter II	64K	●	●	●	●	X1	Bold face & underscoring on screen. 80,000 word spell checker extra (£43.15).
	£340.40	IBM PC	●	VisiWord	64K	●	●	●	●	R6	Mail merge facility with Visi file.
	£339.25	MS-DOS	●	WordStar	128K	●	●	●	●	A1	Also on CP/M. Needs printer. Complete screen-based WP.
	£40.25	Newbrain	●	Word Processor 40/12	32K	●	●	●	●	E2	Automatic word wrap, editing, saving paragraphs, deleting.
	£325.00	OS9	●	Stylograph	32K	●	●	●	●	S6	Expandable system with modular design.
	£45.42	Sharp MZ80A	●	Wordpro	48K	●	●	●	●	K1	Also on MZ80B+K. Available on disk (£91.94). One of few WP packages for Sharp.
	£49.95	Tandy TRS 80 I	●	AJ Edit	32K	●	●	●	●	M6	Also on Genie I & II. Needs printer.

EDUCATION

Basic Course	£9.95	Texas Instruments 99-4A	●	Beginners Basic Tutor	16K	●	●	●	●	T5	Gives explanations and examples of TI Basic — lets the user try.
	£13.95	Texas Instruments 99-4A	●	Teach Yourself Extended Basic	16K	●	●	●	●	T5	Needs extended Basic module.

	Price	Machine Operating System	Other versions	Title	Memory required	Media Supplied	Media order avail.	Hardware Required	Publisher/Distributor	Comments
Business Game	£9.95	BBC Model A	●	Business Game	16K	32K	●	●	W1	Also on Model B. Two games for economics, business & general studies, teaching.
	£5.95	BBC Model B	●	Intol	32K	32K	●	●	C9	Also on Vic-20. Rule for ten years, overcoming obstacles, e.g. lamine.
	£14.38	Research Machine 380Z	●	Symbols To Moles	31K	31K	●	●	H4	Also on Apple II. Practise using chemical symbols, writing & mole concept.
	£37.89	Apple II	●	Bumble Plot	48K	48K	●	●	P4	A set of five programs for developing graphics and maths skills. For children 8 to 13.
Chemistry	£29.84	Apple II	●	Face Hanger	48K	48K	●	●	P4	Also on IBMPC. Designed for children to learn computer keyboard by building up face.
	£37.89	Apple II	●	Gerardo's Secret	48K	48K	●	●	P4	An educational game to teach logical thinking & planning. For children aged 6-9.
	£9.80	Atari 400	●	Jigsaw Puzzles	16K	16K	●	●	T4	Also on Atari 800. Has 16 puzzles and optional difficulty.
	£9.95	BBC Model B	●	Letters	32K	32K	●	●	C9	Designed for children aged 4-6 & for dyslexic & remedial children.
Children	£9.95	BBC Model B	●	Merrics	32K	32K	●	●	C9	Also on Vic-20+. Spectrum. Structure of metric system, for children aged 10-15.
	£5.95	BBC Model B	●	Pascal	32K	32K	●	●	C9	Also on Vic-20. Shows construction of Pascal Triangle and tests on it.
	£5.95	BBC Model B	●	Sequences	32K	32K	●	●	C9	Also on Vic-20. Demonstrates number patterns.
	£6.50	BBC Model B	●	The Early Stages	32K	32K	●	●	H4	Reading aid. Plays nursery rhymes. Available on disk.
History	£4.50	BBC Model B	●	Super Hangman	32K	32K	●	●	S9	Version of famous game. High resolution graphics. 800 words or enter own choice.
	£9.95	BBC Model B	●	Tree of Knowledge	32K	32K	●	●	A8	Interactive program teaching categorisation. Simplified information retrieval.
	£4.95	Sharp M260A	●	Giant Maths	32K	32K	●	●	S9	Also on M260K. Big screen figures & humorous error messages. 5 to 11 years.
	£4.95	Sharp M260A	●	Rocket	3K	3K	●	●	K3	Also on M260K. Four difficulty levels. For five to 11 year olds.
Languages	£9.20	Sharp M260A	●	Teach Tables	48K	48K	●	●	K3	Also on M260K. Plays like game that motivates children to improve their ability.
	£4.95	Sharp M260K	●	Master Builder	48K	48K	●	●	S8	Also on M260A. Repair a wall using random blocks. Teaches spacing.
	£5.25	Spectrum	●	Alphabet	48K	48K	●	●	W2	Picture for each letter of the alphabet. Option for lower case. Aimed at ages 2-6.
	£5.25	Spectrum	●	Adding and Subtracting	16K	16K	●	●	W2	For children aged 3-7. Three animated programs with full graphics.
Classroom Monitor	£322.00	UCSD-P	●	Classroom Monitor	64K	64K	●	●	K4	Also on Apple II. Provides demonstration facilities & monitors student's progress.
Economics	£28.75	Sharp M260K	●	Broadwater Economics Simulation	16K	16K	●	●	W1	Also on Commodore Pet & BBC. Simulates micro & macro economics.
	£14.38	Research Machine 380Z	●	Rapondaz	31K	31K	●	●	H4	Also on Apple II. Practising French verb formation (present tense).
	£9.20	Sharp M260A	●	French Conjugate	48K	48K	●	●	K1	Also on M260K. Automatically conjugates regular verbs into tenses.
	£9.20	Sharp M260A	●	French Verbs	48K	48K	●	●	K1	Also on M260K. Allows user to input up to 20 verbs & eight tenses at a time.
Graphics	£9.95	BBC Model B	●	Painter	32K	32K	●	●	A5	Also on Spectrum (£5.75). Atom (£6.90) & on disk.
	£8.00	BBC Model B	●	Creative Graphics	16K	16K	●	●	A9	Book available (£7.50). Designed to illustrate BBC graphics.
	£20.13	Sharp M260A	●	Kings & Queens	48K	48K	●	●	K1	Also on M260K. Facts & figures on English monarchs since 1066.
	£7.95	Sharp M260A	●	Mulligust	3K	3K	●	●	S8	Also on M260K. A language tutor to suit all European languages.
Mathematics	£8.95	BBC Model B	●	Angle	32K	32K	●	●	C9	Also on Spectrum. Includes four programs designed to teach simple geometry.
	£9.95	BBC Model A	●	Algebraic Manipulations	16K	16K	●	●	W1	Also on Model B. Includes four programs designed for use in maths teaching.
	£82.80	IBM PC	●	Fact Track	64K	64K	●	●	K3	Learning basic arithmetic. Presents simple two-line sums in random order.
	£48.00	Sharp M260A	●	Curve Fitting	48K	48K	●	●	K3	Also on M260K. Calculates intercepts & plots power curve.
Meteorology	£9.20	Sharp M260A	●	Decided Numbers	48K	48K	●	●	K3	Also on M260K. Teaches difficult mathematical functions.
	£9.20	Sharp M260A	●	Divisor Advisor	48K	48K	●	●	K3	Also on M260K. Teaches division at a variety of skill levels.
	£27.60	Sharp M260A	●	Numerical Integration	48K	48K	●	●	W2	Also on M260K & B. Teaches Simpson's Rule.
	£5.25	Spectrum	●	Counting	16K	16K	●	●	H4	Graded programs. Good as a first introduction to numbers. Aimed at ages 3-6.
Morse Code	£23.00	Research Machines 380Z	●	Weather	31K	31K	●	●	H4	Also on Apple II. Gives synoptic charts. Teaches elementary meteorology.
	£9.20	Sharp M260A	●	Morse Tutor	48K	48K	●	●	H4	Also on M260K. Used to teach morse code by sight and sound. At seven levels.
	£14.38	Research Machines 380Z	●	Lenses	31K	31K	●	●	H4	Also on Apple II. Illustrates formation of images by lenses using ray diagrams.
	£9.20	Sharp M260A	●	Casino Chips	48K	48K	●	●	K3	Also on M260K. Uses radioactive chips to teach half-life concept.
Typing	£28.75	CPM	●	Touch'n Go	48K	48K	●	●	C6	Also on MS-DOS. Typing tutor for mastering numeric pad & Qwerty keyboard.
	£31.05	IBM PC	●	Typing Tutor	64K	64K	●	●	I3	Presents exercises for learning touch typing or for improving existing skills.
Adventure	£17.95	Atari	●	Arrow of Death	16K	16K	●	●	C8	Also runs on TRS-80, BBC, Vic-20. A classic text adventure.
	£7.99	BBC Model B	●	Adventure	16K	16K	●	●	M7	Also runs on Atom. Many rooms to explore and many hazards to overcome.
	£9.95	BBC Model B	●	Philosopher's Quest	16K	16K	●	●	W1	'Progress through a world of fendish puzzles.'
	£9.95	BBC Model B	●	Sphinx	16K	16K	●	●	W1	'A classic adventure, moving through caves avoiding hazards to collect treasure.'
Commodore Pet	£13.80	Commodore Pet	●	Hitch-Hikers Guide to the Galaxy	32K	32K	●	●	S5	Also runs on Commodore 64, Vic-20, 3000, 4000, 8000. Involved, 'tantalizing'.
	£18.40	Commodore Pet	●	Pythonesque	32K	32K	●	●	S5	Increasingly difficult textual game based on Monty Python. Disk available (£20.12).
	£24.99	Commodore Vic-20	●	River Rescue	8K	8K	●	●	T4	Needs joystick. 'Captain boat through treacherous rivers to rescue explorers'.

GAMES

	£8.00	Dragon 32		Escape	32K	●	●	●	●	M12	Needs joystick. 'A 3D maze game. Get clues from 15 rooms for code of elevator'.
	£8.00	Dragon 32		Flipper	32K	●	●	●	●	M12	'A game of intrigue and strategy. Requires an agile mind and a lot of fore-thought'.
	£8.00	Dragon 32		Mansion Adventure	32K	●	●	●	●	M12	'Wind your way through an old mansion picking up clues to find the diamond'.
	£7.95	Dragon 32		Wizard War	32K	●	●	●	●	S7	Needs joystick. 'Magical combat for two to nine players; interactive duel'.
	£35.00	IBM PC		Adventure in Serema	64K	●	●	●	●	I3	Needs colour graphics adaptor and direct drive colour monitor for use.
	£6.90	Oric	●	Zodiac	16K	●	●	●	●	A5	Also runs on Atom. 'A thinking persons adventure game'.
	£12.07	Sharp MZ80A	●	Adventure	48K	●	●	●	●	K1	Also runs on Sharp MZ80B and MZ80K. 'An interactive adventure game'.
	£12.07	Sharp MZ80A	●	Quest	48K	●	●	●	●	K1	Also runs on Sharp MZ80B and MZ80K. 'Dungeons & Dragons type game'.
	£7.95	Sharp MZ80K	●	Nightmare Park	48K	●	●	●	●	S8	Also runs on MZ80A. 'Cross Nightmare Park. Every few steps play game or task'.
	£7.95	Sharp MZ80K	●	Tombs of Karnak	48K	●	●	●	●	S8	Also runs on MZ80A. 'Bargain for items required before entering tombs'.
	£5.95	Spectrum	●	Faust Folly	16K	●	●	●	●	A6	'A 16K adventure with the same traps, magic, fiends, treasure as the 48K game'.
	£14.95	Spectrum	●	The Hobbit	48K	●	●	●	●	M8	'Object is to get treasure. For one player. Can instruct computer in ordinary English'.
	£5.00	Spectrum	●	Orb	16K	●	●	●	●	I5	Also runs on Dragon 32 and Commodore Vic-20. 'Explore labyrinth and destroy Orb'.
	£10.00	Spectrum	●	Pimania	48K	●	●	●	●	A7	Also runs on Sinclair ZX81, BBC 13, Dragon 32. Reviewed 18.3.83.
	£5.00	Spectrum	●	The Quest	48K	●	●	●	●	I5	Also runs on Dragon 32. 'Fighting adventure game'.
	£5.00	Spectrum	●	Star Trek	48K	●	●	●	●	I5	Also runs on Dragon 32 and Commodore Vic-20. 'Hunt down the Klingon in space'.
	£5.95	Spectrum	●	Slippery Sid	16K	●	●	●	●	S9	Needs joystick and keyboard to use. 'Snake type game'.
	£10.06	Tandy TRS-80 I	●	Mysterious Adventurer	16K	●	●	●	●	M6	Also runs on Tandy TRS-80 III, Genie I, II, Colour Genie and BBC B.
	£4.95	Texas Instruments 99/4A		Forbidden City	16K	●	●	●	●	A8	'You have to explore a deserted alien city with many hazards on the way'.
	£3.95	Texas Instruments 99/4A		Sorcerers' Castle	16K	●	●	●	●	A8	'You are trying to rescue the captured princess'.
	£7.50	BBC Model B		Atlantis	32K	●	●	●	●	I4	'Guide submarine through caverns & destroy enemy'.
Arcade type	£9.99	Commodore Vic-20		Night Crawler	5K	●	●	●	●	R2	'A Centipede style game. Fast action, graphics and sound effects'.
	£5.50	Spectrum	●	Arcadia	16K	●	●	●	●	I6	Also on Commodore Vic-20. '12 levels of aliens attacking in different ways'.
	£5.95	Spectrum	●	Ground Attack	16K	●	●	●	●	S9	'Variable speeds allows this game to be played by everyone'.
	£3.95	Texas Instruments 99/4A		Bomber	16K	●	●	●	●	A8	'Must land plane & bomb skyscrapers'.
Asteroids type	£5.95	Spectrum	●	Cyber Rats	16K	●	●	●	●	S9	Needs joystick and keyboard to run.
	£4.95	Spectrum	●	Meteor Storm	16K	●	●	●	●	O1	'Progressive difficulty, variety of controls'.
	£6.95	Spectrum	●	Time-Gate	48K	●	●	●	●	O1	'Time travel. 3D graphics, colour, cockpit view and instrument display'.
	£4.95	ZX81		Asteroids	4K	●	●	●	●	S9	'Fast moving, suitable for all ages'.
Ballooning	£14.95	Atari 400	●	Up Up Away	16K	●	●	●	●	S13	Reviewed in PCN week ending April 29. Also on Atari 800. Available on disk.
Centipede type	£7.99	Dragon 32		Caterpillar	32K	●	●	●	●	M12	'A new generation munching game'.
Chess type	£7.99	BBC Model B		Chess	16K	●	●	●	●	M7	'Machine code, high resolution graphics with many play options'.
	£24.95	Dragon 32		Cyrus Chess	32K	●	●	●	●	D3	'Won European microcomputer chess championship 1981. Nine levels of difficulty'.
	£14.50	Sharp MZ80A	●	Chess	48K	●	●	●	●	K1	Also on Sharp MZ80B & MZ80K. '14 levels of difficulty'.
	£42.95	Texas Instruments 99/4A		Chess	16K	●	●	●	●	T5	'Different difficulty levels. Will solve problems. Can teach chess'.
Darts	£19.99	Atari 400	●	Darts	8K	●	●	●	●	T4	Also on 800. 'Aim & throw — the computer does the arithmetic'.
Defender type	£22.80	Atari 400/800	●	Submarine Commander	16K	●	●	●	●	T4	'One player. Nine levels of difficulty. Destroy shipping. Oxygen levels, fuel etc'.
	£9.95	BBC Model B		Planetoid	32K	●	●	●	●	A9	'A game of speed & skill'. Available on floppy disk (£11.50).
	£7.95	Commodore Vic-20		Alien Blitz	5K	●	●	●	●	A3	Needs joystick to run. 'Difficulty levels, colour & sound'.
	£9.99	Commodore Vic-20		Annihilator	3K	●	●	●	●	R2	'Based on Defender'.
	£6.95	Spectrum	●	Penetrator	48K	●	●	●	●	M8	'Two levels of difficulty difficulty'.
	£21.95	T199/4A		Parsec	16K	●	●	●	●	T5	'Increasingly difficult. After four onslaughts pass through to next stage'.
Flight Simulator	£22.80	Atari 400	●	Jumbo Jet Pilot	16K	●	●	●	●	T4	Also Atari 800. 'Ten difficulty levels. View through cockpit with flight instrumentation'.
	£7.95	Spectrum	●	Flight Simulation	48K	●	●	●	●	S10	Also on ZX81 (£5.95). 'Shows control panel & control view'.
	£17.20	Tandy TRS-80	●	Jumbo	16K	●	●	●	●	M6	Also on Genie I, II & BBC Model B. 'Simulation of piloting a Jumbo'.
Football	£29.99	Atari 400	●	Kick Back	8K	●	●	●	●	T4	Also available on Atari 800. Needs joystick to run. 'Beat the high score'.
	£19.55	Atari 400	●	Soccer	8K	●	●	●	●	T4	Also on Atari 800. 'Aerial view of field'. Reviewed 11.3.83.
Frogger type	£5.50	Commodore Vic-20		Wacky Waiters	3.5K	●	●	●	●	I6	'Waiter serving drinks in hotel. Has to hop from lift to lift'.
	£9.99	Commodore Vic-20		Hopper	3K	●	●	●	●	R2	'A version of Frogger'.
	£5.95	Spectrum	●	Horace Goes Ski-ing	16K	●	●	●	●	S10	'Sequel to Hungry Horace. He must cross busy road, fetch skis & ski down slope'.
Golf	£7.95	Dragon 32		Golf	32K	●	●	●	●	S7	'For one or two players. Full handicapping system'.
	£3.75	Spectrum	●	Golf	16K	●	●	●	●	R3	'For one or two players. Choice of nine or 13 holes'.
	£3.75	Sinclair ZX81		Golf	16K	●	●	●	●	R3	'Similar to other golf games, in black and white'.
Helicopter	£24.95	Commodore Vic-20	●	Chop Lifter	8K	●	●	●	●	A3	Also on Commodore 64. Needs joystick to run. 'Vic version of USA's best-seller'.
Jigsaw	£14.99	Atari 400	●	British Heritage Jigsaw Puzzle	8K	●	●	●	●	T4	Also on Atari 800. 'Educational game with selective difficulty'.
Kong type	£7.95	Commodore Vic-20		Bonzo	8K	●	●	●	●	A3	'Workman dodges robots on split-level. Sound & full graphics'.

Price inc. VAT	Machine/Operating System	Other versions	Title	Media Supplied				Hardware Required			Comments
				Memory required	Cassette	Disk	Cartidge	Multi-order avail.	Joystick	Other	
£8.00	Dragon 32		Donkey King	32K	●	●	●	●	●	M12	Popular arcade game.
£9.95	BBC Model B		Monsters	32K	●	●	●	●	●	W1	'The player has to run up & down ladders & along walls, pursued by monsters'.
£24.95	Dragon 32		Ghost Attack	N/A	●	●	●	●	●	D3	'The aim is to avoid & eliminate ghosts which roam a maze'.
£8.00	Dragon 32		Jerusalem Adventure	32K	●	●	●	●	●	M12	'Aim is to get treasure & avoid being eaten'.
£5.95	Spectrum		Hungry Horace	16K	●	●	●	●	●	S10	'Animated maze game with sound & full graphics'.
£4.95	Spectrum	●	Mined-Out	48K	●	●	●	●	●	Q1	Reviewed in PCN week ending April 22. Also on Dragon 32.
£5.95	Spectrum		Muncher	16K	●	●	●	●	●	S9	'A monster munching marathon'.
£8.00	Spectrum		Magics	16K	●	●	●	●	●	B3	'An increasingly difficult maze game. The object is to fit light bulbs & destroy ghosts'.
£10.00	Sinclair ZX81		Sinclair ZX81	16K	●	●	●	●	●	B3	'Three levels. Find & collect treasure in a maze & escape'.
£9.95	BBC Model B		Shopper	16K	●	●	●	●	●	W1	Based on Pacman.
£9.50	Colour Genie		Chomper	16K	●	●	●	●	●	K2	Based on Pacman.
£8.00	Dragon 32		Scarfman	32K	●	●	●	●	●	M12	Based on Pacman.
£4.95	Spectrum		Guashier	16K	●	●	●	●	●	R3	Joystick optional. Based on Pacman using Bearo characters.
£8.50	BBC Model B		Billards	32K	●	●	●	●	●	H3	Available on disk. 'A game for all ages'.
£7.95	Dragon 32		Grand Prix	32K	●	●	●	●	●	S7	'For one or two players, features eight Grand Prix tracks & 10 levels of difficulty'.
£21.95	Apple II		Car Wars	16K	●	●	●	●	●	T5	'Race through maze whilst avoiding computer controlled car'.
£19.95	Apple II		Lunar Lander	16K	●	●	●	●	●	S12	Reviewed in PCN week ending April 22.
£29.95	Atari 400	●	Claim Jumper	16K	●	●	●	●	●	C8	Also on Atari 800. A two player shoot-out over gold nuggets & cash.
£29.95	Atari 400	●	Shamus	16K	●	●	●	●	●	C9	'Player has to move through air avoiding hazards'.
£5.95	BBC Model B		Invisible Man	32K	●	●	●	●	●	R2	Also on Commodore Vic-20. 'Aim is to shoot man who keeps disappearing'.
£9.99	Commodore Vic-20		Quicker	3K	●	●	●	●	●	A3	'Aim is to shoot down ducks & rabbits on shooting gallery'.
£19.95	Commodore Vic-20		Spiders of Mars	N/A	●	●	●	●	●	A6	'Popular game for the Vic-20. Also on Commodore 64'.
£5.95	Spectrum		High Noon	16K	●	●	●	●	●	S7	'Clean up chaos & disorder in town'.
£9.95	Dragon 32		Dragon Trek	32K	●	●	●	●	●	A6	'A version of Star Trek with ten levels of difficulty'.
£5.95	Spectrum		Android Run	16K	●	●	●	●	●	A6	'Control android to shoot walls, kill mutants & reach central complex'.
£5.95	Spectrum		Cosmos	16K	●	●	●	●	●	I6	'Defend space convoy from aliens & asteroids'.
£5.50	Spectrum		Schrods	16K	●	●	●	●	●	S9	'Space bull-dozer nudges shapes into black hole'.
£5.95	Spectrum		Starship Enterprise	48K	●	●	●	●	●	R3	Based on the classic Star Trek. Includes arcade action.
£4.95	Spectrum	●	Star Trek	48K	●	●	●	●	●	M7	Also on ZX81 (£3.95). 'One player, sound & full colour graphics strategy game'.
£7.99	BBC Model B		Scoop	32K	●	●	●	●	●	R3	'Written in machine code with full colour & high resolution graphics'.
£7.50	BBC Model B		Model B Invaders	32K	●	●	●	●	●	I4	'A Space Invaders game with high resolution & colour graphics'.
£9.99	Commodore Vic-20		Orbit	3K	●	●	●	●	●	R2	Based on Missile Command. 'Fast & colour'.
£19.95	Dragon 32		Cosmic Invaders	N/A	●	●	●	●	●	D3	Joystick optional. '15 levels of difficulty'.
£6.50	Spectrum		Destroyer	16K	●	●	●	●	●	I5	'Destroy the varying alien invaders'.
£4.95	Spectrum		Intruders	16K	●	●	●	●	●	Q1	'Includes mutants, random saucers, bonus base & 14 different aliens. Sound & colour'.
£5.00	Spectrum		Spectral Invaders	16K	●	●	●	●	●	B3	'For one or two players. Increasingly difficult, high resolution colour graphics'.
£21.95	T1 99.4A		Invaders	16K	●	●	●	●	●	T5	Based on Space Invaders. After every two screens a new character appears.
£3.95	Sinclair ZX81		Invaders	4K	●	●	●	●	●	S9	Based on Space Invaders.
£33.35	IBM PC		Decathlon	64K	●	●	●	●	●	I3	'Needs colour graphics adaptor & direct drive colour monitor. For up to six players'.
£7.95	Dragon 32		Wizard War	32K	●	●	●	●	●	S7	Reviewed in PCN week ending April 8.
£5.95	Commodore Vic-20		Innovation Cassette	48K	●	●	●	●	●	M8	One tape containing seven games.
£5.95	Spectrum		Over the Spectrum	16K	●	●	●	●	●	C8	Also on Atari 800. 'Defender to geometry, beginners to advanced'.
£24.95	Atari 400	●	Picnic Paranoia	16K	●	●	●	●	●	M9	'Different levels of skill'.
£29.95	Colour Genie		Breakout	16K	●	●	●	●	●	C8	'Chased by robots in enclosed room. Different levels of difficulty'.
£6.95	Commodore Vic-20		Amok	3K	●	●	●	●	●	T4	'Get men to shore in shortest time'.
£9.95	Commodore Vic-20		Black Squid	3K	●	●	●	●	●	A5	'Protect a powerhouse from mutants. Enter their burrows & destroy eggs'.
£24.95	Commodore Vic-20		Mutant Herd	32K	●	●	●	●	●	A5	'A game for all the family'.
£6.90	Dragon 32		Dead Wood	32K	●	●	●	●	●	A8	'The aim is to retrieve a chalice from a temple'.
£3.95	Texas Instruments 99.4A		Chalice of Kalmar	16K	●	●	●	●	●		
£78.00	Sharp M260A		Cubman	48K	●	●	●	●	●	S8	Golf handicapping and competition results system complying with 1983 regulations

	£24.95	BBC Model B		EDG Graphics Package	32K	●	●	●	S7	Computer aided design package. Reviewed 11.3.83.
	£50.60	CP/M		CP/M Graphics	64K	●	●	●	D4	Range goes up to £421.70 & conforms to GKS Graphics Standard.
Language	£148.75	CP/M	●	CIS Cobol	64K	●	●	●	M11	Also on Unix. Compact, interactive ANSI 74 standard implementation of Cobol.
	£1,099.75	CP/M	●	Level II Cobol	96K	●	●	●	M11	Also on Unix & MS-DOS. High level ANSI 74. Compiler, mainframe-compact code.
	£396.00	CP/M	●	Fortran 80	48K	●	●	●	T2	Useful for scientific applications, where Pascal is inefficient.
	£285.20	CP/M	●	Pascal — MT+	64K	●	●	●	X1	ANSI standard Pascal for Z80 processors. Also on CP/M 86 (£484-90).
	£210	CP/M	●	Supersoft C Compiler	48K	●	●	●	M4	Also on CP/M-86, MS-DOS, PC, DOS. Fast implementation of C.
	£114.43	Commodore 64	●	DTL-Basic Compiler	32K	●	●	●	D1	Also on Commodore 8000, 4000 & 3000. Also tape version on CBM 64 (£39.96).
	£16.85	BBC Model A	●	Lisp on the BBC	16K	●	●	●	W1	Also on BBC Model B. Book available £7.50. Lisp is artificial intelligence language.
	£253.00	CP/M	●	ProPascal	56K	●	●	●	E1	Also on CDOS. Needs two disk drives. Native code Pascal.
	£40.19	Sharp MZ80A	●	Forth	48K	●	●	●	K1	Also on MZ80K & Osborne. Allows implementation of Forth.
	£25	Spectrum	●	Hisoft Pascal	48K	●	●	●	H5	Reviewed in PCN week ending April 8. Pascal compiler and screen editor.
	£421.70	Any 8 or 16 bit machine	●	PL1	48K	●	●	●	D4	A compact implementation based on ANSI standard general purpose subset of PL1.
	£350.75	IBM PC	●	Lattice-C	64K	●	●	●	L1	Also on MS-DOS. C Compiler for 16 bit machines — full implementation & execution
	£172.50	UCSD p-System	●	UCSD Pascal	48K	●	●	●	D4	Portable Pascal for systems development or commercial applications.
Linker	£224.25	CP/M	●	Plink 2	48K	●	●	●	L1	Up to 8 megabytes.
	£59.80	CP/M	●	Operating Guide	48K	●	●	●	E1	Works by putting CP/M to sleep & replacing it with operating environment.
Operating system	£22.94	Apple II	●	Fasdos	48K	●	●	●	P4	Disk operating system for Apples which speeds up location of binary & Applesoft files.
	£277	8086 micro	●	Concurrent CP/M-86	48K	●	●	●	T2	Enables four separate tasks to run in a single user station.
	£431.25	Many processors	●	UCSD p-System	48K	●	●	●	D4	Portable user-friendly operating system including one compiler.
	£295.20	8080 and Z80 micros	●	CP/M+	128K	●	●	●	D4	Upward compatible from CP/M enhanced 8-bit micro. O/S.
	£126.50	8080 and Z80 micros	●	CP/M 2.2	64K	●	●	●	D4	O/S for 8-bit micros with over 1.5 million users.
	£379.50	8080 and Z80 micros	●	MP/M	64K	●	●	●	D4	Multiuser, multitasking. Features record & file locking, date & time stamping etc.
	£210.80	8086 and 8088 micros	●	CP/M-86	64K	●	●	●	D4	Manages up to one megabyte of RAM & allows up to 128 megabytes of on-line storage.
	£548.20	8086 and 8088 micros	●	MP/M-86	64K	●	●	●	D4	Multi-user. Multi-tasking. Multi-user capability with multi-programming for each user
	£168.70	8080, Z80, 8086 and 8088 micros	●	CP/Net	64K	●	●	●	D4	A CP/M compatible O/S designed to access local & networked resources.
	£295.20	Motorola MC68000	●	CP/M 68K	64K	●	●	●	D4	Extends CP/M to Motorola MC68000 microprocessors. Single user, single tasking.
Program Generator	£226.85	Apple II	●	Quickcode	64K	●	●	●	P4	Also on IBM PC. Program generator for DBase II.
	£126.50	CP/M	●	Forms-2	64K	●	●	●	M11	Also for Unix & MS-DOS. Programming tool, for generating Cobol code.
	£379.50	CP/M	●	Last One	64K	●	●	●	S3	Also on MS-DOS and Apple DOS.
Programming Tool	£2,500	Apple II	●	Pascal Isam/Pascal Form	48K	●	●	●	A4	Also on IBM PC & Corvus Concept. Needs Corvus hard disk. Pascal prog tool.
	£287.50	CP/M	●	Fileshare	48K	●	●	●	M11	Also on MP/M. Bank-switched memory or CP/M network.
	£7.95	Dragon 32	●	Dragon Selection 2	32K	●	●	●	D3	Four utility programs which can be listed to see how the program works.
Telex	£2,113.70	Superbrain	●	Micro Telex	64K	●	●	●	E1	Also on Televideo 802. Enables automatic sending-receiving or telex by micro.
Testing Tool	£95.82	CP/M 80	●	Diagnostics II	32K	●	●	●	M4	Also on CP/M-86 and MS-DOS. Tests systems.
Time Recording	£862.50	Commodore 8000	●	Minuteman	32K	●	●	●	C4	Also on Commodore 4000. Time recording system. Can produce range or reports.
	£402.50	CP/M-86	●	Time Recording System	48K	●	●	●	D2	Also on CP/M 80. Control over man/hour expenditure by job or account number.
Utilities	£23.00	Apple II	●	Compute Utilities Disk II	48K	●	●	●	C1	Also on Apple IIe. Error checking, copying. Single disk copy. Label disk.
	£115.00	IBM PC	●	C-Food Smorgasbord	64K	●	●	●	L1	Decimal arithmetic, low level & terminal independent input & output.
	£79.35	CP/M	●	Visa 80	64K	●	●	●	M13	Constructs a menu-driven system to your design.

A1 ACT Pulsar, 021-454 8585 **A2** Advanced Quality Software, Norwich 21117 **A3** Audiogenic, Reading 595647 **A4** Atlantic Software, Nottingham 412777 **A5** A & F Software, 061-223 6206 **A6** Abbex Electronics, 01-203 1465 **A7** Automata UK, Portsmouth 735242 **A8** Apex Trading, Brighton 36894 **A9** Acornsoft, Cambridge 316039
B1 Borsal, 01-580 0902 **B2** Bristol Software Factory, Bristol 23430 **B3** Bug-Byte, 051-227 2299 **B4** Bytesoft, 0480-215005 **B5** Bellflower software, 01-903 1816
C1 Computech Systems, 01-794 0202 **C2** Compact Accounting, Dorking 887373 **C3** Claremont Controls, Rothbury 21081 **C4** Computer Services Midlands, 021-382 4171 **C5** Comshare, 01-222 5665 **C6** Caxton Software, 01-379 6502 **C7** Cydepress, Wellingford 37769 **C8** Channel 8 Software, Preston 53057 **C9** Chalksoft, Wellington 7117 **C10** Construction Computing Systems, Sydeed 47541
D1 Dataview, Colchester 669414 **D2** DEC, Basingstoke 59200 **D3** Dragon Data, Kenfig Hill 744700 **D4** Digital Research, Newbury 35304 **D5** Dipar Software, 0329 46756
E1 Encotel Systems, 01-686 9687 **E2** Elstree Computer Centre, 01-953 6921
F1 Ferrat, 01-751 5791 **F2** Farmplan Computer Systems, Rotherham 64321
G1 Great Northern, Leeds 589980 **G2** Graffcom Systems, 01-727 5561
H1 Hilderbey, 01-485 1059 **H2** Hartford Software Norwich, 781156 **H3** H & H Software, Runcorn 65566 **H4** Heinemann, 01-637 3311 **H5** Hisoft, Swindon 26616
I1 Informex, 01-318 4213 **I2** Intelligence (UK), 01-543 3711 **I3** IBM UK Product Services, Basingstoke 56144 **I4** UK Software, Blackpool 21555 **I5** Impact Software, 031-441 4257 **I6** Imagine Software, 051-236 6849
J1 Janus Systems, Tring 6841
K1 Karma Computers, Maidenhead 71778 **K2** Kansas City Systems, Chesterfield 850357 **K3** Knights, Aberdeen 630526 **K4** Keen

Computers, Nottingham 412777 **K5** Kobra Micro Marketing, Henley-on-Thames 2512
L1 Lifeboat, 01-836 9028
M1 MMS, Bedford 40601 **M2** Microplex, Macclesfield 615000 **M3** McDowell Knaggs & Associates, Worcester 612261 **M4** Micro Technology, Tunbridge Wells 45433 **M5** Micromedia, 01-843 9457 **M6** Molimex, Bexhill-on-Sea 223636 **M7** Micro Power, Leeds 683186 **M8** Melbourne House, 01-977 9160 **M9** Mercury Software, Darwen 776677 **M10** MicroPro, 01-499 5777 **M11** MicroFocus, Swindon 695891 **M12** Microdeal, St Austell 67676 **M13** Mediatech, 01-963 4372
N1 Owl Microcommunications, Bishops Cleeve 67668 **O2** Omicron, 01-636 6575
P1 Peachtree Software International, Maidenhead 32711 **P2** Padmede, Fleet 21892 **P3** Pegasus, Kettering 522822 **P4** Pete & Pam Computers, 01-789 1022 **P5** PE Consulting Group, Egham 34411 **P6** Personal Computers, 01-377 1200 **P7** PTRC, 01-836 2208
P8 Printivity, 02407-4906
Q1 Quicksilver, Southampton 20169
R1 Rapid Terminals, High Wycombe 26271 **R2** Rabbit Software, 01-863 0833 **R3** R & R Software, Gloucester 502819
S1 Systematics International Microsystems, Wetherill 121 **S2** Sosa Software Products, 01-788 7498 **S3** Silicon Valley Trade, 01-242 2807 **S4** Southdata, 01-994 6477 **S5** Supersoft, 01-861 1166 **S6** Seed, Brownhills 378151 **S7** Salamander, Brighton 771942 **S8** Solo Software, Worcester 424152 **S9** Silversoft, 01-748 4125 **S10** Sinclair Research, Cambridge 353204 **S11** Stage One Software, Poole 735650 **S12** SBD Software, 01-870 9275 **S13** Starcade, 051-236 6628 **S14** Iain Stewart, 0259-60840
T2 Tams, Windsor 56747 **T3** Tabs, Andover 5893 **T4** Tarm EMI, 01-836 2444 **T5** Texas Instruments, Bedford 63211
W1 John Wiley & Sons, Chichester 784531 **W2** Wigdit Software, 01-444 5285
X1 Xitan Systems, Southampton 334711

81

MICROSHOP

Rates: £10 per single column cm. Minimum size 3 cm. Series discount available. **Mechanical Data:** Column width, 1 column 57mm. 2 colours 118mm. 3 columns 179mm. **Copy Dates:** 10 days prior to publication.
Contact: Ian Whorley or Christian McCarthy on 01-323 3211.

PSST! £2.00 JET-PAC £2.00 AH-DIDDUMS £2.00 SPECTRES £2.00

ANY ONE OF THESE PROGRAMS CAN BE YOURS FOR ONLY £2.00 + 30p POSTAGE if you join our Software Discount Club (Membership £5.00 per year). We will give you at least 10% discount off all software you buy from us.

We stock a wide range of quality software for a variety of computers, including spectrum, ZX81, Vic 20, Commodore 64, Jupiter Ace and others.

Also coming shortly, a wide range of exclusive "Devonshire House" software for the above machines.

Commodore 64 £256 48K Sinclair Spectrum £129 16K Sinclair Spectrum £99 Jupiter Ace 16+ £55

Contact us now: we are

J & F COMPUTERS, Rosehill, Ladock, Truro, Cornwall. Tel: 0726 882758.

DEVONSHIRE HOUSE, Gylng Street, Falmouth, Cornwall. Tel: 0326 72637.

★ ★ ★ Trade & Dealers enquiries welcome ★ ★ ★

Software

THE TOMB OF DRACULA!



3D HORROR ADVENTURE GAME!

For ZX81 with 16K RAM £3.95

For 48K SPECTRUM £4.95

For the 16K ZX81 or with colour and sound for the 48K SPECTRUM, a superb 3D graphics adventure game! Enter Dracula's tomb at 30 minutes to sunset... wander through the tomb's pre-mapped 300 vaults in search of the fabled Vampire's Treasure... pick up valuable silver stakes and use them to defend yourself against the lurking horrors... ghouls, zombies, pits of primordial slime... See them all on the computer's screen! when it will let you! Take a chance on a Mystery Vault... if you dare! And all the time the minutes are ticking by in sunset... when Dracula rises from his coffin and comes after you!

Price includes ready-to-load cassette with library case and inlay, full instructions, postage and packing. **Order today!** Money refunded if not delighted!

Send cash, P.O. or cheque to:

FELIX SOFTWARE (DEPT. PCN)
 19 Leighton Avenue, Pinner, HA5 3BW.

Member of the Computer Trade Association

Castle Golditz

ESCAPE-OR-DIE ADVENTURE.....!

For ZX81 with 16K RAM £4.95

For 48K SPECTRUM £5.95

You are an Allied POW in the infamous Castle Golditz, Nazi fortress jail for Allied prisoners of war! Can you escape with your life through the vast labyrinth of rooms to the main gate? Tackle brutal Gestapo and SS guards, savage guard-dogs, traps and pitfalls! Survive if you can the Corridor of Rats, the Tunnel of Poisonous Spiders, the Vault of Human Bones and many more! And on your way, grab all the fabulous Nazi loot you can carry!



Software for PET SHARP TEXAS

All programs listed can be written in German or Danish text (except for PET).

TEXAS

Martin Lander

Allen War

Lunar Lander

Space Invaders and Conges

Basic Tutorial Electronics/Digital Techniques

Musical Composition, Morse Code Test

Speech (if required) on most programs using Speech Editor

EDUCATIONAL

Basic Tutorial (2 parts total approx 70K)

Electronics Tutorial (as above) Morse Code Test, Typing Test

Games

Pet Sharp, Jigsaw Puzzle

Variety of Space Games in Thoughts & Crosses (in large graphics)

games being played simultaneously

Three Card Brag, Code Breaker, Vising Castle

UTILITIES

Sortfiles

6502 Dis-Assembler in Basic, Dis-Assembler to Screen or Printer

(Pet only)

We are on Prestel Mailbox (Enterprise 268559565)

Tele ordering details in catalogue.

All programs £4.00 post paid.

AQUARIUS SOFTWARE

10 Kenneth Road, Basildon, Essex SS13 2AT.

Telephone (0268) 559565 (24 hours)

Prestel mailbox. 0268559565

SOFTWARE TO HELP YOU WIN THE POOLS "POOLSWINNER"

The most sophisticated Pools Prediction Aid available. Gives probabilities of score draw, draws, homes or away, based on two databases holding over 20,000 matches (included).
 The databases are automatically updated as results are entered.
 Can be used in simple mode, or with parameter adjustments to develop your own unique forecast method.
 Fully documented, available now for Apple, Spectrum, Dragon, ZX81 (16K) (others - please enquire).
 £15.99 (discs/tapes)

"POOLSDATA"

Complete record of all English Football League matches 1979-83. Teams, scores and dates of 10,000 matches held in simple format, ready for your analysis. Starter analysis programs and full documentation included. Available for Apple, Spectrum, ZX81, Dragon, Commodore series.
 Discs (5 year) £15.99
 Tapes (5 year) £12.50
 Tapes (2 year) £7.50 (plus 50p included)

SELEC SOFTWARE (PCN)

27 Cornhill
 Chichester,
 Chichester,
 01243 7425



NEW! NEW!

"Nanos" quick-reference cards - easier to use than the manuals!

DRAGON-32 £3.95

COMMODORE 64 VIC-20 £3.95

SINCLAIR ZX81 £3.50

"Quick-shot" joysticks - improve your scores!

DRAGON-32 £14.95 + £1

ATARI 400/800 £12.95 + £1

COMMODORE 64 VIC-20 £12.95 p&p

Ask for our full list of products

ELKAN ELECTRONICS (Dept PCN)

FREEPOST, 11 Bury New Road,

Preswich, Manchester M26 6LZ

or telephone: 061-798 7612 (24 hours)

WANTED PERSONAL COMPUTERS

All monies bought for cash
Morgan Camera Company
 180 Tottenham Court Road,
 London W1 Tel: 01-388 2562



LERWICK, SHETLAND

Tel: 0595 2145

Software, Books Accessories
 Service

Acorn Computer, Dragon-32, ZX81,
 Spectrum, VIC-20, CBM-64
 Open Mon-Sat 9.30-5.30

64 BUSINESS USERS

Hardware including super CP80 printers and lots of good software in stock: e.g. Calc Result, Accounts Packages, Visawrite and Spell, Codewriter, Assembler, Monitor, Programming Utilities and WAIT FOR IT - CENTRONICS INTERFACES.

THE COMPUTER CENTRE

17 Bridge Street, Leighton Buzzard, Beds.
 Tel: (0525) 376622 & 382504

ORIC 1

Editor — Assembler — Disassembler

Full 6502 code, plus pseudo ops, labels, arithmetic, and auto branch calculation. Output to screen, printer and cassette £15.

NEWBRAIN

Editor C—dv.1.

Word processor, database, text and basic program editor, full control of all input-output devices on cassette — disk — expanded systems.

CENSOR, RESEQ, EXAMIN.

Can be merged to use with Editor. Complete with instruction manual £25.

Editor A — B

Cassette only, cannot be used with Censor, Reseq, Examin £15.

CENSOR

Basic program syntax modifier, delete nulls and rem statements. Converts variables to lower case. £8.

RESEQUENCE

Re-numbers and re-sequences whole or parts of basic programs, performs a move function with full maintenance of all VEN, RESUME, GOSUB, GOTO directives. Disk — tape compatible £8.

EXAMIN

Analyses basic programs and displays — prints lists of variables, references etc. To use this program correct syntax as produced by Censor is required £8.

DRAGON 32

Word processor — basic program Editor £9.95.

MICROPLOT

19 THE EARLS CROFT
CHEYLESMORE,
COVENTRY

WANTED

HIGH QUALITY SOFTWARE OF ALL TYPES FOR THE VIC, CBM 64 AND SPECTRUM FOR EXPORT AND UK DISTRIBUTION.

COULD YOUR PROGRAM BE No 1 IN:

ISRAEL, NORWAY OR CANADA?

Tel: 0492 49747

or write to:

MR CHIP SOFTWARE

1 NEVILLE PLACE,
LLANDUDNO,
GWYNEDD LL30 3BL

GAMES FOR THE BRAIN

For Newbrain users who cannot get away from it all:

GOLF — select handicap for a graphic round of golf. Features 12 clubs, rough, bunkers, power strokes, out of bounds, automatic score card and random weather conditions, separate fairway and green graphics.

CHAFTS — if you like chess, draughts and othello you'll love chafts — a sophisticated board game of skill and strategy for 2 players. 9 skill levels. 2 methods of winning. Both cassettes with instructions £8.00 each inclusive of p&p and VAT.

Plus a full range of effective business software, including DIRECTORY, DATA BASE, BANK ACCOUNT designed by businessmen for businessmen by **BRAINFORM SOFTWARE**, 35 York Road, Trinity, Edinburgh EH5 3EG.

A TEXT ALTERING ADVENTURE for the (32K) BBC MICRO

More effective than the "I Ching" or the Tarot cards: it changes your mind — completely.

... And in seconds the petri dish of her shell had been heated from the scum of the Milky Way and into the heart of the galaxy of Andromeda.

Make the story go your way. Or play the RUNESMITH game. Join the ancient order. See what grade you reach. Or create your own word-nets to work through.

RUNESMITH comes as a 3-part program, has a 4-line sample with which to experiment 6 text files to make up the complete sci-fi prose-poem, "WYCH HAZEL ON THE PLANET TERROR", exploring which will make you a Runesmith, and 14 pages of documentation.

A totally new concept in software.

For complete pack send a £6.98 cheque or PO for

RUNESMITH

to Abraxas Software, 13 Cophall Gardens, London NW7

CIRO SOFT

PRESENT GAMES FOR ORIC

NIGHT RIDER — Adventure game with graphics. By combining the use of your memory and your arcade skill you can recover the shares for the Foundation.

£6 incl. p&p

SUB KILLER — A game of skill with 9 degrees of difficulty for one or more players. Random hazards appear, requiring you to change your strategy. Great fun.

£6 incl. p&p

COMING SOON

PARACHUTIST — Take off your aircraft, avoid the clouds and drop and land your parachutist to score points.

FRUIT — Standard fruit machine game with Win, Nudge and Gamble

£6 incl. p&p for both.

CIRO SOFT

184 Hiltbury Rd., Chancellors Road, Hants SO5 1NS.

FREE CATALOGUE

Containing
something for most
micro users

Software, hardware, dust covers, books (POST FREE), T-shirts, cassette leads, LOADING aids, test cassettes and head de-magnetisers etc, for
Ace, Atom, Atari, BBC, Commodore, Dragon, Genie, Lynx, Nascom, New-Brain, Oric, Sharp, Spectrum, Texas, Vic & ZX81

Send SAE to:

Dept PCN

FULCRUM PRODUCTS
14 Steep Lane, Findon
West Sussex BN14 0UF

SOFTWARE FOR YOUR CBM 64

SCRAMBLE	£6.50
FROGGER	£6.50
SPRITE MAN	£6.50
CRAZY KONG	£6.50
PANIC	£6.50
LANDER	£9.00
ATTACK OF THE MUTANT CAMELS	£7.50
MATRIX	£7.50
STAR TREK	£6.50
ROX	£4.95
GRID RUNNER	£7.50

A NEW ADVENTURE FOR YOUR 64

DEAD MAN'S GOLD: £8.50

We dare you to seek the treasure and return it to the correct grave.

NEW ADVENTURE FOR YOUR VIC 20 + 16K

THE ENCHANTED CHALICE: £7.50
Find the Chalice if you can.

Cheques/P.O. to:

BYTEWELL
203 COURT ROAD
BARRY,
S. GLAM CF6 7EW
Tel: (0446) 742491

Software

DRAGON/ATOM/ORIC-1

ADD LOW-COST I/O POWER WITH A VIA BOARD

Drive extra I/O devices, from LEDs & switches to extra peripherals. Link 2 micros for data/program transfer, spool listings to a second micro to print/save etc. (see TV-LINK below).

HARDWARE: 6522 VIA provides 16 I/O lines + control, serial port 2 timers, interrupt register, 10 voltage & interrupt lines taken to 28-pin DCC plug for easy connection to peripheral etc. Connectors available for Dragon, Atom, Oric 6022A version should be out soon. The Board may be interfaced to most other 6502/6809 micros, and may be shared between m/c's by changing the plug-in connector.

SOFTWARE: TV-LINK provides 2-machine parallel link (2 Boards needed) overall speed about 8K DAT A bytes/second with error checking.

A PRINT SPOOLER is included (only 1 Board needed) connect printer port to VIA board on receiving micro and use normal LIST/PRINT etc.

Assembled board + Atom connector £16.50
Assembled board + Dragon connector £18.75
Assembled board only - for your interface £14.00
Atom connector £4.00 Dragon connector £6.00
Cable (Printer port to VIA cable) £7.00
TV-LINK Board to Board cable £4.50
TV-LINK I/O cable Dragon Atom cassette £7.75
Blank cassette (cass.) 10 x C10 for £5.75

OTHER SOFTWARE:

CAVE QUEST Underdog quest for the ring of power. Dragon Atom Oric cassette £2.50
LASERPLAYERS Dragon joystick game £2.50
TEVINGO'S KINGDOM A real-time quest for magic powers (and survival) Oric £5.75

Other software and hardware available soon.
WANTED! Good software (games & serious) for royalties or outright purchase. Send for details.

MAIL ORDER ONLY.

SEND FOR LISTS/DETAILS

All prices fully inclusive of VAT, PIP etc.

Teward Microtech Ltd, (Dept PCN)
403 Dallow Road, Luton, LU1 1UL.
Tel: (0562) 418906

Programs Wanted

We require quality programs for most micro's and experienced programmers to undertake contract work.

We pay cash fees, royalties and distribute in the UK and USA.

Phone: Basingstoke (0256) 25107 or write to

DREAM SOFTWARE, P.O. Box 64,
Basingstoke, Hants. RG21 2LB

BBC MICRO USERS

"SECRETS"

Protect your files, BASIC programs etc. from prying eyes. The program "SECRET" encrypts/decrypts files of any type up to 20k on the model B. You choose your own passwords. Powerful utility for professional and hobbyist alike. User guide included with cassette.

£4.95 post paid cheques/PO's to:

DEAFORT SOFTWARE (PCN), ROSENTHAL, BANTON RD, DEAFORT, EBBW VALE, Gwent
Mail Order Only

Second User Equipment

NEW EQUIPMENT

EPSON FX 80 Printer £395.00
ZVM 134 Colour Monitor, 13 inch, Resolution 684 x 480
TTL levels RGB SUIT BBC Micro £400.00
ZENITH 14 Matrix Printers, Serial, kit form £145
ZVM 121 Green Screen Monitor, 12 inch £75.00
FLOPPY DISCS BASF Box of 10 £22.50

+ VAT

+ CARRIAGE

PMIS

Developments

202 "Special Court" Reservations, Hereford
Tel: 01432 78155 (053488 8070 DATED)

Dealers

PHOENIX SOFTWARE CENTRE

88 Huish, Yeovil, Somerset. Tel: 0935 21724

Open 9am to 6pm Monday to Saturday.

Largest stock of software in Yeovil for Atari, BBC, Dragon, Oric 1, Spectrum, Commodore and Vic 20.

Maintenance

SCHOOLS AND COLLEGES

HOME OR BUSINESS USERS

IN LONDON AND THE S.E.

FOR FAST ON SITE SERVICE

MICROS-NETWORKS-PRINTERS AT VERY COMPETITIVE RATES

B.B.C. MACHINES EPSON

RESEARCH MACHINES ANADEX

380Z AND 480Z MICROLINE

TECHNICAL AND SOFTWARE SUPPORT

24 HRS SERVICE AND 8 HOUR CALL OUT

MONITORS AND PERIPHERALS

K.J.M.

COMPUTER SERVICES

TEL: 01-851 6925

Hardware

COMPUTERS

AT

UNBEATABLE PRICES.

AT DOUBLE DISCOUNT CENTRE,
52 QUEENS MARKET,
GREEN ST.,
LONDON E13 9BA.

Atari 400 £148.95
Atari 800 £269.95
Colour Genie £169.95
New Brain 'A' £265.00
New Brain 'AD' £295.00
Vic 20 complete starters pack £139.00
Commodore 64 £229.95

Packing postage add £4.00 per item.

Appointed stockists for:
NEW BRAIN, COLOUR GENIE, COMMODORE.

Name

Address

.....

Signed

.....

Cheques payable to E.T. Co.

Access/Visa No.

Shops

Computerama

The Midlands

Home Computer Specialists

FOR BBC, SPECTRUM &
ALL LEADING MICRO'S
STAFFORD: 59 FOREGATE ST
TEL: 0785 41899

STOKE-ON-TRENT:
MARKET SQUARE ARCADE
TEL: 0782 268620

Programmers

PHOENIX COMMUNICATIONS

DIGITAL DIVISION

Apple 2 compatible peripherals,
including:

Language card

Disk drive controller

Z80 card — 80 column card

PAL colour card and many more

Check this price:

Disk Controller Card £28.00 + VAT

For more details send SAE for catalogue to:

16 Theobald Street,
Borehamwood, Herts WD6 4SE
Tel: 01-207 5590

Books

MICRO BOOKS BY POST

BBC

- THE BBC MICRO, 380 pgs. The complete beginners handbook £9.95
- ASSEMBLY LANGUAGE PROGRAMMING ON THE BBC MICRO, 192 pgs. £9.95
- CREATING ADVENTURE PROGRAMMES ON YOUR BBC MICRO, 160 pgs. £7.95
- GAMES BBC MICRO'S PLAY, 113 pgs. 40 exciting games and graphics £7.95

ZX SPECTRUM

- EXPLORERS GUIDE TO THE ZX SPECTRUM & ZX81. Are you making the most of your ZX micro? £9.95
- SPECTACULAR GAMES FOR THE ZX SPECTRUM £4.95

VARIOUS

- MICROCOMPUTER GRAPHICS, 282 pgs. Make the most of your micro's graphic capabilities £10.95
- LEGAL CARE OF YOUR SOFTWARE, 256 pgs. How to protect your programmes £12.95
- THE LITTLE BOOK OF BASIC STYLE, 151 pgs. How to write a programme you can read £7.50
- M8000 PROGRAMMING, 160 pgs. £10.95
- TANTALIZING GAMES FOR YOUR TANDY COLOR £4.95
- CREATING GAMES FOR YOUR TANDY COLOR £4.95
- PASCAL from BASIC, 182 pgs. £7.95
- LOGO PROGRAMMING, 240 pgs. £9.95
- DISCOVERING APPLE LOGO, 176 pgs. £11.95
- CP/M & THE PERSONAL COMPUTER, 512 pgs. £14.95

Postage & Packing are included in the price so send cheque/PO

MAIL ORDER ONLY to:

PROTECNICS,
24-25 WALTON CRESCENT,
OXFORD OX1 2JG.

SHORT-LENGTH COMPUTER/AUDIO TAPES

If you have searched without success for high quality low cost short-length tapes then sit back and relax.

Premium Grade Agfa R.F.W. Cassettes Manufacturers of high quality blank cassettes suitable for programming. For example, with a minimum order of 25, you can purchase 25 cassettes of 2 1/2 minutes each side for only £10.00 plus postage & packing of £1.95p. Fill in the coupon and post with your remittance to: R.F.W. Recording Supplies, Green Acres, Northlands, Sibsey Nr. Boston, Lincolnshire PE22 0UA.

Tel: 0205 750 595

All prices are inclusive of VAT at 15%

Please send me high-quality audio tapes in the quantity indicated (tick where applicable)

25 cassettes

(including £1.95 p&p)

- | | |
|-------------------------------------------|--------|
| <input type="checkbox"/> 2 1/2 mins..... | £11.95 |
| <input type="checkbox"/> 5 mins..... | £12.20 |
| <input type="checkbox"/> 6 mins..... | £12.45 |
| <input type="checkbox"/> 7 1/2 mins..... | £12.60 |
| <input type="checkbox"/> 10 mins..... | £13.20 |
| <input type="checkbox"/> 12 1/2 mins..... | £13.95 |

50 cassettes

(including £2.49 p&p)

- | | |
|-------------------------------------------|--------|
| <input type="checkbox"/> 2 1/2 mins..... | £22.75 |
| <input type="checkbox"/> 5 mins..... | £22.95 |
| <input type="checkbox"/> 6 mins..... | £23.49 |
| <input type="checkbox"/> 7 1/2 mins..... | £23.99 |
| <input type="checkbox"/> 10 mins..... | £24.99 |
| <input type="checkbox"/> 12 1/2 mins..... | £26.49 |

100 cassettes

(including £3.50 p&p)

- | | |
|-------------------------------------------|--------|
| <input type="checkbox"/> 2 1/2 mins..... | £43.50 |
| <input type="checkbox"/> 5 mins..... | £44.50 |
| <input type="checkbox"/> 6 mins..... | £45.50 |
| <input type="checkbox"/> 7 1/2 mins..... | £46.50 |
| <input type="checkbox"/> 10 mins..... | £48.50 |
| <input type="checkbox"/> 12 1/2 mins..... | £53.50 |

Including inlay card & side-labels.

Total Remittance £

NAME _____

ADDRESS _____

I enclose my cheque/PO

Please make cheque/PO payable R.F.W.

Still Available

JOYSTICKS from £4.50 each

DIRECT FROM
OUR FACTORY



THE NEW DELTA 14 HANDSET FOR THE BBC
Used for years by DATABASE owners these High Specification handsets have 14 pushbuttons to take the strain off of your keyboard.
The DELTA 14 comes in two parts. One handset will plug into the A-10 to give analogue spring return joystick plus three button functions.
The second part is the DELTA 14B-1 adaptor box which connects the 15 way "D" to the user port. This gives 12 buttons on a 4x3 matrix. The eighth line selects a second joystick which can be plugged into the adaptor box.

DELTA 14B JOYSTICK HANDSET FOR BBC £10.95
DELTA 14B-1 ADAPTOR BOX AND CABLE £13.95

OUT NOW



Cheque or PO with order. Prices quoted INCLUDE VAT, 1st Class Post, immediate despatch — 7 day money back guarantee.

VOLTMACE LTD., PARK DRIVE, BALDOCK, HERTS.
Callers welcome Monday to Friday.

IN KIT FORM: kit contains 1 switched joystick assembly, 2 moulded case halves, fire button, 1.5 metres 5 core + screen cable, fixing screws. **£4.50 per KIT**
READY BUILT with 9way "D" socket — suit Atari or Vic 20. **£5.95 each**
FEW ONLY with potentiometers and 5 way din socket to suit Dragon. **£5.00 each**

CONNECTORS

"D" connectors 9 way female plug or 15 way male plug complete with hoods **£1.75**
Din plug 5 way 240 deg. **50p**
9 way female plug provided to 1 metre of 9 core lead **£2.50**
AERIAL SPLITTER SWITCHES **£2.50**
(Saves unplugging T.V. Aerial to connect computer)

ELINCA

ZN

TAPELOADER



SAVE

OFF

LOAD



Other Micros to follow... BBC, Electron, etc. Please enquire.

ELINCA PRODUCTS LTD.(B)

Lyon Works, Capel Street,
Sheffield 6. (tel 0742 339774)

For ZX81 & SPECTRUM.
Trouble-free loading
from unspoiled tapes.
Switch from SAVE to LOAD
without removing plugs.
Passive filter on SAVE.
• Send SAE for leaflet.
• State ZX81 or SPECTRUM.

£14.99

Inc. VAT — Post FREE



STUNNING BRITISH DESIGN

for users who care for their
precious 5 1/4" Diskettes
£3 each or £30 for ELEVEN

Same day despatch — Cheques to:
SEE 10 27a High Street
Petersfield, Hants. Phone (0730) 67622

SPECTRUM RAM UPGRADE

16K-48K



EASY TO FIT.
CHIPS JUST
PLUG IN.
NO SOLDERING.
SENT WITHIN 10
DAYS

INCL.
VAT,
P. & P.

ISSUE TWO
MACHINES ONLY
(BLUE KEYS)
S.A.E. for details,
please.

DISPLAY INSTRUCTION SHEET

Get the best possible results from your Spectrum.
Deals with yellowish white, wobbling colours etc.
Send £1 plus Stamped Addressed Envelope

MAIL ORDERS ONLY. Cheques/P.O.s to:
FOUNTAIN COMPUTERS LIMITED
Bishop Court,
Bishopstoke,
EASTLEIGH
Hants, SO5 6PE
(0703) 816505

**! SORRY, NO OVERSEAS
ORDERS ACCEPTED**
(Including BFPO, Channel
Islands and Eire).

Speed up the action with PICKARD JOYSTICK CONTROLLER

Allows use of any keys, not just cursors — no
special programming — does not affect other
add-ons — special price until the end of June.

Price: £19.95 + £1.50 p&p
Spectrum ZX81 compatible

Success Services (Dept PCN)

154 High Street, Bloxwich, Walsall,
West Mids, WS3 3JT
Tel: (0922) 402403

LOOK — COMPUTER STATIONERY

SMALL OR LARGE QUANTITIES AVAILABLE
Continuous listing paper — music rule or plain. 500, 1000, 2000 sheet.
Continuous labels — large range of sizes in packages of 500-5000,
larger quantities available.

Continuous envelopes. Cleaning kits
Store your work safely in one of our printout binders.
Catalogue on request. Speedy service.

HCL COMPUTER SUPPLIES
19 GREENLANDS ROAD, KEMSING,
SEVENOAKS, KENT
TEL: OTFORD (09592) 2918
THE No 1 IN MAIL ORDER



LEADS

MICRO TO PRINTER LEADS

Full 36Way Centronics to Centronics.....	£13.95
Full 25Way RS232C (V24).....	£17.00
Osborne 1 to Centronics Printer.....	£20.95
Atari Interface to Centronics Printer.....	£19.95
BBC Micro to Centronics Printer.....	£13.90
Dragon 32 to Centronics Printer.....	£13.60
BBC Micro to RS232C.....	£13.60
Onic 1 to Centronics Printer.....	£13.60

All Leads are 1.5m long.
All prices include postage & packing & VAT
Leads can be made to order any length
Trade discounts available

Cheque with order please to:

HIGH TECH DEVELOPMENTS LTD.,
20 Wentwood View,
Caldicot, Nr Newport NP6 4QG
Tel: 0291 423310 or 0934 23156.

Do you suffer from PCNitus?

Thousands do! So, specially for all you sufferers who want to keep PCN immaculate, easily accessible and out of reach of grubby hands, we've designed this attractive PCN binder.

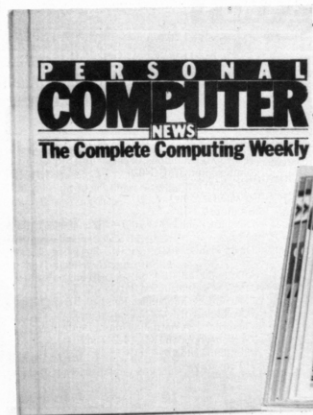
It's red, yellow and silver and will hold four month's copies.

No more grappling in the back of cupboards; no more bent and creased pages!

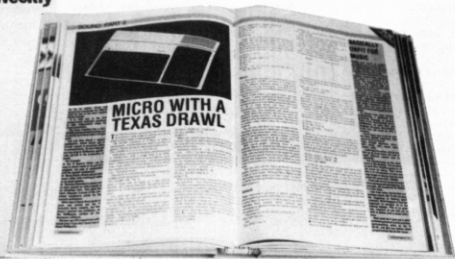
Your copies lie completely flat,

even when the binder is full. You'll be able to read them easily and refer to them quickly. And we'll post the binder to you in a batter-proof package at no extra cost.

It's an attractive price, too. Only £3.50, including postage, VAT and handling. Use the coupon here or, to avoid defacing your copy of PCN, write out your order clearly and send it with payment to the address given.



**ONLY
£3.50**



BINDER ORDER CARD. Please rush me _____ PCN binder(s) at £3.50 each. I enclosed my cheque made payable to Personal Computer News. Please charge my Access/Visa/Diners/American Express card (delete where not applicable)

Account No. Name
Address Town Postal code
..... Signed

Send to Personal Computer News, Binders Department, 53/55 Frith Street, London W1A 2HG

Acorn a-plenty at the launch

Acorn officially launched its £199 Electron with an educational presentation that would have put Janet and John to sleep.

To help us swallow the clichés of the show there were green Electron cocktails.

The films about what the Electron can do in the home were peppered with technical faux pas.

An actress, for example, was shown in one film clip 'accessing

a database' of her at-home files using the Electron, with the results of her home spreadsheet appearing immediately on-screen.

This would have been credible had some form of storage device been at least visible in the picture, but considering that the bare Electron in the film had no disk drive or even tape recorder to recover the results of this supposed database, the credibility gap was enough to drive an Acorn delivery truck through.

A movie-ing experience

Despite the best efforts of software producers, games aren't yet two a penny, but the day isn't far off. So when a company has a new game on sale it has to find a new way of tarring the game up to make it stand out from the rest.

Silly Software has made a good start by choosing such a witty company name. The name of its first game, *Movie Producer*, isn't quite as witty

but even Oscar Wilde had his occasional off days. Besides, *Movie Producer* has more for it than a mere going name.

According to Silly Software (SS) 'it has a theoretical 25 billion levels of play'. Assuming that the movie you're producing isn't *Heaven's Gate* or *Renaldo and Clara* (seven hours plus each), assuming in fact that it is just a 30 second ad for Channel Four, it will take you approximately 23 years and nine months of continuous play to enjoy the game in all its intricacies.

SUNTAX ERRORS

Left hanging

Price and availability details for the Suspended game from Infocom for the Commodore 64, missed out last week, are as follows:

Name Suspended **System** Commodore 64 **Price** £34.94 **Publisher** Infocom, 55 Wheeler Street, Cambridge, Massachusetts, 02138 **Format** Disk **Language** Machine code **Other versions** Apple, Atari, Texas, IBM, TRS80 **Outlets** Carousel Software, 36 Harlow Park Crescent, Harrogate HG2 0AW.

NEXT WEEK

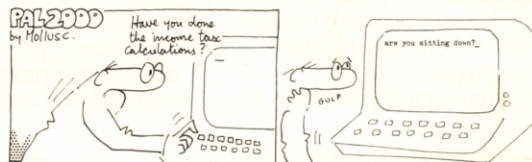
● **Micropaedia** — PCN starts a three-parter on the Dragon 32.

● **Hardware** — Look Sharp with a full Pro-Test of the new MZ 700.

● **Software** — Is there room for Lisp on the BBC?

● **Peripherals** — Memory interfacing on the ZX81: how to make the most of 1K.

● **Plus** news, letters, tips, program cards, book reviews...



PCN DATALINES

PCN Datalines keeps you in touch with up-coming events. Make sure you enter them in your diary.

Organisers who would like details of coming events included in

PCN Datalines should send the information at least one month before the event. Write to PCN Datalines, Personal Computer News, 62 Oxford Street, London W1A 2HG.

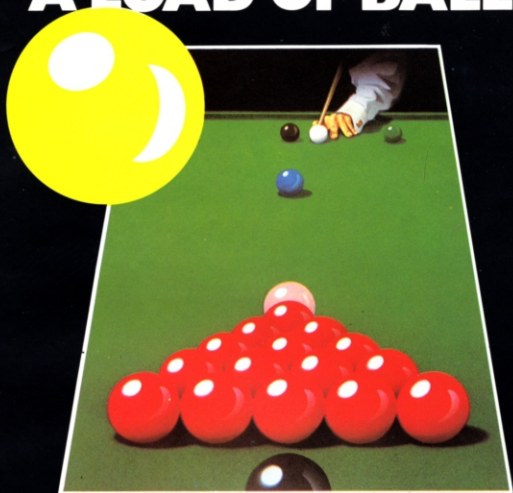
UK EVENTS

Event	Dates	Venue	Organisers
First Hampshire Computer Fair	Sept 8-9	Southampton Guildhall	Testwood Exhibitions, 33/34 Oxford Street, Southampton, 0703 34020
Video, Audio and Computer Show	Sept 16-18	Bradford Exposition Centre	R. Cooper, J. Wood & Sons Ltd, Bradford 720014
BBC Micro User Show	Sept 16-18	Sherwood Rooms, Greyfriar Gate, Nottingham	Database Publications, 061-456 8383
Second National British Osborne Owners' Group Meeting	September 17	National Liberal Club, 1 Whitehall Place, London SW1	Dr J. Anglesea, 021-472 1311 Ext 275
Home Entertainment Show	Sept 17-25	Olympia, London	Montbuild Ltd, 01-486 1951
Kent Apple Village	September 18-21	Stour Centre, Ashford, Kent	Database Publications, 061-456 8383
Computer Open Day Exhibition	September 22	Central Hotel, Glasgow	Couchmead Communications Ltd, 01-778 1102
Microcomputers in Business	Sept 27-29	Warwick University, Coventry City Conference Centre, 76 Mark Lane, London EC3	Peter Bubb, 01-892 4422
IWP one-day workshop	Sept 29	Barbican Centre, London	Quadrilex, 3 Courtfield House, Baldwin Gardens, London EC1, 01-242 8697
Personal Computer World Show	Sept 29-Oct 2	The Sir Frederic Osborn School, Welwyn Garden City	Montbuild Ltd, 01-486 1951
Computer Fair	Oct 2		R Brown, Welwyn Garden City 23367

OVERSEAS EVENTS

Event	Dates	Venue	Organisers
Australian Computer Exhibition	Sept 13-16	Melbourne, Australia	Riddell Exhibition Promotions PTY Ltd, 166 Albert Road, South Melbourne, Vic 3205
International Peripheral Equipment & Software Exposition	Sept 13-15	Moscone Centre, Anaheim, USA	Cahners Exposition Group SA, 0483 38085
Computex	Sept 20-22	Limerick, Republic of Ireland	SDL Exhibitions, Dublin 763871
Info '83	Oct 10-13	New York, USA	Cahners Exposition Group, 0483 38085
Computer Systems International Trade Fair & Congress	Oct 17-21	Munich, West Germany	ECL Exhibition Agencies, 01-486 1951

MORE THAN A LOAD OF BALLS



The pink's teetering on the edge of the pocket, the red's partially blocked, and now it's make or break.

Do you add a touch of spin or do you play safe?

Do you try for the trick shot or go for the snooker?

Visions Snooker brings all the excitement and all the tension of big time tournaments to your TV set.

With an advanced programme written by a 19 year old undergraduate at Queens College Cambridge, it makes Pot Black look like a load of old balls.

Visions **Snooker**. It's an exciting test of your skills on the cue. And it's yet another great game from Visions.

The ultimate name in video games.

Visions

FANS PLEASE NOTE! ALSO AVAILABLE MAIL ORDER
FROM VISIONS (SOFTWARE FACTORY) LTD
1 FELGATE MEWS, STUDLAND STREET, LONDON W6



SNOOKER VS 03-14



SHEER PANIC VS 02-16



PITMAN SEVEN VS 01-48

ocean

NUMBER 1

IN GAMES SOFTWARE

**PRESENTS
SIX OF THE
BEST**



SIMPLY FANTASTIC!

Games packed with more fun, challenge and excitement. Guaranteed to give you hours of enjoyment over and over again.

Featuring

- **SUPERB GRAPHICS**
- **SOLID MACHINE CODE**
- **ARCADE SOUND EFFECTS**



Ocean Software is available from
W H SMITH, selected branches of Laskys
and all good software outlets.
Details phone 061-832 9143.
Trade enquiries phone 061-832 7049

EXPECT THE BEST - INSIST ON

ocean

OCEAN SOFTWARE LIMITED, BALLI BUILDING,
STANLEY STREET, MANCHESTER M3 9FD.