POPULAR
Computing WEEKLY

Only 45p.

25 April – 1 May 1985

It's the best selling weekly

Vol 4 No 17

Atari and CBM show micros

ATARI and Commodore dominated the home computer market's presence at this Germany's giant consumer electronics show, the Hannover Fair last week.

Both were showing their new products for the first time in Europe – Atari with its 520ST and 130XE, and Commodore with the C128 and C128D.

The 520ST will be the first of Atari's ST range to appear offering 512K Ram, Basic, Logo, DR's GEM operating system in Ram and coming bundled with a 3½ inch disc unit for £699.99.

Several of the Atari machines announced by Jack Tramiel last September were conspicuous by their absence at Hanover. No 32-bit workstation, 65XE, 65XEM 130ST or 260ST were shown.

"The 32-bit workstation, the TT, which stands for 32/32, is in development now, and it is possible it will be ready by June," said Sam Tramiel, , president of Atari US. "We will not start on the 65XE until stocks of the 800XL are all sold, and the music chip for the XEM is not yet ready."

Commodore's C128 is now expected in the UK in August, three months after the Atari machines – priced around £300.

Atari claims to have

continued on page 6 ▶

ATARI 130XE AMSTRAD 664 REVIEWS INSIDE

Acorn plans new BBC next month

ACORN now seems likely to announce its long-awaited BBC B Plus successor for the BBC micro in May (see *Popular Computing Weekly*, December 20).

The machine, which will be priced at £499, will be an upgraded BBC B with 64K Ram and 20K shadow Ram.

Packaged in the present BBC B case the new machine will directly replace the present machine – when existing stocks of the BBC B have been sold the older model will be discontinued.

continued on page 5 ▶

Amstrad launches 664

THE FIRST of Amstrad's new CPC 664 micros should be in the shops next week. The CPC 664, successor to the CPC 464, was officially launched last week.

As was widely expected, the built-in cassette recorder on the 464 has been replaced by a 3 inch disc drive. The machine does, however, have a cassette port at the back of the machine, replacing the disc port on the earlier model.

Like its predecessor, the CPC 664 will be available in two versions, with either a built-in monochrome or colour monitor. The monochrome model will cost £339.00, the colour version £449.00.

Software for the CPC 464 should run on the new machine, although a few enhancements have been made to Locomotive's Basic used on both machines. The CPC

continued on page 5 ▶

INSIDE ⟩ HANOVER FAIR REPORT CONTINUES ON PAGE 6 ⟩

U.S. GOLD
At American Software

presents:

for ATARI, 64,
BBC, SPECTRUM,
AMSTRAD

BC II GROG'S REVENGE

™
MD

Outstanding Cartoon-Style Graphics

Thor is out to find the Meaning of Life but to get there he must have clams. Oh, but it's a hard journey. Climb steep hills. Dodge rocks and potholes. Speed through treacherous caves. Avoid Tiredactyls and the Mighty Grog!
Follow the straight and narrow. Cross each bridge as you come to it. Take the high road and the low road and you too can learn the Meaning of Life! Yes, it's worth every clam to see GROGS REVENGE!

DISK £14.95 CASSETTE £9.95

Commodore 64 version manufactured under licence from Sierra On-Line Software. All other versions manufactured under licence from Sydney Development Corporation. US Gold Limited, Unit 10, Parkway Industrial Centre, Heneage Street, Birmingham B7 4LY.

POPULAR Computing WEEKLY

Vol 4 No 17

View

The two new machines reviewed in this issue – the Amstrad CPC664 and the Atari 130XE – both represent significant developments from existing successful designs.

Both are attempts to solve the biggest problem with 8-bit home micros: lack of memory.

With the current crop of 48K or 64K machines software houses are having to work harder and harder to achieve ever more marginal increases in program quality.

Amstrad and Atari's solutions for adding more memory are very different.

Amstrad's CPC664 still has only 64K Ram but uses a fast built-in floppy disc drive to supplement storage. Programs written on the 664 will be able to pull in extra code off disc as required.

Compare that with Atari's 130XE which is still cassette-based but offer 128K rather than 64K Ram. Programs on the 130XE load in two blocks with the main core program being able to call on additional graphics displays paged in from the extra 64K.

Both machines set new standards of value for money for 8-bit machines.

But what would be better for a home micro running mainly entertainment software would be a development of either the Spectrum or the C64 with extra Ram in paged blocks – maybe even as much as 256K. Just think what the top Spectrum of C64 programmers would be able to do given four times as much space to write in.

Come on Sinclair and Commodore, how about it?

Popular Computing Weekly this week goes up by 5p to 45p. We are sorry for the increase which has been forced by excalating print and paper costs.

Presents...

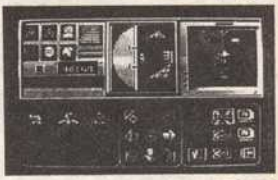
News > More Hanover Fair details **5**

Atari 130XE Review > Spearheading Atari's renewed assault on the marketplace **11**

Amstrad CPC 664 Review > We told you about it first – now we review it! Amstrad's first disc-based micro **14**

Software Reviews > Shadowfire on the C64 from Beyond > Chemistry from Merit on Spectrum 48K **17**

Star Game > Sold those BT shares yet? More killings to made in Stockmarket for the Amstrad machines **20**



Spectrum > Speed up those Basic programs using this Compiler program **24**

The QL Page > Mail Merge up-date – now use it with the new Quill version 2.00 **27**

BBC and Electron > The final part of the Tracer Project for the BBC B by Calvin Woodings **30**

Commodore 64 > Brush up that typing with Micro Typer from the keyboard of William Rowlands **33**

Best of the Rest > Arcade Avenue 36 > Adventure Corner 39 > Readers Chart 46 > Top 10, Diary 46 > This Week 47 > New Releases 47 > Puzzle, Ziggurat, Hackers 50

Futures . . .

BBC Star Game – over the sticks with Horse of the Year. . .On-screen calculator for the QL. . .Spectrum compiler continues

Editor David Kelly **News editor** Christina Erskine **Features editor** Graham Taylor **Software editor** John Cook **Production editor** Lynne Constable **Editorial secretary** Geraldine Smyth **Group advertisement manager** David Lake **Advertisement manager** Alastair Macintosh **Assistant advertisement manager** Tom Watson **Advertisement Executive** Diane Holyoak **Classified executive** Diane Davis **Advertising production** Lucinda Lee **Administration** Theresa Lacy **Managing editor** Duncan Scot **Publishing director** Jenny Ireland. **Published by** Sunshine Publications Ltd, 12-13 Little Newport Street, London WC2H 7PP. Tel 01-437 4343 Telex 296275 **Typeset by** Publishers Reprographics Services Ltd, 4 Roger Street, London WC1. **Printed by** Greenaway Harrison, Sutton Road, Southend-on-sea, Essex. **Distributed by** S M Distribution, London SW9, Tel 01-274 8611, Telex 261643 © Sunshine Publications Ltd 1985.

ABC

56,052 copies sold every week (Jan-June 1984 ABC).

How to submit articles Articles which are submitted for publication should not be more than 2000 words long. The articles, and any accompanying programs, should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here — so please do not be tempted. **Accuracy** *Popular Computing Weekly* cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work.

Computer Trade Association Magazine of the Year

First issue April 25

MICRO CHALLENGE . . . the first computer-age puzzle magazine

On sale every month at all good newsagents, price £1

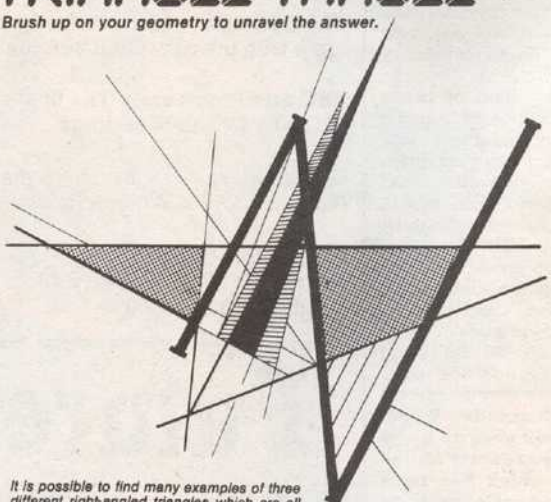
No, not another computing magazine. Micro Challenge is unique. Colourful and exciting, it's packed with intriguing puzzles — and prize competitions — devised specifically for microcomputer owners.

WIN A COLOUR TV!

This is an example of one of the many types of puzzle to be found in Micro Challenge — but it's also your chance to win a superb JVC portable colour television with remote control. Solve the problem, using skill, judgement and your own micro, then send the solution, on one of the prize puzzle entry forms from the May/June issues of Micro Challenge, to the address given in the magazine, marking the coupon AP1. (A proper form must be used; no photocopies or facsimiles are permitted). The competition closes first post on June 17, 1985, and the first correct entry opened wins the prize.

TRIANGLE TANGLE

Brush up on your geometry to unravel the answer.



It is possible to find many examples of three different right-angled triangles which are all equal in area. Can you, however, find three such triangles for which every side is a whole number of units (an integer)? Try to devise a program to find the trio with the smallest possible area.

Order a regular copy from your newsagent now. Details of subscriptions or postal deliveries contact: MICRO CHALLENGE Somers House, Linkfield Corner, Redhill, Surrey RH1 1BB

Virgin to re-issue Rabbit

VIRGIN Games is planning to launch a new budget software label in the Autumn, almost certainly titled Rabbit Software after the new defunct software house whose title Virgin purchased after its crash last year.

Said Virgin's Managing Director Nick Alexander, "We felt it was a name that had some integrity and honesty associated with it through its long history – Rabbit was one of the very first software houses."

Launch date for the label is not yet fixed. "We're looking at a possible Autumn timing but we'll see what shape the market is in at the time – the world doesn't need another software house."

Rabbit software products would continue to be in the arcade game vein. "I think the only difference will be that Rabbit label software will have to be at least six or seven out of ten whilst Virgin label games will need to be nine or ten out of ten."

"The real advantage of having a second software label is in distribution, because we can issue a much greater volume of material." Virgin already has some titles suitable for the new range but may also reissue some deleted titles from the Virgin range, "When we got all the flak for putting out poor quality material last year a few titles got left by the way-side which were actually pretty good," Nick continued.

Price for titles in the budget range is not yet fixed but will be either £2.50 or £1.99.

Amstrad 664 launched

◄ continued from page 1

664's new Basic version 1.1 mark 2 Rom includes several new keywords.

The new machine also has an expansion port, to which an additional disc drive can be connected, priced at £159.

The launch of the 664 does not, however, mean an immediate price cut for the 464. "I can't see any reason why the price should change," said Amstrad chairman Alan Sugar. "Any reduction we may make would be due to a reduction in component prices – not through compromising our market."

Amstrad will not be offering an up-grade facility for 464 owners to get the 664's Mark 2 Rom. Also, new 464's now being produced will not feature the new Rom. Sugar blamed software houses which have not followed Amstrad's guidelines for software providors and written 664 incompatible software for the 464 for the decision.

Disc software for the 664 will start at around £11, and Amstrad is also offering its customers an up-grade from cassette to disc service. For the price of a blank diskette, Amstrad will copy across user's 464 cassette software.

The CPC 664 will initially be sold in Rumbelow, Currys and W H Smiths, and by mail order. Amstrad plans to sell 600,000 computers over the next year. However, Alan Sugar said he still "expects the 464 to be Amstrad's main seller at Christmas."

● **The 664 is reviewed in this issue on page 14.**

"All that technology – and all he wants to know is where's the cassette port!"

Acorn's new BBC

◄ continued from page 1

A totally new board has been designed for the Plus and one extra Rom socket has been added to the original five. Each socket can now hold 32K and the Basic and operating system chips have been combined on to a single chip.

A single DFS will be provided – not the ADFS which had been expected.

All BBC B software will run directly on the BBC B Plus, though new software written to take account of the Plus' additional hardware may not then run on the BBC B.

Acorn will offer an up-grade facility from BBC B to B Plus although it is not yet clear how much this will cost.

● Rumours persist that Acorn may be working on a 16-bit BBC C micro using the 16-bit version of the 6502 chip, the W65SC816, for launch before the end of this year.

War over Amiga continues

WHILE both Atari and Commodore were exhibiting at Hanover, the legal wrangle between the companies over Amiga Inc. continued in the US. Amiga, which developed a rival for Atari's ST machine, was bought last year by Commodore.

Following last August's suit by Atari against Amiga over graphics chips developed by Amiga for Atari, Atari has brought a new suit, charging that the Amiga micro Commodore plans to launch infringes an Atari patent. It is seeking unspecified damages.

It is thought Atari is trying to prevent Commodore from bringing out the Amiga computer which Commodore hopes to release this summer in the US. Commodore contends that Amiga cannot be prevented from using its own chips, and so Commodore, as Amiga's parent company, cannot be stopped either.

Bug Byte in liquidation

BUG BYTE has now gone into voluntary liquidation following the announcement last week that the company was insolvent (see *Popular Computing Weekly*, 18 April). A creditors' meeting has been arranged for May 1st.

DK'Tronics up for sale

DK'TRONICS, the software and peripheral company, is up for sale.

The news, which follows the launch of its licensed game *Minder* last week, came to light during a court case in Saffron Walden, Suffolk.

Standing accused of assault with intent to cause grievous bodily harm was DK'Tronics' managing director David Heelas. Having pleaded guilty, he said through his solicitor that he was selling the company and moving to Great Yarmouth.

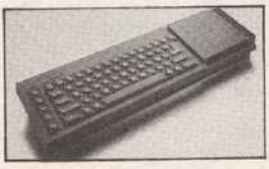
Heelas, who assaulted a man he suspected to be having an affair with his wife, was given a conditional discharge for one year and ordered to pay £25 costs.

It is thought one of the other directors of DK'Tronics is planning to buy the company.

Spain gets its own QL

SINCLAIR has launched a Spanish version of the QL at La Format '85, the Barcelona computer exhibition held this month.

Charles Cotton, Sinclair Research's Overseas Business Manager commented, "A major part of our initial design brief was to make the QL a Spanish micro, a Swedish micro, and an Arabic micro."



The same approach will be used with the American QL which is still set for launch sometime this spring. It will be treated as a foreign language version, with different spelling and American idioms.

The keyboard has been altered, to incorporate the Spanish ñ, ç and ü.

The price of the Spanish QL is 125,000 pesetas, approximately £595.

● Sinclair has concluded a deal with Macmillan India, an off-shoot of the British book and magazine publishing house, to manufacture the Spectrum under licence in Bangalore, India.

Macmillan India plans to produce 75,000 machines in the next year for sale mainly in India priced at 3,000 Rs (around £200).

Hanover Fair report – p6

Hanover Fair details

◄ continued from page 1

launched the 520ST (512K) ahead of the smaller memory 130ST (128K) and 260ST (256K) largely because the much-touted GEM operating system used by the Atari ST machines is to be supplied on disc at first.

"It is inevitable there will be some bugs in GEM at the start, and it will be easier to refine from disc," said Atari US software president Sig Hartmann. "As Gem takes up around 110K, it seemed fairer to launch the higher memory machine initially when GEM is going into Ram."

When asked how Atari intended to carry out GEM upgrades into Rom after debugging, Sig Hartmann said, "We haven't looked that far ahead. Right now, we're concentrating on getting the machine out so that people can use it as soon as possible."

The 520ST is based on the Motorola 68000 processor,

Atari US president Sam Tramiel

with 512K Ram and 192K Rom. Both Personal Basic and DR Logo are included in the machine.

Also incorporated is a floppy disc controller, hard disc interface and MIDI interface. (This last feature has given rise to speculation that the 65XEM machine may not appear at all.) Ports comprise standard television socket, video monitor and RGB monitor, two joystick/mouse ports, a Centronics parallel interface and RS232C serial interface.

The GEM operating system allows the use of Macintosh-style icons, windows and drop down menus, controlled by a mouse. However, unlike the Macintosh, the 520ST has a colour screen display.

It is still unclear exactly when the 520ST will be available in the UK. The US launch is set for June, and Atari hopes the machine will follow in the UK a month or two later.

Atari also announced disc drives to go with the 520ST – the SF354 and SF314. Both 3½ inch drives, the 354 has a capacity of 500K and will cost around £150-£200, while the 314 has a 1Mb capacity and will cost around £100 more. Atari also plans a hard disc (10Mb unformatted, 8Mb formatted capacity) at £400.

There were also three monitors to go with the 520ST, the SC1224, SM124 and PS3000. The SC1224 is a medium resolution 12 inch colour monitor, the SM1234 hi-res monochrome and the PS3000 a hi-res colour screen. No prices have yet been settled for the monitors, but they should be between £100-£300.

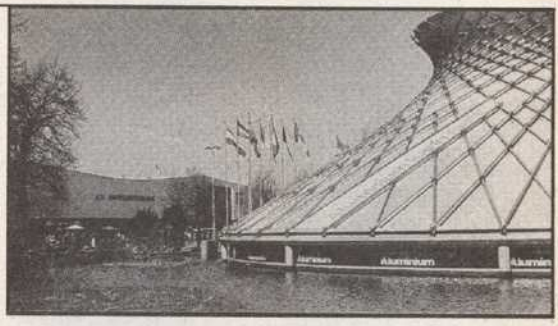
Printers were also announced for the ST – SMM804 and SDM124. The former is a dot-matrix device printing at 80cps, characters per second in black and white, the latter a daisy-wheel with a speed of 12cps. Complementary printer models for the XE machines, the XMM801 and XDM121 were also launched. The dot-matrix printer is expected to be about £200, the daisy-wheel slightly more expensive.

At the show, Atari's president Jack Tramiel assured: "All the machines and peripherals on show will be ready next month in the US."

The 520ST ran only demonstration software at the Fair, but Atari is hoping for a strong software base at launch. It has its own *Infinity* intergraded word processor and spreadsheet working under GEM, and *The Silent Butler*, an accounting package currently for the XE is set to be converted. Microsoft is planning conversions of its Apple Macintosh software. Jack Tramiel confirmed that software packages will not cost more than £50.

Commodore's stand was a good half-mile slog up the road three halls away, but no less crowded than Atari's.

Both versions of the C128,



the basic machine and a version with built-in disc drive, the C128D, were on show.

The C128 has been designed with compatibility as its highest priority. It runs in three modes – C64, C128 and CP/M mode – with two processors, the 8502 and Z80.

The 8502 is a new chip, compatible with the 6502. CP/M runs under the Z80 processor. Screen display is 40 columns only in 64 mode. In C128 and CP/M mode, the user can switch to 80 columns. Graphics resolution is 320 × 200 pixels only in 64 mode, but can be switched to 640 × 200 in the other two. Up to 16 colours can be used in all three.

The C128s floppy disc drive (built into the C128D) is compatible with the 1541 – maximum storage is 410K. The C128 uses Microsoft's Basic version 7 in C128 mode; in C64 mode the start-up screen is indistinguishable from the Commodore 64.

Commodore is still keeping price and availability details for the C128 relatively close to its chest. A German price of the basic C128 was announced, at DM1198.00 – about £315.00. "You can expect the English price to be comparable to that in Germany," said European software

manager Gail Wellington.

"The C128 is due to be shown for the first time in Britain at the Commodore Show in June, and we expect it to reach British shops around August."

The up-market Commodore Amiga machine was not displayed or previewed, but Marshall Smith, president of Commodore International, said, "The acquisition of Amiga Inc has given Commodore a world-class graphics and sound chip design capability that will ensure we remain on the leading edge of this technology."

The Amiga machine has been shown to all Commodore general managers around the world already, and Gail Wellington is optimistic it could be lauched in the UK at the end of this year. "It's due for a summer release in the US, but I don't think we could physically get it to Britain any earlier than the tail-end of 1985."

On the peripherals side, the 1571 disc drive first shown at January's CES Show, was on display at Hanover. Its German price expected to be that same as the C128 – DM1198.00 (£315.00).

Software already lined up for the C128 includes *Precision Script Plus* and *Superbase* both from Precision Software, Thorn Emi's *Perfect* series (under CP/M mode) and Audiogenic's *Swift*.

Other home machines computer manufacturers among the 6,778 exhibitors at the show took a much lower profile. Amstrad CPC464s dominated the Schneider stand, under whose name the 464 appears in Germany. A stand representative suggested a tentative date of September for the German launch of the CPC664.

There were also plenty of MSX machines – Sanyo, Sony, Toshiba *et al* – if one looked hard enough, but in general they were dwarfed in number by business machines from those companies taking priority on display.

● **The Atari 130XE is reviewed in this issue on p11.**

WIZADORE
BBC Micro £7.95

Available from all good software dealers.

Imagine Software (1984) Limited · 6 Central Street · Manchester · M2 5NS · Tel: 061 834 3939

The Fight Continues...
On The Spectrum.

NOW AVAILABLE ON THE 48K SPECTRUM

... Earth is threatened by an Empire Deathstar, can you penetrate its defences, destroy it before it destroys you? ... Deathstar Interceptor gives you 12 screens of 3D graphics, super smooth 3D animation, unbelievable sound effects, music, 4 skill levels and hi-score table ... this is the ultimate challenge!

... this game has to be played to be believed! You have not seen what the 48K Spectrum is capable of until you have played Deathstar Interceptor!

Available now at £7.95

Also available for CBM £9.99

A Crash Smash

HOW TO ORDER

To purchase Deathstar Interceptor, simply fill your name and address on a piece of paper, enclosing your cheque/P.O. made payable to: SYSTEM 3 SOFTWARE, and post to the address below. Please allow 7 to 14 days for delivery.

OVERSEAS ORDERS

Please add £1.00 per game ordered.

System 3 Software

South Bank House, Black Prince Road, London SE1
Tel: (01) 587 0873

NOMINATED FOR BRITISH MICRO COMPUTING AWARDS 1985

MIRRORSOFT

presents

The Mr. Men Collection

(and it's not just for kids, either!)

First hands-on experience with

FIRST STEPS with the Mr. Men

Cassette £8.95 Disk £11.95

Amstrad ● Atari ● BBC B ● CBM 64 ● Electron ● MSX ● 48K Spectrum

Then take a different direction with

HERE & THERE with the Mr. Men

Cassette £7.95
Disk £10.95

Amstrad ● BBC B/Electron ● CBM 64 ● 48K Spectrum

WORD GAMES with the Mr. Men

Cassette £9.95 (Double pack) Disk £12.95

BBC B/Electron ● CBM 64 ● 48K Spectrum ●

HI BOUNCER!

Cassette £6.95 Disk £9.95

BBC B ● CBM 64

Mr. Men Collection is available in all good software stockists.

In case of difficulty or for further information, please contact:

MIRRORSOFT Mirror Group Newspapers, Holborn Circus, London EC1P 1DQ. Tel: 01-822 3800 (Sales)

AMSTRAD's new computer: the CPC664.

SCOOP!

★ WIN A CPC664!

★ WIN 5 PROTEK MODEMS

★ WIN JET SET WILLY on the '464

Read all about it!

AMSTRAD CPC464 User is at all good newsagents from April 18th

NEWS... LISTINGS ... REVIEWS... COMPETITIONS... CLASSIFIED ADS... COMMENT.... FEATURES

The style console

Jeff Naylor reviews the first of the Atari new wave – the 128K 130XE micro, priced at £169.90

The launch this week of a new Atari computer, the 130 XE, is a significant event – a year ago many people would not have put money on Atari still being in business today.

Yet the company is now tipped to take the market by storm – not so much with the XE range, but with the forthcoming 68000-based ST.

The reason for the turn-round is ex-boss of Commodore, Jack Tramiel, who now runs Atari. His reputation is enough to make people start to take seriously the firm that was little more than an embarrassment to its old parent company, Warner.

The 130XE is the first of a number of 128K 8-bit computers – Commodore's C128 is also expected soon. Although restyled, the 130XE is firmly based on the existing Atari 800 XL.

The 800 XL has always been a sophisticated machine, admired particularly for its sound and graphics capabilities.

Its failure to become established as a major force in the UK micro scene has resulted from its price – the 800 (and the 400 before it) has until very recently been grossly over-priced.

Now all that's changed. The 130 XE, which uses the same 6502 processor chip as the Commodore 64 is a 128K machine which will sell for only £169.90. Twenty pounds under the Commodore 64 price for 64K more Ram, which should shake Commodore up a bit.

First impressions

Style is one of the assets that Tramiel has brought to Atari, and the 130XE has a decidedly 'stylish' appearance. Compared to the 800 XL, it is slightly deeper and looks less like a slab – the shape reminds me of a cut-down Dragon. The bold diagonal ribbing on the back panel is reflected in the shape of the function keys, which have been moved from a strip the right-hand side of the keyboard to a row above.

They have fairly specialised uses (Reset, Option, Start, etc) rather than being an aid to Basic programming as on MSX machines.

The keyboard itself is laid out in an identical manner to the XL, with the addition of graphic symbols to the front edge of some of the keys. Return is too small for easy location, and finding delete can be rather a hit or miss affair. The shift keys are a sensible size, but I dislike the placing of the caps-lock key on the right. The tactile qualities of the keys are excellent considering the price of the machine. Each key is individually sprung, although the switch mechanism appears to be a membrane. The travel may be too short for some people's tastes, but compared with a Spectrum +. . . . well, there is no comparison.

Connections to the XE are made via the right-hand side and the back, the joystick ports being the only sockets on the side. The serial port for interfacing printers, modems and discs conforms to the standard Atari pattern and there are RF and video sockets for feeding TVs and monitors respectively. Note that the output to the monitor is composite video only, but this is perfectly adequate considering the resolution; indeed some RGB monitors may not be able to reproduce the full palette of colours. The sound output is through the TV monitor speaker. The machine is powered from an external power supply via a DIN plug.

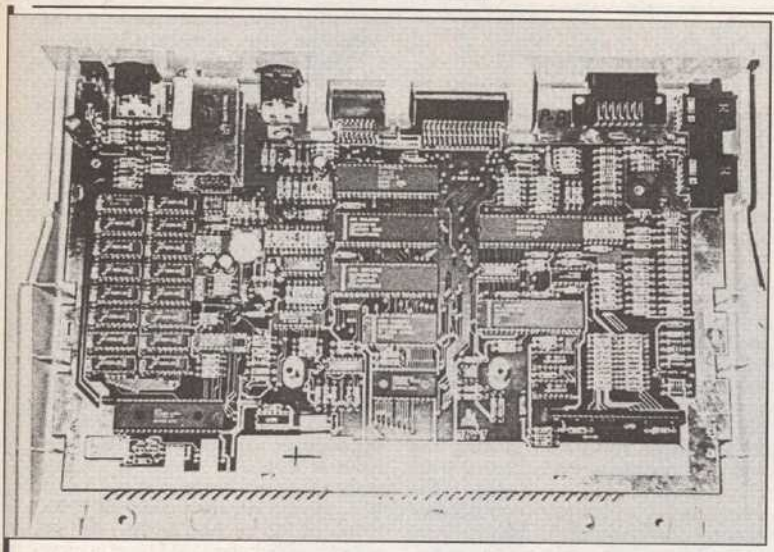
Also lurking around the back is the standard Atari cartridge slot, no longer easily visible and therefore not declaring "This is a games computer". Further connections to the internals of the XE are possible through an Enhanced Cartridge Interface slot (ECI), which brings, amongst other signals, A13-A15 out into the fresh air. In conjunction with the Rom port, it should be possible to connect any sort of additional hardware to the XE. Neither of these connectors impressed me greatly with their solidity, but unless you are going to spend all your time plugging and unplugging Roms, they should suffice.

Hardware

Inside the 130XE there are few surprises. The computer occupies one board that takes up the entire space (remember that the power supply is separate), and the whole affair is generously screened, which is normal with US computers because their interference regulations are somewhat stricter than ours. The circuit board has a well-built appearance, and the number of components is quite low – most of the logic chips have been condensed into a single ULA. On the left are a clutch of 16 Ram chips: all 64K by 1-bit devices that provide the 128K bytes (130,712) of memory. A custom memory management chip *(Freddy)* resides nearby.

The names of some of the other chips will be familiar to Atari enthusiasts – *Antic* is so powerful a chip that it is considered by some to be a second processor, providing 11 graphic modes and a palette of up to 265 shades of colour.

The *Pokey* chip (doesn't it sound like the eighth dwarf?) controls the keyboard and generates the sound, providing four voices with a range of 3½ octaves. The XE also boasts a PIA with 16 input/output



lines; eight of which concern the joysticks, while the remainder are used to control the memory.

The microprocessor used is the 6502C, running at 1.7 MHz. In comparison to Z80 machines this may appear slow, but the 6502 takes less cycles to perform many of its instuctions and the use of direct page addressing also speeds things up. Consider the BBC, one of the fastest home machines around, which runs a 6502 at 1MHz. If you bypass the Atari Basic and write in assembler, then the 130XE should be a fast machine.

The two remaining large ICs are both Roms. The operating system occupies 16K, but the Basic has to squeeze into 8K. By latter day standards this is somewhat paltry, even though the floating-point functions are handled by the OS Rom.

The hardware layout of the 130 XE can hardly be called new technology. Apart from the fact that it is based on an 8-bit CPU, the graphics and sound chips have been with us for many years. Even so, when they were designed they were well ahead of their time; for example, the hardware specification of the MSX range leaves the Atari reputation unscathed from a games point of view.

With such a vast range of tried and tested software, it must be hoped that there is life in the old format yet. If proof were needed that this is a 'tried and tested' specification, you need only look at the well-made circuit board – not one single chip is fitted via an IC holder.

When you've been building a machine for some time you get to know which chips can be relied on, and you can save money by soldering them direct: there are obviously few unknown quantities on the XE curcuit board.

One neat point is the provision of a 'self-test' function. This can be sued to check that the keyboard and sound are working correctly and also test the memory.

Software

Atari Basic is not the most exciting version of the language around, although this can mostly be blamed on its size. There are no glaring omissions: many of the reserved words can be abbreviated to one or two letters; the syntax of lines is checked on entry; editing can be achieved on-screen with the aid of the cursor keys.

It is unfair to criticise a lack of control structures or graphics commands, particularly when compared with the Commodore 64. The result of a small Basic, though, is that a wealth of Pokes are required for some quite ordinary tasks, making listings hard to understand and programs difficult to debug.

And so we come to the main question – how does an 8-bit computer with a 16-bit address bus usefully employ more than 64K of Ram? Manufacturers have tried many ways of using memory bank switching to increase the useful memory storage – from the Timex/Sinclair 2000 'home bank' system through the less torturous sideways Ram and Rom methods available of the BBC B, Enterprise, Amstrad et al. In most cases, however, the thing that is rarely achieved is a Basic that can easily exploit the extra memory. In this respect the 130XE makes no such attempt. The extra memory has three potential uses:

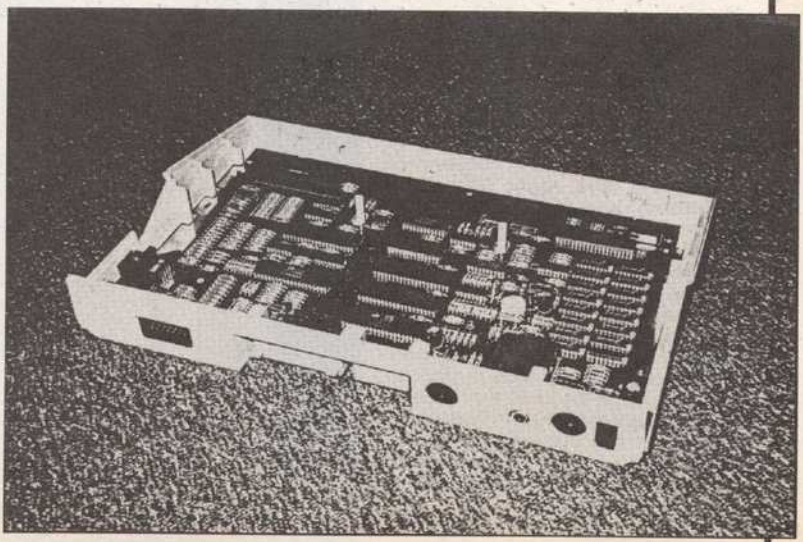
Machine code programs can quickly access another 64K of storage space;

The space can be utilised as extra graphic screen space allowing, for example, eight screens to be stored and displayed consecutively;

And finally, disc drive users will find that the 2.5 DOS uses the space to provide a Ram disc.

The first point to make clear about the 130XE is that, when first switched on, it provides software environment identical to the 800 XL and for that matter, the 65 XE, ("an 800 XL restyled as the 65 XE, which will probably see the light of day when we've cleared the stocks of the XL"). The OS is not just compatible – it is the same. All XL and clean 400/800 software will run on the XE. Even non-Atari software written for the early machines and using 'illegal' system calls can be made to run on a disc-based 130XE with the aid of a translator program. This, in effect, turns the computer back into an old 400/800.

When in this 'compatible' mode, Ram in the main bank responds to memory accesses in the area &4000 to &7FFF. By asserting four extra signals, the second bank of Ram can be addressed in 16K to 32K. One signal, CPU Bank Enable, when at logic O, causes CPU memory references to be directed to the second bank,



while negating Video Bank Enable will cause the *Antic* chip to fetch screen information from the second bank. Which 16K section actually responds depends on a two-bit signal (BA0 and BA1), selecting one of the four chunks. These extra signals are created by four previously unused outputs of the 6520 PIA.

From the user's point of view there are a number of nice touches to operating a 130XE. European users, with the aid of a single *Poke*, can convert the graphics symbols into an international character set. Another frill is the smooth scroll option that moves the text display on a pixel basis rather than by whole character lines.

Software which makes use of the extra memory will be available soon – a version of *AtariWriter* and *Infinity*, a Lotus 1-2-3 type of program. Perhaps the greatest attraction will be for disc drive owners. When using a 1050 disk drive (which will be repackaged to match the XE styling) and DOS 2.5, a 130 XE behaves as if it were fitted with drive number 8 and you can *Save* and *Load* to the additional Ram with the same ease, and greater speed, as a normal disc drive.

On the subject of discs, Atari is going over to the Sony 3½ inch format. The ST will use them exclusively, and plans are afoot for 250K, 500K, and 1M versions for the XE. With Apple already using 3½ inch drives and IBM rumoured to be taking them up, it seems as if the standard has been set.

The 130XE is accompanied by a manual which shows an up-turn in the standards of Atari documentation. Very few manuals satisfy both beginners and experienced users alike, but the 130XE's book is well presented and holds much useful information.

Conclusion

So where does the 130 XE fit into the future of Atari? Priced at present at £170, it represents good value for money.

Well constructed and backed by the software base developed for the older models, it could do well with Atari enthusiasts and newcomers alike.

Taking a negative view, though, it is only a restyled (to match the ST) long-in-the-tooth computer withthe bonus of plenty of spare Ram. The shops are awash with 8-bit home computers with 40-column text screens.

The new micros – affordable disc-based machines with 80-column screens, acres of memory and Macintosh-type operating systems – will be here sooner than we think, and Atari's ST will be in the vanguard.

The 130XE proves that Atari are capable of producing good, competitively priced products. Let's hope they keep it up.

Value without vision

***Jeff Naylor** surveys Amstrad's new CPC664 – the first low-cost disc based system*

Amstrad's new computer reflects a perceived demand for an affordable, disc-based machine.

For £339 you get a computer, disc drive and monochrome monitor that is suitable for running many CP/M programs, with the added advantage that a sizeable user base has already been built up by its predecessor, the CPC464.

An extra £110 – £449 – will provide you with a version with a colour monitor, although this is not so good for displaying the 80-column text mode. A complete, practical wordprocessing system can now be bought for well under £600.

The CPC664 is almost a 464 with a built-in 3-inch drive fractionally larger, with a change of colour scheme, dished keyboard and bigger cursor keys. Apart from the cosmetic changes, the hardware has the same specification as the 464 except the floppy disc controlling circuitry has been included on the main board and the 664 requires an additional 12 volt supply for the disc, provided from the monitor.

Amstrad has not followed Sinclair's mistake of omitting a cassette interface from their new machine. A Din socket is located on the back which conforms to the standard pattern for audio cassette players, including a remote start facility. Two extra connections are provided – the 12 volt input is a flying lead fitted with a plug, and a second disc drive (£159) can be plugged in. Other connections are the same as for the 464 – expansion (which is not now needed for the disc interface) and printer sockets are circuit-board edge connectors. Only one joystick port is provided (a special joystick is required to allow two sticks), as are 5V DC, monitor and stereo sound sockets.

On the software side, there is both good and bad news. The bad news is only bad for 464 owners and software writers who ignored the Amsoft warnings about using the operating system properly. The good news is that, while still retaining a 16K Rom, the Basic has been given a small number of useful enhancements.

A *Fill* command and the ability to draw dotted lines by using a *Mask* command are the most notable new graphic commands. Also there is an additional parameter for *Draw* and its related commands that allows you to control the plotting mode, *Xor*ing, *And*ing or *Or*ing the new pixels with the old screen contents. *Auto* has been enhanced, making it harder accidentally to overwrite old lines of Basic.

Dec$ has finally seen the light of day. This command, left out of the 464 although documented in the Concise Basic Specification, displays numbers using a pre-defined format template.

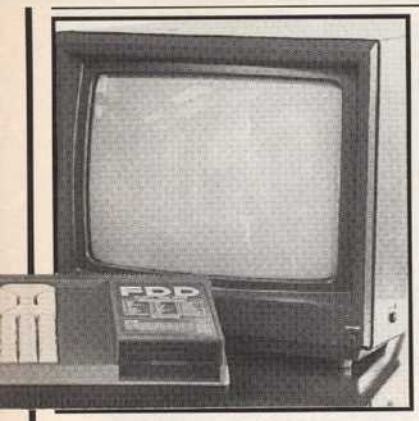
Most of the other additions take advantage of routines already contained in the CPC464 operating system. The best example is *Copychr$*, which reads the character from the screen. Used by the copy key routine and available from machine-code on the 464, it is now available to Basic programmers. The most trivial example is *Frame*, which replaces *CALL &BD19* by waiting for the next frame fly-back sync pulse.

One extra command has been added to interrogate disc errors so that they can be dealt with by the comprehensive error handling system (*Derr*), but otherwise the disc commands only have one important difference from the add-on 464 DDI-1 disc unit.

A couple of months ago, when I finally tracked down a drive for my 464, two disappointments lay in store. An assembly fault meant that the sound output was shorted out which forced me to break the warranty in fixing it and question Amstrad's quality control. The other was realising how clumsy the string parameter passing was for the external disc commands. To erase a file, for example, it is necessary to enter *"A$="filename":ERA,@A$"*.

This lack of foresight in the provision of the Resident System Extension routines has been cleared up on the new 664 Rom – *ERA,"filename"* will now work, although the bar prefix and extra comma still distinguish it as an external command. Locomotive Software has also rewritten the garbage collection routine which speeds it up, but may also have something to do with rumours of a large quantity of variable corrupting user-defined functions.

CP/M and Dr Logo are provided in the price of the 664. The CP/M implementa-



tion has the same limitations as the 464. It is supplied with a full set of utility routines and is a 'true' CP/M, unlike XtalDOS on the Einstein. Amstrad are now committed to the 3 inch drive, which they may come to regret. While there is by no means anything wrong with the format, the greater potential of the Sony 3½ inch system looks like making that the 'new' standard.

The Hitachi format 3 inch discs are not as expensive as they appear – both sides can be used – but at the moment they are difficult to get hold of. If no one else takes them up, the situation may get worse.

The bad news that I mentioned earlier is that there are no plans to provide the new Basic and operating system for CPC464 owners, which means a computer that has been available for less than a year already has an air of obsolescence. There should be no problem with machine-code or CP/M, just the extra Basic commands. These could all be simulated on a 464, but it is a pity that adding a disc drive to the 464 doesn't *quite* create a 664.

There is no question that the CPC664 represents tremendous value for money, achieved mainly by bundling items together. It is definitely to be regretted however, that there is no satisfactory way of up-grading the 464 to a full specification 664 by adding a disc unit.

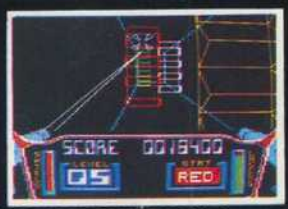
Compared to other machines currently available of the same price, the 664 wins hands down, and deserves to do well. If you are in no hurry, though, it may be worth waiting for something with a 16-bit processor to arrive.

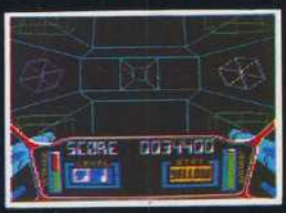
Table of CPC 464/664 software differences.

Command	664	464
AUTO	Line numbers are displayed for editing	'*'warns of overwriting
CLEAR INPUT	Flushes the keyboard buffer	Operating system
COPYCHR$	Reads CHR$ at cursor position	Operating system
CURSOR	Enables or disables cursor display system	Operating system
DEC$	Displays numbers using a format	Not available
DERR	Returns disc error report number	Not available
DRAW DRAWR	Extra ink mode parameter allows	Operating system
MOVE MOVER	control of the overplotting rules	
PLOT PLOTR		
FILL	Fills an arbitrary area with a specified ink	Machine code
FRAME	Waits for video flyback	Operating system
GRAPHICS	Sets colours of graphics	Possible but convoluted
PAPER/PEN		
MASK	Allows dotted line drawing	Machine code
ON BREAK CONT	Completely disables ESC	Machine code
PEN	Additional background mode parameter	Operating system
PRINT USING	Additional currency template	Not available
DIR DRIVE	Take normal string expressions	Strings passed by address
ERA REN		

AMSTRAD

£6.95
SPECTRUM 48K
£5.95
The ultimate space shoot-em-up





C+VG GAME OF THE MONTH
CRASH SMASH 93%

Please rush me: ☐ Starstrike (Amstrad) £6.95 ☐ Starstrike (Spectrum) £5.95 ☐ Tank Duel (Spectrum) £5.50 ☐ Both Spectrum Games £9.00

Name .....

Address .....

.....

Cheques/P.O.'s Payable to REALTIME SOFTWARE, PROSPECT HOUSE, 32 SOVEREIGN STREET, LEEDS LS1 4BJ

Get soft with your micro...

and make the best of it with Brainpower

SEND FOR MORE BRAINPOWER TODAY.

Are you really making the best of your micro – are you still using too much of your own brainpower?
We at Collins Soft have some very good news, six simple to use software packages called Brainpower that put you firmly in control and help you realise your own full potential:
Skills that will help you make decisions.
Skills that help you plan ahead.
Skills which can help your business.
Skills to discover the universe and skills which will organise your work.
With Collins range of Brainpower software you get a Teaching Program and Book which show you how easy Brainpower is to use on your BBC, Commodore 64 or Spectrum, plus the main Applications Program itself.
Discover Brainpower at WH Smith, Boots, Menzies and all good Computer Shops or simply post the coupon for information – today.

NOMINATED FOR BRITISH MICRO COMPUTING AWARDS 1985

Read what they have said about Brainpower.

ENTREPRENEUR
If you intend to go into business, Entrepreneur is an essential investment – Practical Computing.

PROJECT PLANNER
The manual has a simplicity that is endearing – Commodore Horizons.

STAR WATCHER
The best star-gazing program so far available on microcomputer – John Walker – leading software writer.

FORECASTER
I found the theories of prediction fascinating – Commodore Horizons.

DECISION MAKER
In many ways it has succeeded in an area that few other programs have even attempted – using the computer to educate adults – Popular Computing Weekly.

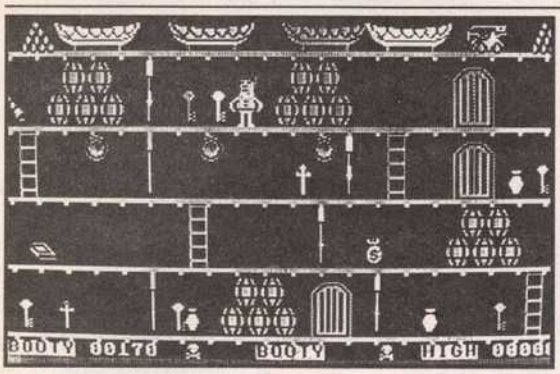
Collins Soft is a division of William Collins Sons & Co Limited
Brainpower is a trade mark of Triptych Publishing Limited.

Please send me my Collins Soft Brainpower brochure ☐ (please tick)
Name
Address
Post Code P.C.W. 4/85

BRAINPOWER
Application through learning
Collins Soft, FREEPOST 30, London W1E 7JZ

COLLINS SOFT

John Sloan Advertising Limited



Jim lad

Program *Booty* **Micro** Commodore 64 **Price** £2.50 **Supplier** Firebird, Wellington House, Upper St. Martins Lane, London WC2H 9DL

It's time for action on the high seas, mateys, as *Booty* is set on the dreaded pirate ship Black Galleon.

Jim, the cabin boy, has decided that life is boring in the ship's galley, and he sets out to make out a fortune.

You have to guide Jim through the twenty holds of the ship in his search for the pirates' treasure. Progress may be made by the large number of locked doors which can only be opened by picking up the appropriate colour-coded key. Whilst hunting for the many valuable items scattered throughout the ship. Jim has to avoid rats, the captain's parrots and the odd ghost pirate. Not only that, but to add to the danger, some of the treasure has been booby-trapped.

The graphics for this big, joystick adventure aren't exactly breathtaking, but they are certainly adequate. As with most adventures, the fun lies in exploring, and it's fairly easy to move round the holds of the Black Galleon. Be careful, though, you might end up in the sea!

The thing that bugs me about Booty is the way that you can be doing well, and then unexpectedly get killed by a parrot or something like that. These nasty little creations appear out of nowhere and polish you off before you've had time to blink.

Very frustrating. Nevertheless, Booty is a neat idea, represents excellent value for money and is very addictive.

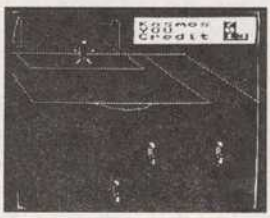
Tom Hussey

Foul ref!

Program *Answer Back Sport* **Micro** BBC/Electron **Price** £9.95 **Supplier** Kosmos Software, 1 Pilgrims Close, Harlington, Dunstable, Beds LU5 6LX.

Take a striking cover painting by Roz Woodcock featuring a black, male runner. . . a package calling itself "a sports game". . . a blurb about "playing high speed computer games" and you might think of *Daley Thompson's Decathalon.*

In fact it's a quiz program. A very good quiz program on the lines of previous Kosmos offerings. You choose one of 26 quizzes on sporting themes from general knowledge to 'Football for Know Alls'.



Then the program offers you a menu. You select how many of the 30 or so questions in each bunch you want, whether to see them as multiple-choice or yes/no choices, whether to run a random selection of the available problems and whether to fight against the clock or not. You can also make up your own questions, adapt an existing quiz or invent a whole new one.

Your reward for earning points is a chance to play "your favourite sports game" – football or tennis in an implementation as poor as those tv games of 8 or 9 years ago. To make sure you don't miss out there's even a cheat facility to ensure you have a few points.

Sounds in the games and quiz are restricted so that the program can run on Electrons or Beebs.

The quiz program is fine, the games are awful and the packaging misleading.

Dave Watterson

Little gems

Program *Smuggler's Cove* **Micro** CPC464 **Price** £1.99 **Supplier** Camel Micros, Wellpark, Willeys Ave, Exeter EX2 8BE

"Software at sensible prices" is the admirable aim of Camel Micros and I've already been very impressed by their utility programs such as the *Grasp* graph drawer. *Smuggler's Cove*, their first game to me knowledge, is another super effort, showing a rich sense of the unusual and a natural ability to build up atmosphere.

Despite the name, the game is set in the present where you are give the task of overcoming a curse placed on you by a long dead pirate. Unlike the Interceptor games, where the pictures are few in number but superb, each graphic is drawn from scratch rather than loaded in block from Ram. This allows a new design to be shown at every location, but they are only reasonable in quality and the fill routine is not blindingly fast. Fortunately, except for the irritating title screen, drawing speed is improved by limiting the graphic to a small window.

You are also allowed to type in commands whilst all this is going on, but it doesn't appear on screen until the picture is completed. The game supports quite sophisticated sentence analysis including the use of 'and'.

As for plots, short location descriptions are enlivened by long, humorous and bizarre comments that appear every so often. The majority of obvious and strange problems I've found to date are solved quite easily by simple 'find object – use object' Logic, but there is a lot more to this colourful and complex game that I haven't worked out. I highly recommend it.

Tony Kendle

Hubble bubble

Program *Merit Chemistry* **Micro** Spectrum 48K **Price** £5.95 **Supplier** J & L Randall, Potters Bar, London

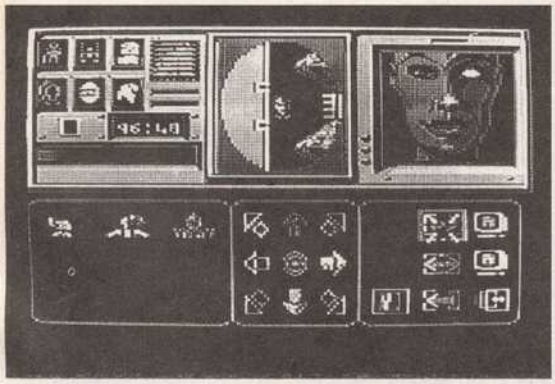
The Merit Chemistry set, with its tubes of colourful chemicals and spirit burner, has been part of childhood for many people.

How many who now create even more noxious nerve gases started by turning litmus red in their bedrooms?

This computer program is perhaps surprisingly targeted at a slightly higher age group though: it's probably best seen as an O-level revision aid. While its five main programs flesh out the theory of lab work there's still need for more detailed text book explanations.

Too little thought has gone into how to use the medium of the computer. Page after page of text is better done on paper, especially when it's as eye-straining as the periodic table of elements. Throwing in a couple of games (a term I use lightly – neither is exactly enjoyable) doesn't compensate. In fact the simulations are the only things uniquely suited to the micro but they're deadly slow – and isn't a little boat moving between Port Anode and Port Cathode rather juvenile for O-level students?

John Minson



Icons

Program *Shadowfire* **Micro** Commodore 64 **Price** £9.95 **Supplier** Beyond, Durrant House, Herbal Hill, London EC1R 5EJ.

Beyond has released in recent months quite a crop of good games for the Commodore 64.

Shadowfire is no exception. It is based on a revolutionary concept for a game, as icons (picture symbols) are used for controlling the various characters.

Just move the on-screen cursor to the icon representing the required action, press *fire*, and the command is implemented. This system is used a lot in business programs, but has not, until now, appeared in games.

Shadowfire is an adventure set in the far future. It's your job to get a team of highly trained commandos into the enemy skyfortress, Zoff V, to rescue the kidnapped ambassador from the evil clutches of the traitor, General Zoff.

With this almost impossible mission, the game starts with our heroes docking on to the side of the mysterious Zoff V.

The screen display is very impressive – some of the small pictures are extremely detailed, and the overall view is colourful and well set out. The operating system takes a bit of getting used to, but after a practise session or two, player-control becomes quite easy. The actual adventure is extremely complex and will probably take months to solve, as interactive control of the characters obviously needs to be mastered.

Certainly not a program for bone-head arcade zappers. This game is bound to start a new craze, and the operating system will probably become even more popular than the traditional adventure format. If you can, you should certainly try to get a chance to play *Shadowfire*.

Tom Hussey

The last bite

Program *Vampire Killer* **Micro** CPC 464 **Price** £1.99 **Supplier** Scorpio Gamesworld, 307-313 Corn Exchange Building, Manchester 4.

This is the first true budget software I've seen on the 464, (although you would have a case in saying that £6 is a budget figure given the outrageous prices that are typical with this machine).

Given its cheapness I would once have probably given it three stars but in recent weeks Mastertronic and Firebird have completely rewritten the definition of 'budget games' with such quality releases as *Finders Keepers* on the Spectrum, and its now no longer enough to use the excuse of value for money to cover unexciting games.

The game involves making your way up twelve floors of a skyscraper using the lifts to reach the top and kill dracula. On the way you must enter rooms, twelve on each floor to collect stakes, crosses, garlic and bullets to enable you to survive the meeting, and also clear various other monsters that may block your path. Behind each door you may receive a fright rather than a reward and if you get too many shocks you end up fleeing in terror.

It could work well as a sort of against the clock, disorientating, random hazards, panic game but it suffers from being far too slow to inspire interest. Added to which, the figure moves so awkwardly that it suggests a lack of enthusiasm on the programmer's part. I wish they had spent less time on the title screen and more on the game.

Tony Kendle

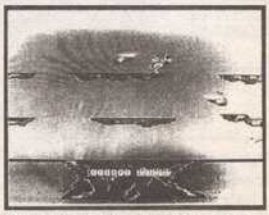
Bird battle

Program *Jouste* **Micro** Commodore 64 **Price** £6.95 **Supplier** IJK Software, Unit 3C Moorfields, Moor Park Avenue, Bispham, Blackpool.

Jouste is one of those very simple games that turns out to be particularly addictive.

The main idea of the game is to fly an ostrich-type bird in a jousting competition against several adversaries.

To kill your opponents you have to be flying higher than them at the point of contact. The screen consists of several platforms or space islands with a dangerous lava pit at the bottom. As well as combat with fellow jousters, an unbeatable pterodactyl has to



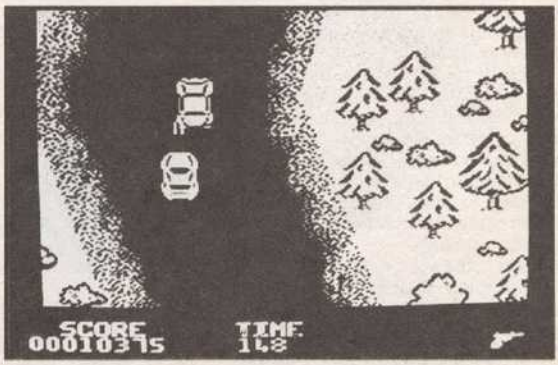
be avoided as it flies menacingly above. The graphics are quite good, with nicely drawn sprites and a good colour scheme. A few sound effects wouldn't have been out of place, though.

Tom Hussey

003

Program *Spy Hunter* **Micro** Spectrum 48K **Price** £7.95 **Supplier** US Gold, Unit 10, Parkway Industrial Centre, Heneage Street, Birmingham

"The Official Home Version of Bally Midway's 1st Arcade Hit" proclaims the back of the *Spy Hunter* box, while its cover explodes into a machine gunfiring sports car, helicopter, crashing car, speed boat... The game itself is, of course, a second generation shoot 'em up, vintage 1983, very much an arcade clone with its overhead view of flat graphics, a vertically scrolling road and some explosive sound effects. The idea is to do unto the enemy, in a variety of homicidal vehicles, before they do unto you. The conversion to Spectrum is also less than polished – the only way to reselect skill level seems to be by re-loading.



There are better mass destruction games.

John Minson

WE'RE SORRY!

APOLOGIES TO ALL YOU COMMODORE 64 OWNERS WHO HAVE BEEN PATIENTLY WAITING FOR

"Everyone's a Wally"

We just weren't prepared to release a programme of less than the highest possible standard, so we had to develop new programming techniques to handle the interaction of FIVE high resolution animated characters. This has now been achieved, resulting in a programme with unparalleled sophistication, graphics and entertainment value.
It will be available on Friday 26th of April from all good computer stores including:

Boots, John Menzies, W.H. Smiths, Laskys, etc.

Spectrum 48K £9.95
Commodore 64 £9.95
Available shortly on Amstrad CPC 464

MIKRO-GEN
44 The Broadway, Bracknell, Berks. 0344 427317

Stock Market

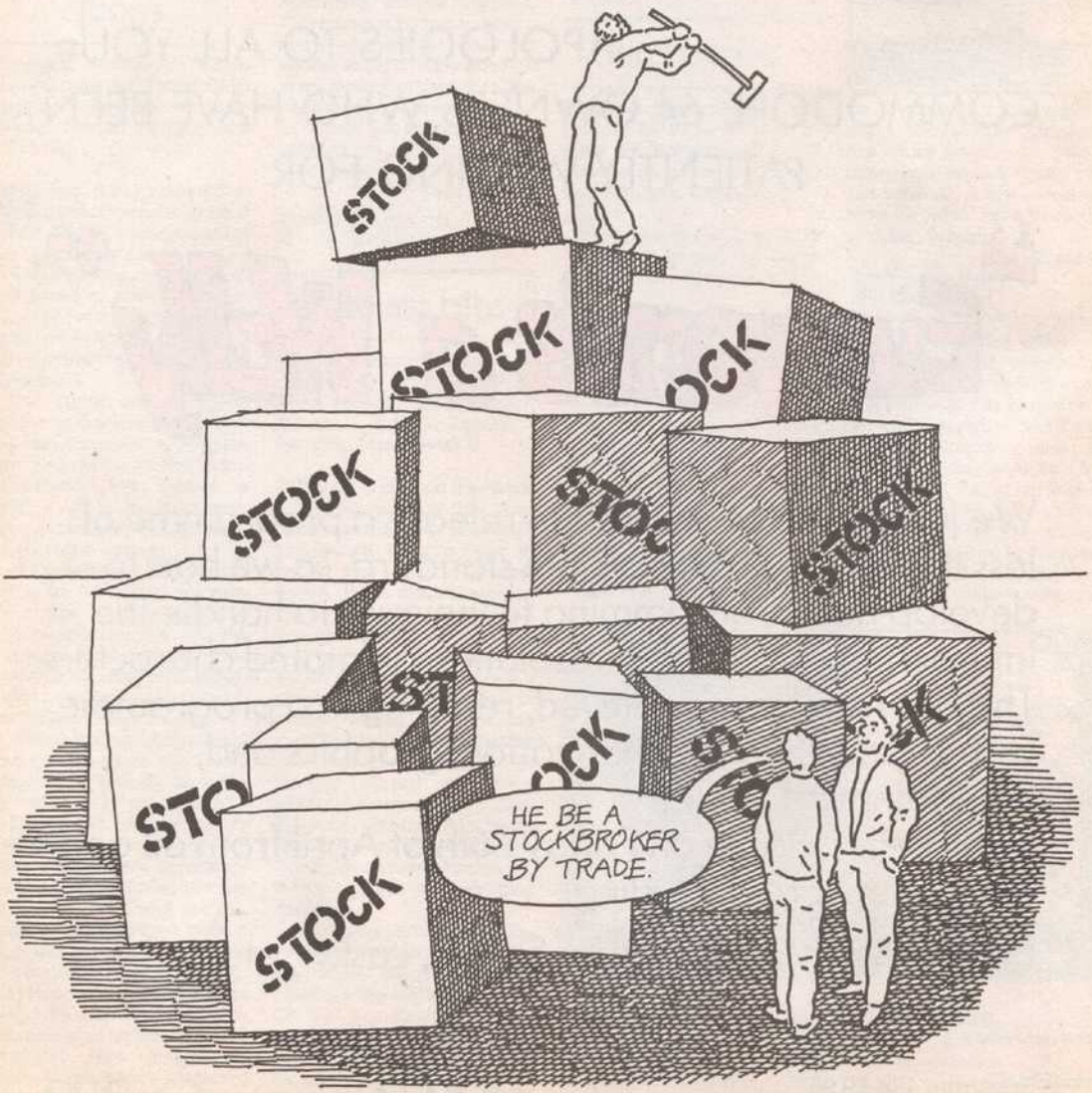
Enjoy the thrills of the stock market in this trading game for the Amstrad CPC 464 by Paul Large

The object of the game is to make money by trading in shares on a small stock market. You start off with £1000 and have 30 days in which to make the largest possible profit.

Each day you have a choice as to what you want to do. Your options are: to buy shares, sell shares, take out a loan, sell up, pay off a loan or visit your accountant. In order to make a large profit, you must buy up shares when they are low, and sell them when they have risen to a high enough price.

Bank loans are useful when you see a real bargain . . . but you have to pay interest for every day you have the money.

NB In Line 280 replace £ by #.



```
10 REM
20 REM            STOCK  MARKET
30 REM            BY PAUL LARGE
40 REM
50 ON BREAK GOSUB 1670
60 INK 3,3:PAPER 3:BORDER 3:INK 1,26:
INK 2,16:PEN 1
70 HZ@=0:HZ@$="AMSTRAD": GOSUB 1500
80 DIM P(10),O(10),C(10)
90 MODE 0:PRINT "BEST SCORE:";:LOCATE
1,8:PRINT"£";HZ@:LOCATE 1,14:PRINT"BY
 ";HZ@$:FOR A=1 TO 3000:NEXT:MODE 1
100 FOR A=1 TO 10:O(A)=0:P(A)=0:C(A)=
0:NEXT
110 D=0:MO=1000:A$=(CHR$(135)+(STRING
$(38,CHR$(131)))+CHR$(139)):B$=(CHR$(
141)+(STRING$(38,CHR$(140)))+CHR$(142
)):IR=5:LD=0:L=0
120 IF L=0 THEN LD=0
130 FOR A=1 TO 10:P(A)=INT(RND*49+A)+
10:NEXT
140 D=D+1:IF D>30 THEN CLS:PRINT "YOU
R 30 DAYS HAVE NOW RUN OUT AND YOU
ARE BEING SENT HOME.":FOR A=1 TO 4000
:NEXT:GOTO 930

150 IR=IR+(RND)-(RND):IF (IR>10) THEN
 IR=10
160 IF (IR<2.5) THEN IR=2.5
170 I$=STR$(IR):I$=MID$(I$,1,4):IR=VA
L(I$)
180 INK 3,3:PAPER 3:BORDER 3:INK 1,26
:INK 2,16:PEN 1
190 IF (L>0) THEN L=L+((L/100)*IR):LD
=LD+1:IF LD=11 THEN 830
200 L=INT(L)
210 FOR A=1 TO 10:C(A)=INT((RND*10+A)
-(RND*10+A)):IF P(A)+C(A)<15 THEN C(A
)=-C(A)
220 P(A)=P(A)+C(A)
230 NEXT

240 CLS:PRINT A$;CHR$(133);" CITY SHA
RE PRICE INDEX - DAY ";D;TAB (40);CHR
$(138);B$;CHR$(133);TAB(9);CHR$(149);
TAB(17);CHR$(149);TAB(28);CHR$(149);T
AB(40);CHR$(138);
250 PRINT CHR$(133);" SHARE ";CHR$(14
9);" PRICE ";CHR$(149);"  CHANGE  ";C
HR$(149);"  YOU OWN  ";CHR$(138);
260 PRINT CHR$(133);TAB(9);CHR$(149);
TAB(17);CHR$(149);TAB(28);CHR$(149);T
AB(40);CHR$(138);
270 FOR A=1 TO 10:C$=" UP   ":IF C(A)
<0 THEN C$=" DOWN ":C(A)=ABS(C(A))
280 PRINT CHR$(133);:PRINT USING "£££
££";A;:PRINT TAB(9);CHR$(149);:PRINT
USING "£££££";P(A);:PRINT TAB(17);CHR
$(149);C$;:PRINT USING"£££";C(A);:PRI
NT TAB(28);CHR$(149);"   ";:PRINT USI
NG "£££££";O(A);:PRINT TAB(40);CHR$(1
38);
290 NEXT

300 PRINT CHR$(133);TAB(9);CHR$(149);
TAB(17);CHR$(149);TAB(28);CHR$(149);T
AB(40);CHR$(138);STRING$(40,CHR$(131)
);
310 PRINT" 1: BUY  SHARES     4: GO H
OME          2: SELL SHARES     5: P
AY OFF LOAN      3: HAVE A LOAN     6
: FINANCIAL UPDATE"
320 PEN 2:PRINT" YOU HAVE £ ";MO;TAB(
21);:PEN 1
330 IF L>0 THEN PRINT "BANK LOAN ";IR
;"%"
340 SOUND 1,40,20,15
350 W$=INKEY$:IF W$="" THEN 350
360 IF W$>"6" OR W$<"1" THEN GOTO 350
370 ON VAL(W$) GOTO 390,530,580,930,9
50,1120
380 GOTO 140
390 REM
400 GOSUB 440
410 IF (MO<(P(SH)*N)) OR ((O(SH)+N)>1
0000) THEN LOCATE 1,25:PRINT "YOU CAN
'T BUY THAT MANY ";:SOUND 1,30,20,5:F
OR A=1 TO 1000:NEXT:LOCATE 1,25:PRINT
 STRING$(40," "):GOTO 140
420 MO=MO-P(SH)*N:O(SH)=O(SH)+N
430 GOTO 380
440 REM
450 LOCATE 1,22:PRINT "WHICH SHARE (1
-10)                    ":INPUT SH
460 IF (SH<1) OR (SH>10) OR (SH<>INT(
SH)) THEN GOTO 440
470 LOCATE 1,24
480 MXX=INT(MO/P(SH)):IF MXX>10000 TH
EN MXX=10000
490 LET WWW=VAL(W$):IF WWW=1 THEN PRI
NT "HOW MANY SHARES  ( MAX.";MXX;")";
:INPUT N
500 IF WWW=2 THEN PRINT "HOW MANY SHA
RES  ( MAX.";O(SH);")";:INPUT N
510 N=INT(N):IF N<0 THEN 440
520 RETURN
530 REM
540 GOSUB 440
550 IF N>O(SH) THEN LOCATE 1,25: PRIN
T "YOU CAN'T SELL THAT MANY. ":FOR A=
1 TO 1000:NEXT:LOCATE 1,25:PRINT STRI
NG$(40," "):GOTO 140
560 O(SH)=O(SH)-N:MO=MO+P(SH)*N
570 GOTO 390
580 REM
590 INK 5,26:BORDER 26
600 INK 6,11
610 MODE 1:PAPER 5:CLS:PAPER 6
620 INK 7,3:PEN 7
630 PRINT CHR$(135); STRING$(38,CHR$(
131));CHR$(139);
640 PRINT CHR$(133);" UNITED CITY BAN
K - LOAN APPLICATION. ";CHR$(138);
650 PRINT CHR$(141); STRING$(38,CHR$(
140));CHR$(142);
660 PAPER 5
670 IF L=0 THEN GOTO 720
680 PEN 4
690 LOCATE 1,5: PRINT"I'M SORRY, BUT
THERE IS ALREADY A LOAN  OF £";L;" WH
ICH YOU HAVE NOT REPAID."
700 LOCATE 1,9:PRINT"YOU TOOK OUT THI
S LOAN";LD;"DAYS AGO."
710 GOTO 1460
720 REM
730 LN=MO*5:LN=LN+INT(RND(1000)):IF L
N>10000 THEN LN=10000
740 LN=LN+(RND*(LN/10))-(RND*(LN/10))
:LN=INT(LN)
750 LOCATE 1,5:PRINT"YOU MAY HAVE A L
OAN OF UP TO: £";LN
760 PRINT:PRINT"A SMALL AMOUNT OF INT
EREST IS CHARGED BYTHE BANK EACH DAY.
THE PRESENT INTEREST  RATE  IS";IR;"%
"
770 PRINT"THIS LOAN MUST BE REPAID WI
THIN 10 DAYS.          ";STRING$(4,CH
R$(208))
780 LOCATE 1,12:PRINT"HOW MUCH WOULD
YOU LIKE TO BORROW ?"
790 LOCATE 1,13:PRINT"       ":LOCATE
 1,13:INPUT L:IF (L>LN) OR (L<0) THEN
 LOCATE 1,20:PRINT "YOU CANNOT HAVE T
HAT MUCH!  ":FOR XL=1 TO 1000:NEXT XL
:LOCATE 1,20:PRINT STRING$(40," "):GO
TO  790
800 L=INT(L):MO=MO+L
810 PAPER 3:CLS
820 GOTO 140
830 REM ££ OUT OF TIME ££
840 INK 5,9:BORDER 9:PAPER 5:CLS
850 INK 6,21:PEN 6
860 LOCATE 1,3:PRINT" THE TEN DAYS WH
ICH YOU WERE GIVEN TO    PAY OFF YOUR
 BANK LOAN OF £";LN;:PRINT" HAS NOW R
UN OUT.":LOCATE 1,8:PRINT" THE BANK H
AS TAKEN ALL YOUR MONEY AND  SHARES
TO PAY THIS AMOUNT OFF."
870 SOUND 1,100,50,15
880 LOCATE 1,22:PRINT "PRESS ANY KEY"
890 L=0:MO=0:FOR A=1 TO 10:O(A)=0:NEX
T
900 AA$=INKEY$:IF AA$="" THEN 900
910 GOTO 1300
920 STOP
930 REM
940 GOTO 1300
950 REM
960 BORDER 3
970 MODE 1:PAPER 3:CLS:PAPER 8
980 PEN 1
990 PRINT CHR$(135); STRING$(38,CHR$(
131));CHR$(139);
1000 PRINT CHR$(133);" UNITED CITY BA
NK - LOAN REPAYMENTS.  ";CHR$(138);
1010 PRINT CHR$(141); STRING$(38,CHR$
(140));CHR$(142);
1020 PAPER 3
1030 LOCATE 1,5:IF L=0 THEN PRINT "YO
U HAVE NOT EVEN TAKEN OUT A LOAN FROM
 THIS BANK.":SOUND 1,200,20,15:GOTO 1
460
1040 PRINT"YOU STILL HAVE A TOTAL OF
£";L;"OF":PRINT"YOUR LOAN TO REPAY.TH
IS LOAN WAS TAKEN  OUT";LD;"DAYS AGO.
"
1050 LOCATE 1,15:PRINT"YOU HAVE £";MO
:LOCATE 1,17:PRINT"HOW MUCH DO YOU WA
NT TO REPAY ?":LOCATE 1,20:INPUT LA
1060 LA=INT(LA)
1070 IF (LA>L) OR (LA<0) OR (LA>MO) T
HEN CLS:GOTO 950
1080 IF LA=L THEN L=0:LD=0:MO=MO-LA:G
OTO 380
1090 L=L-LA:MO=MO-LA:LOCATE 1,22:PRIN
T"YOU STILL HAVE £";L:PRINT"OF YOUR L
OAN TO REPAY."
1100 FOR XL=1 TO 1000:NEXT
1110 GOTO 380
1120 REM
```

```
1130 INK 5,26:BORDER 26
1140 INK 6,11
1150 MODE 1:PAPER 5:CLS:PAPER 6
1160 INK 7,3:PEN 7
1170 PRINT A$;CHR$(133);"ACCOUNTANTS
FINANCIAL REPORT - DAY";D;TAB(40);CHR
$(138);B$
1180 PAPER 5
1190 LOCATE 1,7:PRINT"YOU HAVE.....
.....£";MO
1200 LOCATE 1,9:PRINT"BANK LOANS.....
.....£";L
1210 LOCATE 1,11:PRINT"DAYS SINCE LOA
N......";LD
1220 OO=0:VV=0:FOR XL=1 TO 10:OO=OO+O
(XL):VV=VV+((P(XL))*(O(XL))):NEXT
1230 LOCATE 1,15:PRINT"NUMBER OF SHAR
ES.....";OO
1240 LOCATE 1,17:PRINT"VALUE OF SHAR
ES....£";VV
1250 LOCATE 1,21:PRINT"TOTAL ";
1260 PR=MO-L+VV-1000:IF PR>=0 THEN PR
INT "PROFIT";
1270 IF PR<0 THEN PRINT " LOSS ";
1280 PRINT " OF.....£";ABS(PR)
1290 GOTO 1460
1300 REM
1310 CLS:LOCATE 1,13:PRINT"
     GAME OVER"
1320 FOR A=1 TO 2000:NEXT
1330 REM
1340 LET PZZ=MO-1000-L
1350 FOR A=1 TO 10:PZZ=PZZ+(O(A)*P(A)
):NEXT:PZZ=INT(PZZ)
1360 INK 3,3:PAPER 3:BORDER 3:INK 1,2
6:INK 2,16:PEN 1:CLS
1370 PRINT"I HAVE COUNTED UP YOUR MON
EY, PAID OFF  ALL YOUR DEBTS AND SOLD
 OFF YOUR SHARES. ":PRINT"YOU HAVE MA
DE A ";
1380 PZZ$="PROFIT":IF PZZ<0 THEN PZZ$
="LOSS"
1390 PRINT PZZ$;" OF :-":PRINT:PRINT
TAB (15);"£";ABS(PZZ)
1400 FOR A=1 TO 2000:NEXT
1410 IF PZZ>HZQ THEN GOSUB 1630
1420 LOCATE 1,22:INPUT"DO YOU WANT AN
OTHER GO (Y/N) ";YY$
1430 IF YY$="Y" OR YY$="y" THEN GOTO
90
1440 MODE 0:CLS:PRINT"STOCK MARKET"
1450 GOTO 1450
1460 LOCATE 1,24:PRINT "<  PRESS SP
ACE  BAR  TO  CONTINUE.  >"
1470 G$=INKEY$:IF G$="" THEN 1470
1480 PAPER 3:BORDER 3:CLS
1490 GOTO 140
1500 REM
1510 MODE 0:LOCATE 1,10:PRINT"    STO
CK MARKET    "
1520 SOUND 1,200,20,15
1530 LOCATE 1,22:PRINT"PRESS ANY KEY.
....."
1540 AA$=INKEY$:IF AA$="" THEN 1540
1550 MODE 1:CLS:PRINT"STOCK MARKET
          BY PAUL LARGE."
1560 PRINT:PRINT:PRINT:PRINT"IN THIS
GAME YOU MUST BUY & SELL SHARES ON A
SMALL STOCK MARKET. YOU START OFF  WI
TH £ 1000 ,BUT WITH SKILL THIS CAN BE
 INCREASED MANY TIMES. THE CITY BANK
WILLBE ABLE TO OFFER YOU LOANS, BUT Y
OU MUSTENSURE THAT THESE ARE REPA
1570 PRINT"DAYS OR YOU WILL BE IN TRO
UBLE.          AN ACCOUNTANTS REPORT I
S AVAILABLE TO  GIVE YOU AN IDEA OF
HOW YOU ARE DOING,  AND THE MAXIMUM T
ERM OF TRADING IS 30  DAYS, AFTER WH
ICH YOU WILL BE SENT HOME."
1580 PRINT"YOU MAY GO HOME AT ANY TIM
E, AND IF YOU DO SO, YOUR TOTAL PROFI
T OR LOSS WILL BECALCULATED"
1590 PRINT:PRINT"THE BEST OF LUCK..."
1600 LOCATE 1,24:PRINT"PRESS ANY KEY
TO PLAY THE GAME....."
1610 AA$=INKEY$:IF AA$="" THEN 1610
1620 RETURN
1630 CLS:PRINT "PROFIT OF £";PZZ
1640 LOCATE 1,10:PRINT"WELL DONE...":
PRINT:PRINT:PRINT:PRINT"YOU HAVE BEAT
EN THE HIGHEST SCORE.ENTER YOUR NAME
(MAX. 10 LETTERS)."
1650 HZQ=PZZ
1660 LOCATE 1,20:INPUT HZQ$:HZQ$=HZQ$
+"          ":HZQ$=MID$(HZQ$,1,10):CL
S:RETURN
1670 INK 3,3:PAPER 3:BORDER 3:INK 1,2
6:INK 2,16:PEN 1:MODE 1:CLS:PRINT"STO
CK MARKET"
```


HISOFT

ULTRAKIT £9·45

The most powerful toolkit yet for ZX BASIC. All the features you will ever need: AUTO insert, full RENUMBER, block DELETE, CLOCK, ALARM, error trapping, break trapping. Full TRACE with single-step and much, much more. Makes ZX BASIC easy-to-use and powerful.

DEVPAC £14

An excellent assembler, an advanced line-editor, a comprehensive disassembler and a superb 'front panel' debugger all in one package. Used by many leading software houses to write their games. "Buy it!" Adam Denning 1984.

PASCAL £25

A powerful and almost full implementation of Pascal - not a Tiny Pascal. A valuable educational and development tool, programs typically run 40 times faster than a BASIC equivalent. Spectrum version includes Turtle Graphics package. " I haven't seen any other compiler that could match Hisoft's Pascal"

All prices, UK delivered, relate to 48K ZX Spectrum versions.

HISOFT
180 High Street North
Dunstable, Beds. LU6 1AT
Tel: (0582) 696421

HISOFT

presents

FONT 464
for the
AMSTRAD CPC 464

FONT 464 *is a font designer and character generator especially developed for the CPC 464 microcomputer.*

Design your own character fonts and graphic symbols with this very friendly and powerful package.

FONT 464 *allows you to create a new design or amend an existing one using set, reset, invert, reflect, rotate, inverse and even animation!*

Load and save character sets to/from tape, use the new character(s) from BASIC, design your own animated graphics – all this and more with **FONT 464**.

FONT 464 *is supplied with three interesting and amusing character sets for you to experiment with.*

✱ *All this power for: £7.95 inclusive* ✱

We also have available for the Amstrad CPC 464:

Hisoft Devpac – our full Z80 assembler and disassembler/debugger with more features than you'll ever need.

Hisoft Pascal – a virtually full implementation of Standard Pascal. Compiles and executes incredibly quickly.

Please write to Hisoft for more details of Pascal and Devpac on the CPC 464 or contact Amsoft with your order.

SUNARO

AMSTRAD LATEST TITLES		AMSTRAD AMSOFT TITLES		SPECTRUM	
Survivor	6.25	Roland On The Ropes	7.50	Match Day	6.75
Software Star	6.95	Roland Ahoy	7.50	Sam Stoat	5.95
Dark Star	6.95	Roland In The Cave	7.50	Monty Is Innocent	5.95
Fighter Pilot	7.85	Home Runner	7.50	Raid Over Moscow	6.75
Heathrow ATC	6.95	Haunted Hedges	7.50	Ghostbusters	8.50
Chopper Squad	5.25	3D Invaders	7.50	Deus Ex Machina	12.75
Special Operations	6.25	Space Hawks	7.50	Skool Daze	5.25
Battle For Midway	8.75	Harrier Attack	7.50	Zaxxon	6.75
Sorcery	7.85	Laser Warp	7.50	Bruce Lee	6.75
Machine Code Tutor	13.25	Hunter Killer	7.50	Spy Hunter	6.75
Emerald Isle	7.85	Code Name Matt	7.50	Everyones a Wally	8.50
Defend or Die	6.95	Atom Smasher	7.50		
Technician Ted	6.95	Spannerman	7.50	CBM 64	
Music Composer	8.75	Quack A Jack	7.50	Buck Rogers	6.75
The Hobbit	13.25	Grand Prix Driver	7.50	Hunchback II	6.95
Jewels Of Babylon	5.25	Snooker	7.50	Kong Strikes Back	6.95
Message Andromeda	5.25	Mutant Monty	7.50	Impossible Mission	7.85
Forest At World's End	5.25	Centre Court	7.50	F-15 Strike Eagle	13.25
Fruity Frank	6.25			Currah Microspeech	25.00
Steve Davis Snooker	6.95	ATARI		Regarda to Broad Street	6.95
Flight Path 737	6.25	Pole Position	48k cass 8.75	Baseball World Series	6.95
Erik The Viking	8.75	Smash Hits 1	32k cass 13.25		
American Football	8.75	Smash Hits 2	32k cass 13.25	**Postage & VAT included**	
Heroes of Khan	5.25	Smash Hits 3	32k cass 13.25	**SUNARO SOFTWARE (PCW8),**	
World Cup Football	8.95	Ghostbusters Disk	13.25	**PO BOX 78, MACCLESFIELD**	
Moon Buggy	6.25	Drop Zone	48k cass 8.75	**CHES SK10 3PF**	

NEW TITLES AVAILABLE IMMEDIATELY UPON RELEASE PD201

POPULAR Computing WEEKLY Back Issues

Almost all the copies of **PCW** that you missed can still be bought as back issues for only 50p, including postage and packing.

An **index** of the contents of the 36 issues published in 1982 is now available from the Publishers for only £1.20. It includes full details of all programs, routines, reviews and news that you might have missed.

Please send me the following back issues at 50p each:

..... Total £.....

Please send me a copy of the 1983 PCW Index at £1.20 ☐

I enclose a cheque postal order for £ .....

Name .....

Address .....

.....

.....

Please return to Back Issues, PCW, 12-13 Little Newport Street, London WC2R 3LD. HA3

POWERFUL UTILITIES

AMSTRAD SPEEDMASTER FAST LOAD UTILITY

Fed up with waiting for programs to LOAD? Speedmaster is the answer. Convert **all** your software to load at **double** speed (choice of save speeds) **100% successful**. Incorporates a sophisticated header reader. An **invaluable** piece of software. **ONLY £7.95**

Tape to disc utility due shortly.

B.B.C. TAPE TO DISC UTILITY

A **very useful** utility to help shift those stubborn tape programs onto **your own discs**. Produces a shift code to relocate the memory position of programs to suit the DFS workspace.

ONLY £9.95

ATARI TAPE TO DISC UTILITY

A dual purpose program that allows single stage boot programs to be shifted onto disc. **Very easy to use** with menu options. Includes output to tape. Works on **all models.**

ONLY £9.95

COMMODORE 64

THE BEST RANGE OF UTILITIES FOR THE 64. WRITTEN BY PROFESSIONALS - SOLD BY PROFESSIONALS

DISC DISECTOR V2.0

At last a really powerful disc copier and utility program. Incorporates a range of powerful programs. Includes **"Fastcopy"**. Takes just **6 minutes** to read and write a **whole disc. "Error Copy"** automatically reads and writes **all** error types, now you can make a security back up of those expensive business programs. **"Quickdisc"** more than **halves** disc loading time. **very** useful. **"File Copier"** allows **selective** copying from directory. **"Track and Sector"** a slower but very thorough program. Also includes the following useful utilities: **Viewbam, Fast Format, Unscratch, Disc Monitor, Menu Maker, Index, Retitle, Rename, Szratcher, Disc to Tape** and **Tidy**. If you have a 1541 you **must** have Disc Disector. Supplied on disc with full instructions.

ONLY £29.95

QUICKDISC

Incorporating Menu Maker

NOW EVEN FASTER

Speed up your 1541 disc drive with this **new** program. Loads most programs at **6 times** normal speed. A flexible package that allows you to incorporate a **menu and fast loading** on **your own discs**. Also includes a file exchanger for programs put on disc with **"Disco"** (THE tape to disc utility), another way of making fast load disc programs. A **must** for all disc drive users.

ONLY £11.95

FASTBACK

Fast Load Utility

Convert your slow loading software to **high speed load** with Fastback. The **most sophisticated** program of its type allows you to produce **"turbo"** loading versions of most single and **multipart** software that load **independantly** of Fastback. **Simple** to use **no programming skill needed**. Example: Load "The Hobbit" or "Manic Miner" in **150 secs**. Tried and trusted over 2000 sold.

A very professional program.

ONLY £9.95

DISCO

THE TAPE TO DISC UTILITY

We **guarantee** that this is the **best** tape to disc utility on the market. **Very easy to use no programming knowledge needed**. Automatically handles device numbers and multi part programs. Programs **auto load** and **run** once transferred and can also be made to **fastload** with **Quickdisc**. Handy for making your own disc programs auto run.

ONLY £9.95

DOUBLER

DOUBLER

The **amazing** new cassette port adaptor for the '64, with **special software**. Requires access to two cassette units but is **100% successful, even with "fast" loaders**. They said it couldn't be done.

ONLY £12.95

SPECTRUM

Yes, after spectacular success on the 64 Doubler is now available for the **Spectrum**. Tests have proved **100% successful.**

ONLY £12.95

PATENT APPLIED FOR

ROCKET

Fed up waiting for programs to load and save? Rocket is a utility for the programmer, speeds up loading and saving by about **8 times** while still allowing for normal speed operations. **Does not** affect the speed of BASIC as no wedge is used. Programs can also be saved with high speed system to **reload independantly**. A must for serious programmers who have no disc drive.

ONLY £7.95

BIGMOUTH

The **superb** new **speech synthesis** program for the '64. Uses "speak" as a basic command. **Very easy to use.** Can be incorporated into your basic programs. Words are entered in phonetic English, ie. spelt as they sound. Therefore vocabulary is **unlimited**. **Great fun** and good for educational purposes.

ONLY £7.95

COMMODORE CONNEXION

Connect any "Centronics" type printer to your 64. Price includes lead and software on cassette with special disc conversion program.

Simple to use and very reasonably priced

ONLY £14.95

DATA RECORDER

A dedicated data recorder designed to use on the CBM 64 or VIC 20. Specification is CBN but with **pause button.** Model available for the PLUS4 or 16 at same price

SATISFACTION GUARANTEED.

ONLY £25.95

3M SCOTCH DISCS

Lifetime guarantee Box of Ten

SS/DD. **£16.00** DS/DD. **£23.00**

All prices include P&P and VAT. Send cheque, Postal Order or Credit Card No. Credit Card orders accepted by phone. Callers welcome. Wide range of goods stocked. Trade enquiries welcome. Export orders serviced. Please write for your requirements. Outside Europe £7.00 for air mail. Mail order to Lostwax Ltd. We give VAT registration number when ordering goods.

MICRO CENTRE
BRIDGE STREET, EVESHAM, WORCESTERSHIRE
Tel: 0386 49641

MICRO CENTRE
1756 PERSHORE ROAD, COTTERIDGE, BIRMINGHAM.
Tel: 021 458 4564

NEW

-Commodore 64-

TURBO-BREAKER

AT LAST, Transfer Turbo games to Disk
Blank screen, Flashing and picture
screen turbos by most software houses
Easy to use.....£10.95

******** TURBO-SAVER *********

Make easy Turbo back up copies of
your slow load games, no user knowledge
needed, easy to use.....£8.00

******* TRANSFER - MK2 ******

Transfer most slow load games to Disk
Simple to use, and needs no user
knowledge, or skill.....£8.00

******* DISK - TURBO **********

Make your disk games load faster,
45secs instead of 2mins, does no harm
to your drive.....£8.00

********DISKOPY **********

A Selective disk copier, fast and very
easy to use.....£7.00

******* DISK-DOCTOR *********

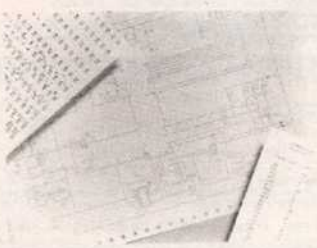
A Disk editor, alter any part of the
disk, recover a scratched file£8.00

ARROW MICRO SERVICES

20 Portmeadow Walk
London SE2

PD100

CIRKWIK
Schematic drawing on the
BBC micro



A lightpen or trackerball driven CAD package orientated to the production of schematic drawing, such as circuit diagrams, flow charts, power systems, pipework diagrams, fluid logic diagrams and many similar professional and engineering applications

- Lightpen or trackerball driven
- Virtual screen 8x the BBC's mode 4
- Uses standard dot matrix printer in dual-density graphics mode to produce excellent quality diagrams
- Automatic parts list generation
- Up to 640 symbols may be in use in any one diagram
- Total symbol library unlimited in size
- Create your own symbols with the lightpen on a highly magnified scale
- Many electronic symbols already included in package

Datapen

CIRKWIK program for lightpen and trackerball	£24.95 inc VAT & P/P
CIRKWIK program for lightpen only	£19.95 inc VAT & P/P
DATAPEN lightpen	£25.00 inc VAT & P/P
MARCONI Trackerball	£59.50 inc VAT & P/P

DATAPEN MICROTECHNOLOGY LTD.
Dept. 10, Kingsclere Road, Overton, Hants. RG25 3JB
TEL: (0256) 770488

Getting into top gear

Speed up your Basic programs using this Compiler for 48K Spectrum by ***A Mehmood***

One main draw-back of programs written in Basic is the speed they run at. You must have noticed that even some of the simplest of programs may be slow and sluggish. The only way to really overcome the problem of speed is to convert the programs into machine code. This may not be such a hard task for someone who is familiar with assembler but for someone who has no or very little such knowledge it becomes an almost impossible task. This is where many people can benefit by using a compiler.

This compiler interprets many (but not all) of the commands, functions and statements used in Basic to their machine code equivalents. When this code is run, you will find your program runs much faster than its Basic equivalent.

Commands, Functions and Statements supported are as follows:

At	Attr	In	Ink
Beep	Border	Inkey$	Int
Chr$	Cls	Inverse	Let
Code	Draw	Out	Over
Flash	Goto	Pause	Peek
Gosub	If	Plot	Point
		Poke	Print
		Rem	Return
		Rnd	Stop
		Tab	Then
		Usr	Paper
		Bright	

The following symbols (Punctuation/Arithmetic) are also supported:

,		;	
:		(	
)		/	
*		+	
-		=	
<		>	
<=		>=	
<>		'	

All the above Commands, Functions, Statements and symbols can be used in exactly the same way as they are in standard Sinclair Basic, with the following exceptions.

Inkeys – To read a key, the *Inkey$* command must take up the following format:
If Code Inkey$ = x Then ... x being the character code of the key to be read. This can be found by looking in Chapter 26, appendix A of the Spectrum manual. Eg, five has the code of 53, nine has the code fo 57, etc

Numbers – All numbers used at any time in the program should be in the range of 0-65535. Any negative number will hold the value of – *65536-x*, *x* being the negative number. It should also be noted that only integers (whole numbers) are allowed or stored after calculation.

Beep – The *Beep* command has the format as in standard Sinclair Basic (eg, *Beep x,y)* except in that *x* holds the duration of the sound in micro seconds (approx) rather than holding the duration in seconds. Rather than *y* holding the value of the note to be played, *y* holds the result of the following equation: frequency * time (in seconds). Using this method more variety of sounds can be produced.

Next week, the remainder of the Basic Listing and how to compile your own programs.

```
   1 REM xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxx
  2 GO TO VAL "900"
  10 DEF FN c(c)=VAL "48"+c+(VAL "7" AND c)>VAL "9")
  11 LET a=LEN a$/w1
  12 LET c=INT (a/w1): LET d=a-c*w1: LET c$=CHR$ d+CHR$ c: RETURN
  15 DEF FN a(a)=PEEK a+w1+PEEK (a+w1
  16 GO SUB w7: LET R$=CHR$ PEEK P: LET VAR=(FN V(CODE R$)-VAL "97")+w1: LET P=P
+w1: GO SUB w8: IF PEEK P=CODE "$" THEN  LET x$="String functions not available":
 GO TO wf
  17 IF CHR$ PEEK p>="0" AND CHR$ PEEK P<="9" THEN  LET var=var+VAL "52": GO SUB
 w7
  19 RETURN
  20 LET P=P+w
  30 REM expression evaluator
  31 DEF FN v(v)=v+VAL "32"*(v<VAL "97")
  35 LET B$=M$
  37 LET d$=""
  40 LET e$=""
  41 REM each number
  49 LET e$=" "
  50 GO SUB w8: LET R$=CHR$ PEEK P
  51 LET r$=CHR$ PEEK p: IF r$<K$ OR r$=CHR$ VAL "203" OR (r$)"9" AND r$<"A") OR
R$=CHR$ VAL "204" OR r$="." OR r$="," OR R$=")" OR (r$)="<" AND r$<>"<") THEN
  RETURN
  52 IF r$)"*" AND r$<"0" THEN  IF E$(1)<>"" THEN  IF E$(1)<>CHR$ VAL "186" AND e$(
1))="" THEN  RETURN
  53 IF r$)"*" AND r$<"0" THEN  LET o$=R$: LET p=p+w: GO TO w6
  55 IF r$)=CHR$ VAL "165" AND R$<>CHR$ VAL "166" THEN  GO TO VAL "110"
  57 IF r$=")" THEN  IF e$<>"" THEN  LET p=p+w: RETURN
  58 IF r$="(" THEN  LET p=p+w: GO TO w6
  59 IF r$="(" THEN  GO TO VAL "111"
  60 IF r$>="A" THEN  GO TO VAL "90"
  63 LET p=p+w: IF PEEK p<>VAL "14" THEN  GO TO VAL "63"
  64 IF PEEK (p+w)<>PI-PI THEN  LET x$="Number out of range": GO TO wf
  70 LET p=p+VAL "5"
  72 LET b$=b$+"11"
  74 FOR p=p TO p+w: LET A=PEEK p: GO SUB w6
  76 LET b$=b$+c$
  77 NEXT p
  80 GO SUB w9
  83 GO SUB w7
  85 GO TO w6
  90 LET v=FN v(CODE r$)
  91 GO SUB w7: LET A=(v-VAL "97")*w1+(VAL "52" AND CHR$ PEEK P>="0" AND CHR$ PE
EK P<="9")
  93 GO SUB w8: LET B$=b$+"EDSB"+C$+N$: LET P=P-(CHR$ PEEK P<"0" OR CHR$ PEEK p>
"9")
  94 GO TO VAL "80"
  95 LET P=P+w
  96 IF CHR$ PEEK p<=" " AND CHR$ PEEK p<>k$ THEN  GO TO w7
  97 RETURN
 100 IF o$=" " OR o$="+" THEN  LET B$=B$+"19": RETURN
 101 IF o$="-" THEN  LET B$=B$+"A7EDS2": RETURN
 102 IF o$="*" THEN  LET B$=B$+"CDD05C": RETURN
 103 IF o$="." THEN  LET x$="Only intergers allowed.": GO TO wf
 104 IF o$>"/" THEN  STOP
 105 LET B$=B$+"CDE05C": RETURN
 110 IF R$=CHR$ VAL "189" OR R$=CHR$ VAL "186" THEN  LET P=P+w: GO TO w6
 112 PRINT TAB 11;R$;TAB VAL "8";"IN "line
 114 GO SUB w7
 120 LET c$=o$+c$
 121 IF R$)=CHR$ VAL "217" AND R$<=CHR$ VAL "222" THEN  GO SUB VAL "183": LET P=
P+w: GO TO w6
 122 IF r$<>CHR$ VAL "190" THEN  GO TO VAL "130"
 123 LET e$=CHR$ VAL "190"+e$
 125 LET b$=b$+"E5"+M$: GO SUB VAL "49"
 127 LET B$=B$+"3E1600E1"
 128 LET E$=E$(w1 TO ): LET o$=d$(w): LET d$=d$(w1 TO ): GO SUB w9: GO TO w6
 130 IF r$<>CHR$ 192 THEN  GO TO VAL "140"
 132 LET b$=b$+"E5CD"; LET e$=CHR$ 192+e$
 133 GO SUB VAL "192"
 134 LET B$=B$+"E1"
 135 GO SUB w9: GO TO w6
 136 LET E$=CHR$ VAL "186"+E$: LET B$=B$+"E5"+M$: GO SUB w5: LET B$=B$+"E3E1": G
O TO VAL "128"
 140 IF R$="(" THEN  GO TO VAL "136"
 141 IF r$<>CHR$ VAL "165" THEN  GO TO VAL "150"
 142 LET b$=b$+"E5C10F00CD3450E1": GO TO w6
 150 IF r$<>CHR$ VAL "191" THEN  GO TO VAL "160"
 151 LET e$=CHR$ VAL "191"+e$: LET d$=o$+d$: LET b$=b$+"E5"+M$: GO SUB w5: LET B
$=B$+"444DE1EDB01600": GO TO w6
 160 IF r$<>CHR$ VAL "175" THEN  GO TO VAL "170"
 161 LET E$=E$+CHR$ VAL "175": IF PEEK P<>VAL "166" THEN  LET x$="CODE INKEY$ er
ror": GO TO wf
 163 LET b$=b$+"FFEDSB08SC1600": LET P=P+w: GO TO w6
 164 LET E$=E$+CHR$ VAL "185": LET B$=B$+"E5"+M$: GO SUB w5: LET B$=B$+"CD3450E1
": GO TO w6
 170 IF r$=CHR$ VAL "185" THEN  GO TO VAL "164"
 171 IF r$<>CHR$ VAL "171" THEN  GO TO VAL "177"
 172 LET b$=b$+"E5"+M$: LET P=P+w: LET E$=CHR$ VAL "171"+E$: GO SUB w5: LET B$=B
$+"2929292929": LET P=P+w: GO SUB w5
 175 LET B$=B$+"1100SB195E1600E1": GO TO w6
 176 LET B$=B$+CHR$ VAL "169": LET B$=b$+"CSE5"+M$: GO SUB w7: GO SUB w5: LET B$
=b$+"4D": LET B$=B$+M$: GO SUB w7: GO SUB w5: LET B$=b$+"45CDEE22CDDS2D16005FE1C
1": GO TO w6
 177 IF R$=CHR$ VAL "168" THEN  GO TO VAL "310"
 180 IF r$=CHR$ VAL "169" THEN  GO TO VAL "176"
 181 LET x$="Invalid function": GO TO wf
 183 LET s$=r$
 185 LET A=CODE R$-w: GO SUB w8: LET A$=A$+"3E"+C$+"D7": GO SUB w6-(q$=r$): LET
A$=A$+B$+P$: LET B$=M$: GO SUB w8: IF a$>CHR$ VAL "221" THEN  LET b$="3A915CAF
E60587B1329I5C"+b$: RETURN
 186 LET x$=a$+"3ABF5CD28D5C": RETURN
 191 LET C=INT (A/VAL "16"): LET D=A-C*VAL "16": LET C=FN C(C): LET D=FN C(D): L
ET C$=CHR$ C+CHR$ D: RETURN
```

```
 192 GO SUB w8: LET r$=CHR$ PEEK p: IF R$<"0" OR R$>"9" THEN  LET x$="Only numbe
rs allowed for  GO TO          GO SUB and USR ": GO TO wf
 195 LET P=P+VAL "1": IF PEEK P<>VAL "14" THEN  GO TO VAL "195"
 196 LET p=p+w2: LET a=PEEK p: IF e$="" THEN  RETURN
 198 GO SUB wb: LET b$=b$+c$: LET a=PEEK (p+w): GO SUB wb: LET b$=b$+c$: LET p=p
+w1: RETURN
 201 IF P>=FN A(VAL "23627")-VAL "1" THEN  GO SUB VAL "830": PRINT TAB VAL "12";
"COMPILED.": GO TO VAL "915"
 202 IF R$=k$ THEN  LET s=w: LET P=P+w: LET QQ=P: GO SUB VAL "11": LET l$=l$+CHR
$ PEEK P+CHR$ PEEK (P+w)+C$: LET LINE=PEEK P*wd+PEEK (p+w): LET P=P+VAL "4"
 210 IF R$=":" THEN  LET s=s+w: LET P=P+w
 215 GO SUB w8
 220 POKE 23692,-1: LET R$=CHR$ PEEK P: LET q$=r$: PRINT r$;TAB 8;"IN ";line: IF
 R$=CHR$ VAL "241" THEN  GO TO VAL "600"
 221 IF R$=CHR$ VAL "250" THEN  GO TO VAL "620"
 222 IF R$=CHR$ VAL "245" THEN  GO TO VAL "700"
 223 IF R$=CHR$ VAL "246" THEN  GO TO VAL "760"
 224 IF R$=CHR$ VAL "244" OR R$=CHR$ VAL "223" THEN  GO TO VAL "765"
 225 IF R$>=CHR$ VAL "217" AND R$<=CHR$ VAL "222" THEN  GO SUB VAL "183": GO TO
we
 227 IF R$=CHR$ VAL "215" OR R$=CHR$ VAL "252" THEN  GO TO VAL "770"
 228 IF R$=CHR$ VAL "251" THEN  LET A$=A$+"3A915C328F5CCDAF0D": GO TO VAL "300"
 229 IF R$=CHR$ VAL "236" OR R$=CHR$ VAL "237" THEN  LET A$=A$+("CD" AND R$=CHR$
 VAL "237")+("C3" AND R$=CHR$ VAL "236"): LET C$="": GO TO VAL "645"
 230 IF R$=CHR$ VAL "231" THEN  GO TO VAL "772"
 231 IF R$=CHR$ VAL "226" THEN  LET A$=A$+"CF08": GO TO VAL "300"
 232 IF R$=CHR$ VAL "234" THEN  GO TO VAL "280"
 235 IF R$=CHR$ VAL "242" THEN  GO TO VAL "833"
 245 IF r$=CHR$ VAL "254" THEN  LET a$=a$+"C9": GO TO VAL "300"
 270 LET x$=r$+" INVALID Command": GO TO wf
 280 LET QQ=QQ+w2: LET A=PEEK QQ*wd+PEEK (QQ-w): LET P=QQ+A
 282 LET R$=K$: GO TO we
 299 LET x$="COMMAND"+R$+" INVALID": GO TO wf
```


CHEAPEST SOFTWARE

SPECTRUM	RRP	Our Price	COMMODORE	RRP	Our PRICE
Shadow Fire*	9.95	7.46	Shadow Fire*	9.95	7.46
Gyron*	9.95	7.46	Impossible Mission	8.95	6.71
Alien 8	9.95	7.46	Pit Stop II (Free Poster)*	9.95	7.46
Knight Lore	9.95	7.46	Tir na Nog	9.95	7.46
Everyone's A Walley	9.95	7.46	Slap Shot	8.95	6.71
Moon Cresta	6.95	5.21	Gremlins	9.95	7.46
Dragon Torc (Avalon II)	7.95	5.96	World Series Baseball	7.95	5.96
Mega Hits (10 Top Titles)	19.95	14.96	Mega Hits (10 Top Titles)	19.95	14.96
Technician Ted	5.95	4.46	Moon Cresta	6.95	5.21
Bruce Lee	7.95	5.96	Ghostbusters	10.99	8.24
Spy Hunter	7.95	5.96	Regards to Broad St.	7.95	5.96
Gremlins	9.95	7.46	Archon*	11.95	9.95
Grand National	6.95	5.21	Lode Runner (Free Poster)	9.95	8.25
Chuckie Egg 2	6.90	5.18	Super Pipe Line II	8.90	6.68
Starion (Free Poster)*	7.95	5.96	Pole Position	9.95	7.46
Brian Jacks Superstar	7.95	5.96	Super Huey	11.95	8.96
Wizards Lair	6.95	5.21	Brian Jacks Superstar	8.95	6.71
Fantastic Voyage	6.95	5.21	Blagger Goes to Hollywood	9.95	7.46
World Series Baseball	6.95	5.21	Breakdance	8.95	7.50
Sherlock Holmes	14.95	9.99	Rock 'N' Bolt	10.99	8.24
Valhalla	14.95	4.99	Spitfire 40	9.95	7.95
Gt. Space Race	14.95	4.99	Super Gran	9.95	7.46
Tasword II*	13.95	10.46	**One on One** (Free Poster)	9.95	8.50
Formula 1	7.95	5.96	**BBC**		
The Quill	14.95	11.21	Sabre Wulf	9.95	7.46
Skool Daze	5.95	4.45	**AMSTRAD**		
Project Future	6.95	5.21	Ghostbusters*	10.99	8.24
Brian Bloodaxe	6.95	5.21	Software Star	7.95	5.96
Death Star Interceptor	7.95	5.96	Daley's Decath	6.95	6.71
Mini Office*	5.95	4.46	Millionaire	6.95	5.21
Super Gran	9.95	7.46	Kong Strikes Back	8.95	6.71
911TS	7.95	5.96	Technician Ted	7.95	5.96
Ghostbusters	9.95	7.46			

* Highly recommended

P&P inc. in price UK

75p per tape in Europe £1.00 per tape elsewhere

Send large SAE for full list (state machine)

All computers catered for

When ordering send cheque/PO to:

Bargain Software (Dept PCW5)

10 Melody Court, Stonehill Rd Estate, London W4 3AW

Ring 01-995 2763 for special offers

PD191

The Adventurers Club Ltd.

64c Menelik Road, London NW2 3RH. Telephone: 01-794 1261

£10,000 PRIZES ON OFFER

SPECIAL INTRODUCTORY OFFER

THE SEARCH IS ON! FOR THE MASTER ADVENTURER 1985

WE OFFER:

★ The Master Adventurer Trophy Competition
★ Monthly Member's Dossier with reviews, maps, tips, solutions, new releases etc . . .
★ Unlimited help through our phone-in helpline
★ Discounted software
★ Members own games marketed for royalties
★ AND MANY OTHER SERVICES

SPECIAL INTRODUCTORY OFFER

~~£10.95~~ £9.95

(OVERSEAS RATES ON REQUEST)

Please complete coupon or give us a ring for our FREE leaflet or any other information

Name: .....

Address: .....

.....

I apply for membership of the Adventurers Club – I enclose a cheque/postal order for £9.95

The Adventurers Club Ltd. run by Professionals for ALL the Adventurers!

PD385

CRL SOFTWARE PRESENT

RICHARD O'BRIEN'S

PLAY IT!

CRL House, 9 Kings Yard, Carpenters Road, London E15 2HD. Tel: 01-533 2918

CRL

Merged amendment

Use Mail Merge with Quill version 2.00 with this amendment by ***Ron McAllister***

Following the introduction of QL Version 2.00, certain amendments to the *Mail Merge* program published recently will be necessary. This is due to a change in the format of 'Document files' produced by the *Print* command of Quill 2.00, the source document used by Mail Merge.

Firstly, ensure all line numbers of the original *Mail Merge* program are exactly as printed in the original listing, then type in the amendment program carefully (using the line numbers given).

Save the program, eg, *Save mdv1-amend,* load the original *Mail Merge* program, eg, *Load mdv1-mail-merge,* and type in the line: *-Merge mdv1-amend.* The original program will now be compatible with Quill 2.00.

Save the new altered program with a different name *before* running it, eg, *Save mdv1-mail-mrg2.*

We also print, this week, the figures omitted from the original *Mail Merge* article.

Here are a few other tips using Quill 2.00. The new *install-bas* do not include a separate category for *end of page code* as did the early version. This can be overcome by putting the *ESC,12* code (FORM FEED for Epson compatible printers) in the *Postamble Code* category. If this code is not present, single page documents will not be printed to the end of the page.

The description of how to use the save facility in *install-bas* is not very clear in the documentation. Separate printer drivers can be constructed and saved to microdrive to enable easy installation in the Psion programs. I have found it useful to have three separate drivers for Quill even though I only use one Printer!

1. *RX80-PICA:* This is set up as the basic default driver for general speed work, where the appearance of the print is not that important.

2. *RX80-PICA D|S:* This is set up to include the *<Esc), "G* code in the *Preamble Code* category which results in all text being printed in the double strike mode. By using this driver, the print quality is considerably increased by speed is reduced. Both drivers 1 & 2 are set up with column width of 80 characters.

3.*RX80-ELITE:* By creating another driver the Elite character mode can be selected. This is instigated by including the *<ESC>,"M* code in the *Preamble Code* category. By using this type face the characters per line parameter can be increased up to 96 columns, very useful when a large amount of text is to be printed on standard A4 paper. The print quality is good and bears comparison with an electric typewriter.

All these drivers can be constructed and renamed within *install-bas* and then saved using function key F4. When a different printer driver is required to be installed simply run *install-bas* and you will have a permanent selection from which to choose.

Copies of the program, together with Quill instruction doc, Archive procedures, example documents and an example database are available from the author at 1 Brookside Close, Prescot, Merseyside L35 5DA, costing £6.95 inc P&P.

```
AMENDMENT PROGRAM

145  CLEAR
160  file
370  :
465  LET m=m-1
505  LET mar=mar-1
800  PRINT#(channel);FILL$(" ",mar);
 "Dear ";rec$;
1660 PRINT#(channel),rec$
1831 rec$=""
1832 REPeat line_loop
1833 IF EOF(#5) THEN EXIT line_loop
1834 temp$=INKEY$(#5,-1)
1835 rec$=rec$&temp$
1836 IF CODE(temp$)=13 THEN EXIT
line_loop
1840 END REPeat line_loop
1880 PRINT #(channel);rec$;
```

FIGURE 1. CREATING THE MAIN ARCHIVE DATABASE FILE

```
create "customer"
      title$
      name$
      firstname$
      street$
      district$
      town$
      postcode$
      productcode
      datepur$
      endcreate
```

FIGURE 2. ARCHIVE PROCEDURE FOR CONSTRUCTING SEPARATE FILE CONTAINING ALL NAMES AND ADDRESSES

```
proc mail
      input "File name ? ";filename$
      spoolon filename$
      lprint
      first
      while not eof()
      let initial=code(firstname$)
      lprint title$;" ";chr(initial);"
       ";name$;"."
      lprint street$;","
      lprint district$;","
      lprint town$;"."
      lprint postcode$
      lprint firstname$;","
      next
      endwhile
      spooloff
      endproc
```

FIGURE 3. ARCHIVE PROCEDURE FOR CONSTRUCTING FILE CONTAINING ONLY SELECTED NAMES AND ADDRESSES

```
proc choose
      input "File name ? ";filename$
      input "Select Product Code ";code
      select productcode=code
      spoolon filename$
      lprint
      all
      let initial=code(firstname$)
      lprint title$;" ";chr(initial);"
       ";name$;"."
      lprint street$;","
      lprint district$;","
      lprint town$;"."
      lprint postcode$
      lprint firstname$;","
      endall
      reset
      spooloff
      endproc
```

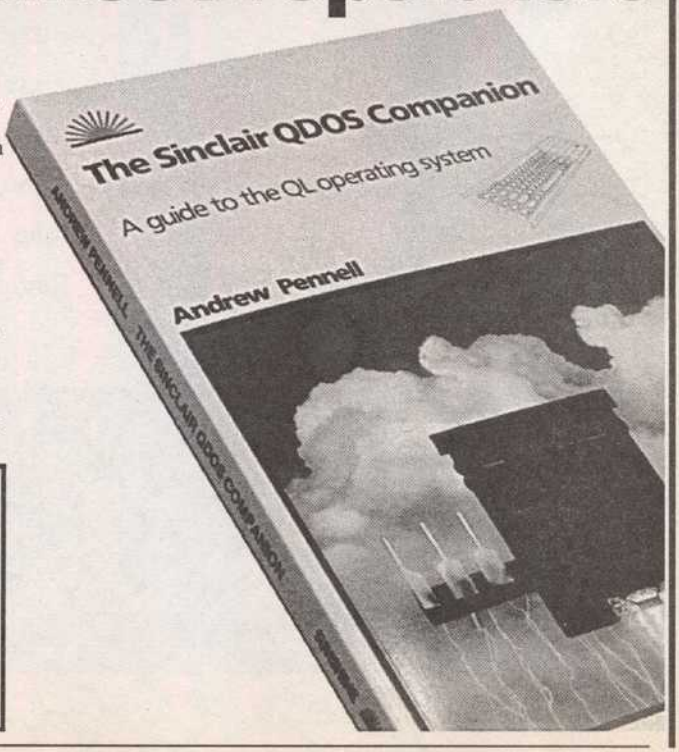

QDOS — for smooth operators

If you have a Sinclair QL and you want to program effectively in machine code, then Andrew Pennell's latest book is for you.

The Sinclair QDOS Companion is a complete guide to the working of the QL operating system. It begins with an introduction and a chapter on multi-tasking, before going on to cover the 8049 second processor, input/output, device drivers, exceptions, interrupts and the Job Scheduler, and QDOS utilities. The final chapters show you how both to extend SuperBASIC and make use of external ROMS.

The book is definitely not just a rehash of the QDOS manual, but extends the basic information to give you a broader understanding of how best to make use of QDOS. The QDOS traps are described not in numerical order but in a more logical order based on their use.

Andrew Pennell is an experienced Sinclair author. Practical Computing described his previous book Assembly Language Programming on the Sinclair QL as: 'An excellent introduction ... eminently readable'.



Please send me _____ copies of The Sinclair QDOS Companion at £6.95 plus 60p p&p each.

☐ I enclose a cheque/postal order for £_____ payable to Scot Books

☐ Please charge my Visa/Access card no._____

valid from_____ expires end:_____

Signed:_____

Name:_____

Address:_____

_____

_____

Send to: Sunshine Books, 12-13 Little Newport Street, London WC2H 7PP.

COMMODORE BBC/ELECTRON SPECTRUM

MACHINE CODE FOR BEGINNERS

A simple introduction to machine code for complete beginners which you will find both easy to understand and enjoyable and interesting to use.

The package consists of a program and specially written interactive teaching booklet, and has already helped thousands of Spectrum users to take their first steps with machine code. It can help you too. We are pleased to announce that the program and booklet have now been re-written for the Commodore 64, Commodore 16, Commodore Plus/4, BBC, and Electron computers.

We honestly believe that you will find this to be the simplest and easiest introduction to machine code available today, and we have many letters from satisfied users. We print below the review of the Spectrum version which appeared in June 1984; we have printed the entire review, nothing has been left out.

PRESS REVIEW
Another excellent package from Dream. Most programs which say they are for "absolute beginners" to machine code turn out to be anything but! You flounder around in hexadecimal and registers, and end up lost.

This is different. It's a simulation of a simple microprocessor with just four registers, and a limited instruction set. The whole of the CPU is displayed on the screen. The accompanying manual takes you *gently through* each instruction together with the processes which take place within your micro. If don't like hex, you can do it in decimal. After considering the action of the instruction, you can enter it in a simple program and watch the CPU at work. The graphics are very clever, and a real aid to understanding.

By following the manual you can build up the necessary information to understand the real thing, like a Z80, later. The manual itself is so well written, it's almost worth the package price. Even though this is a simulation, the mnemonics are very like those of the Z80. First class for the student or enthusiast.

DM

instructions 100% **display 100%**
ease of use 100% **value for money 100%** ★★★★★

Reprinted by kind permission of Home Computing Weekly

The new versions for the Commodore and Acorn machines are like the Spectrum version, but with the program and booklet modified for use with a 6502 processor instead of a Z80. A number of extra features have also been incorporated.

You can obtain your copy of "Machine Code for Beginners" from all BOOTS computer shops nationwide - if your local one doesn't have it they will be pleased to order it for you - and many other computer shops. You may also order direct from us. Simply send a cheque, postal order, or your Access number together with the form below. We have a 24 hour telephone service for Access orders and enquiries. We will be pleased to send you free details for this program on receipt of a 13p stamp.

Spectrum 16/48K	£7.95
Commodore 64	£8.95
Commodore 16, Plus/4	£8.95
BBC/Electron	£8.95

Please send Machine Code for Beginners (Tick Box)
Spectrum 16/48K ☐ Commodore 64 ☐
Commodore 16/Plus/4 ☐ BBC/Electron ☐
I enclose a cheque/PO ☐ for £
My Access number is ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐
Name (Block letters please) _____
Address (Block letters please) _____

Send to Dream Software Ltd.,
PO Box 64, Basingstoke, RG21 2LB Tel. (0256) 25107

COMMODORE 64 COMMODORE 64

MEGA-DISK

Transfer your fast loading tapes to disk – and fast load them as well! MEGA-DISK comprises:

1. A suite of 26 routines which will transfer a wide variety of multipart/ flashingscreen/picture loaders including some VERY popular chart toppers. No user knowledge required.
2. A disk fast loading system equal in performance to any software competitor. Just add this short program to each disk and most programs will load at FOUR times the normal rate – without having to load the utility separately.
3. A multi-option FAST disk formatter, and a disk to disk transfer utility for single files of any length. Disk £11.00.

DISKUS I

The most efficient tape to disk transfer utility yet devised. For virtually all standard rate programs. Multipart, autorun and even headerless files are all catered for. All transfer is automatic. No user knowledge required. Diskus 1 has special provision for program types which NO other utility can handle. Cassette £9.50. Disk £11.00.

R.B.S.

Convert you slow loading cassette games to TURBO LOAD. Multipart and auto run programs are handled with ease. Programs reload independently. No user knowledge required. This is demonstrably the BEST. Cassette £7.50.

HYPERSAVE 64. Programmers fast loader. £7.50 (tape)
PRO-SPRITE. Sprite library/editor/animator. £7.50 (tape)

DISCOUNTS: DISKUS 1 + MEGADISK (disk) £19.00. Any two tapes programs on one tape at £9.99. ENTIRE PACK (every program in this ad) just £25.00 (disk only).

All programs for Commodore 64. Cheque/P.O. or S.A.E. to:

DOSOFT (DEPT P)
2 OAKMOOR AVE.
BLACKPOOL FY2 OEE

PD224

IT'S

SPECTRUM	RRP	2U
MAY CRASH SMASHES		
BRUCE LEE	7.95	5.90
DRAGONTORC OF AVALON	7.95	5.95
EMERALD ISLE	6.95	5.40
SPY HUNTER	7.95	5.95
STARION	6.90	5.25
WORLD SERIES BASEBALL	6.95	5.25
APRIL CRASH SMASHES		
ALIEN	8.99	6.95
ALIEN 8	9.95	6.95
DEATH STAR INTERCEPTOR	7.95	5.25
RAID OVER MOSCOW	7.95	5.90
WRIGGLER	5.95	4.75
REST OF THE BEST		
ANIMATED STRIP POKER	6.95	5.50
911 TS	7.95	6.50
FORMULA ONE	7.95	5.90
BRIAN JACK'S SUPERSTAR	7.95	5.99
CHUCKIE EGG 2	6.90	5.50
EVERYONE'S A WALLY	9.95	6.99
GRAND NATIONAL	6.95	5.50
GREMLINS	9.95	7.20
GYRON	9.95	7.50
KOMPLEX	9.95	7.50
LIGHT MAGIC	14.95	11.95
LEVEL 9 ALL	9.95	7.20
CHAOS	7.95	5.95
MINI OFFICE	5.95	4.75
MOON CRESTA	6.95	5.50
PSYCHEDELIA	6.00	4.50
ROCKY HORROR SHOW	8.95	7.50
SHADOWFIRE	9.95	6.99
SUPER GRAN	9.95	7.50
SOFTWARE STAR	6.95	4.50
SPY VS SPY	9.95	7.50
TALISMAN	7.95	5.95
WITCH'S CAULDRON	6.95	5.50

SINCLAIR QL	RRP	2U
ASSEMBLER C ONE	29.95	24.95
BACKGAMMON	15.95	11.95
BCPL METACOMCO	59.95	49.95
BRIDGE PLAYER	19.95	15.95
CASH TRADER	69.95	59.95
CHESS 3D	19.95	15.95
FORTH COMPUTER ONE	39.95	34.95
LISP METACOMCO	59.95	49.95
MONITOR COMPUTER ONE	24.95	19.95
SUPER MONITOR	18.95	14.95
SUPER SPRITE GENERATOR	19.95	15.95
HACKER'S HANDBOOK	4.95	4.95
PASCAL COMPUTER ONE	39.95	34.95
AREA RADAR CONTROLLER	10.95	8.95
WEST	19.95	15.95
ZKUL	19.95	15.95

AMSTRAD	RRP	2U
ANDROID ONE	7.95	5.95
ANIMATED STRIP POKER	8.95	6.95
BATTLE FOR MIDWAY	9.95	6.99
D T DECATHLON - IN STOCK	8.95	6.50
CONFUZION	6.95	5.50
DARK STAR	7.95	5.95
DEFEND OR DIE	7.95	5.95
EMERALD ISLE	6.95	5.75
ER'BERT	5.95	4.75
FIGHTER PILOT	8.95	5.95
FLIGHT PATH 737	6.95	5.75
GHOSTBUSTERS – IN STOCK	10.99	8.95
HOBBIT	14.95	10.95
INTERCEPTOR ALL	6.00	4.50
JET SET WILLY	8.95	5.95
LEVEL 9 ALL	9.95	6.95
RING OF DARKNESS	9.95	7.50
MASTERFILE 464	25.00	19.99
MINI OFFICE	5.95	4.75
MOON BUGGY	7.95	6.50
PINBALL WIZARD	8.95	6.50
PYJAMARAMA	6.95	5.50
QUILL	16.95	13.50
HUNCHBACK II – IN STOCK	8.95	6.50
KONG STRIKES BACK	8.95	6.50
SORCERY	8.95	5.95
MILLIONAIRE	6.95	5.50
TANKBUSTERS	7.95	5.95
TECHNICIAN TED	7.95	5.95
WORLD CUP FOOTBALL	7.95	5.95

COMMODORE 64	RRP	2U
CYPHOID 9	9.95	6.99
AIRWOLF	7.95	6.50
SUPER PIPELINE II	9.95	7.50
CAULDRON	7.99	6.50
LORDS OF MIDNIGHT	9.95	5.99
PASTFINDER	9.99	7.50
SHADOWFIRE	9.99	6.99
SUPER HUEY	11.95	8.95
TIR NA NOG	9.95	7.50
MASTER OF THE LAMPS	9.95	7.50
ARCHON	9.95	7.50
SPITFIRE 40	9.95	7.50
WORLD SERIES BASEBALL	7.95	5.75
MINI OFFICE	5.95	4.75
MOON CRESTA	6.95	5.50
ONE ON ONE	9.95	7.50
PITSTOP II	8.95	7.25
RAID ON B BAY	9.95	7.50
IMPOSSIBLE MISSION	8.95	6.75
STAFF OF KARNATH	9.95	7.25
GREMLINS	9.95	5.50
BLAGGER GOES TO		
HOLLYWOOD	9.95	7.50
ROCKET BALL	7.95	6.50

CHEQUE/PO PAYABLE TO:
IT'S
SEND TO: **IT'S, 33 FOSCOTE ROAD, LONDON NW4 3SE.**
ENQUIRIES: 01-430 2284
ALMOST EVERYTHING AVAILABLE IN STOCK

PD364

Colour coded

The final parts of Tracer – the printer routine – for the BBC B
by ***Calvin Woodings***

This week we provide the source code of a printer routine for use with *Tracer*, and give some general hints as to how you might get the best out of the program. First the listing.

Tracer indexes contain colour codes as field delimiters and these codes send some printers crazy. The routine removes these codes and replaces them with spaces, but this is not all. Continuing in the spirit of thorough error trapping, the routine actually checks to see whether or not the printer is on and ready to receive data, and if it isn't it tells you, and leaves you in control.

The comments with the listing explain how it works. When you have finished typing it, save it *before* running it, in case you have inadvertently perpetrated a fatal typo.

Running it will assemble the code at *&A10*, so the next thing you do is to save the machine code onto your *Tracer* disc with **SAVE M.PRINT A10 ABC*. You now have to modify the *!BOOT* program to load the machine code automatically, using the new *!BOOT* shown. **BUILD* it in the usual way as instructed in the DFS manual. Finally, modify line 90 as indicated. Now you should have a fully equipped *Tracer* disc.

If you have missed any parts, or don't want to type it all in yourself, a 40 track disc with the complete set of *Tracer* programs is available for £12 (inclusive) from the author at 12 Copsewood Ave, Nuneaton, Warwicks, CV11 4TQ.

Searching – Whilst the program itself guides you through the search procedure, there are a couple of points to note. a) You are not able to edit screens whilst in *Search* mode. If you spot an entry you want to alter, note its reference number and get back to it using the *Display/Edit* option. b) You can only print out from the *Search* mode, so if for any reason you want to list the whole index, print it out by searching for a space.

Editing – If you operate the normal cursor control keys you will find that the cursor can be moved around the display area in the directions indicated by the arrows. Now, if you press any of the normal keys you will see that the character you typed replaces the one under the cursor on the screen. In the *Edit* mode some of the keys have special actions: <ESCAPE> and <COPY> do nothing. <RETURN> returns you to display mode, so make sure you finish all the editing you wish to do on a page before pressing it. (You do not have to press <RETURN> after correcting each entry.) <DELETE> deletes the character to the left of the cursor. <CTRL D> (ie, Control and D characters pressed simultaneously) causes the line on which the cursor rests to be deleted, and the space it occupied to be closed up. Never try to delete blank lines at the end of the index.

<C:TRL I> – This combination of keys causes a space to be inserted above the line containing the cursor. <TAB> has the same effect if you prefer it. It/they otherwise behaves like the <CTRL D> option. In order to fill the space created by this command you can simply type new text into it. Do not try to insert in blank spaces at the end of a screen.

These line-insert and line-delete keys will auto-repeat, so be careful not to hold them down for too long.

When using the <DELETE> key or entering new text, you will notice that there appear to be two barriers to progress in the shape of invisible columns down the screen in front of the field changes. You are not allowed to delete or overwrite these columns because they contain the Teletext codes which colour the fields. In order to move over them simply use the cursor keys to move the cursor to the right (if entering text) or to the left (if deleting).

If you insert a line on the last page of an index, the bottom line of the index vanishes whilst entering the new text. Don't worry, it reappears the next time you select the *Display* mode.

One final precaution when editing. Do not add records to the end of an index simply by typing them in whilst in edit mode. This may appear to work on the screen, but it will not add what you type to the index. Always return to the *Add Records* mode to add records to the end of an index.

If as a result of experimenting you have made some drastic alterations to your index don't worry. Just remember not to use the *Save Index* option, and your disc copy will remain unchanged.

Saving – Indexes are saved under the name you chose at the start, but prefixed with the *"I."* directory letter. If you want to change a name you should *Quit* and do so using the normal DFS **Rename* command, having first unlocked it with **Access I.<index>*. Remember that all indexes must be in the *"I."* directory, and should be relocked *(*Access I.<index> L)* after renaming.

Error Messages

File Not Found – The index you asked for was not on the disc in the drive. If a list of indexes is shown after this error message, you can press <RETURN> and have another go. If the message flashes you are trying to

```
 10 REM PRINTER ROUTINE FOR TRACER
 20 REM BY C.R.WOODINGS (C) 1985
 30
 40 REM ENABLES PRINTER TO AVOID PRINTING TELETEXT CHARACTERS
 50
 60 REM*******************************************************
 70
 80 WRCHVEC=&20E
 90 OSWRCH=&FFEE
100 print=&A10
110 FOR Z%=0 TO 3 STEP 3
120 P%=&A10
130 [OPTZ%
140 PHP:PHA:TXA:PHA:TYA:PHA \ SAVE REGISTERS
150 \
160 \CHECKS TO SEE IF PRINTER IS ON
170 \
180 LDA#2:JSR OSWRCH          \ PRINTER ON CODE
190 LDA#1:JSR OSWRCH          \ NEXT CHARACTER TO PRINTER
200 LDA#32:JSR OSWRCH         \ SPACE TO PRINTER
210 LDA#1:JSR OSWRCH
220 LDA#13:JSR OSWRCH         \ CARRIAGE RETURN TO PRINTER
230 LDA#3:JSR OSWRCH          \ PRINTER OFF
240 LDA#&80:LDY#&FF:LDX#&FC \ SET UP OSBYTE PRINT BUFFER CALL
250 JSR&FFF4:TXA
260 CMP#63:BNEend             \ IF A=63 PRINTER IS ON
```

use a completely empty disc. Press <ESCAPE> to regain control, and put in a *Tracer* disc, see below.

Index Full – All the available memory space has been used up. You can edit the index providing you do not try to insert any new lines without first deleting an old one.

Disc Full – There is insufficient free space on the original disc for the index you are trying to save. Use any disc with space to save the index temporarily, and prepare your next *Tracer* disc as follows:

a) Quit TRACER and remove disc.

b) Format a new disc.

c) If you only have one drive, put a write-protect tab on the original *Tracer* disc and copy the files in the *"$"* directory from the original *Tracer* disc onto the new disc using **COPY00$.**. Please consult the Disc Filing System manual if in doubt about the procedure for copying. (If you have two drives, put the original *Tracer* disc in drive 0 and the new disc in drive 1. Use **COPY01$.** here, and in section d below.)

d) **COPY* the index you saved temporarily, onto the new *Tracer* disc. (**ACCESS I.<index>* followed by **COPY00I.<index>*. If you wish, rather than start a new disc, you can create more space on the original disc either by trying the **Compact* command, or by deleting indexes which you are no longer interested in and then compacting.

Name in Use – You have tried to create a new index with the same name as one already on the disc. Use a new name or a new *Tracer* disc.

```
270 LDA#12:JSR OSWRCH        \ CLEAR SCREEN FOR OUTPUT
280 LDA#2:JSR OSWRCH         \ PRINTER ON
290 \
300 \REDIRECTS OSWRCH TO START
310 \
320 .reset LDA WRCHVEC:STAnewvec
330 LDA WRCHVEC+1:STAnewvec+1
340 LDA#START MOD256:STA WRCHVEC
350 LDA#START DIV256:STA WRCHVEC+1
360 JMP tidy
370 \
380 \ERROR 45 BECOMES "PRINTER OFF"
390 \
400 .end BRK
410 EQUB 45
420 EQUS "Printer Off"
430 BRK
440 .tidy
450 PLA:TAY:PLA:TAX:PLA:PLP:RTS \ RESTORE REGISTERS AND FINISH
460 \
470 \MAIN PRINTER DRIVER FOLLOWS
480 \
490 .START PHP
500 CMP#10:BEQ pr             \ NEWLINE OK TO PRINT
510 CMP#&0D:BEQ pr            \ RETURN OK
520 CMP#3:BCC pr              \ ASCII<3 OK
530 CMP#126:BCS spc           \ ASCII>126 NOT OK, PRINT SPACE INSTEAD
540 CMP#32:BCC spc            \ ASCII<32 GETTING HIS FAR ARE NOT OK
550 .pr PLP
560 JMP(newvec)               \ PRINT CONTENTS OF ACCUMULATOR
570 .spc LDA#32
580 JMP pr                    \ PRINT SPACE
590 .finish                   \ FINISH PRINTING ROUTINE
600 PHP:PHA:TXA:PHA:TYA:PHA \ SAVE REGISTERS
610 \
620 \REDIRECTS OSWRCH BACK TO WRCHVEC
630 \
640 LDAnewvec:STA WRCHVEC
650 LDAnewvec+1:STA WRCHVEC+1
660 LDA#3:JSR OSWRCH          \ PRINTER OFF
670 LDA#12:JSR OSWRCH         \ CLEAR SCREEN
680 PLA:TAY:PLA:TAX:PLA:PLP:RTS
690 .newvec EQUW &E0A4        \ IN CASE FINISH IS CALLED FIRST!
700 ]:NEXT
```

```
>
  1 *LO.M.PRINT
  2 ?&CA0=&D
  3 *KEY0CLS:PAGE=&1100|MLO.
  "TRACER"|M:RUN|M
  4 *FX138,0,128
```

```
10 REM New line 90 for Tracer to
accomaodate Escapes from machine
code
11 REM print routine
12
90 K%=0:IF ERR<>17 CLS:REPORT ELSE
CALL&A98:GOTO80
```

Four unputdownable books to make your Commodore unswitchoffable

Discover all the Commodore Books that will really help you get the most from your C16, Plus 4 'or good old 64...' follow the flow to find out the best buys for you and your Commodore...

First, what's your computer?

This way for Commodore 64 owners . . . and to three great books

This way for the new C16 and Plus4 . . . and your beginners' guide

Brian Lloyd has written the definitive book for everyone starting to use the superb new Commodore C16 and Plus4 micros. You'll soon be able to get programming in BASIC, and at the end of a great read, you'll be well on your way to producing hi-res graphics and doing some very neat disk file handling, for instance, all without getting defeated by needless technicalities. The Commodore C16/Plus4 Companion is a must for every owner and user, and it's only £5.95.

Now, what's your interest?

Like to learn Logo, the language that's beyond mere BASIC?

SUNSHINE

If you want to make music, look no further . . .

Here's how to program and play your 64 like a fine instrument

And here your 64's a synthesized sound centre

Inside every Commodore C64 sits SID, the unique and very powerful sound Interface Device. Understand and make good use of SID and you've got a wonderfully musical micro. Ian Waugh's book lets you use SID to the fullest, with programs to produce chorus, echo, polyphony, even sound effects. Start playing around with your 64, and let it make music for you. The book's only £6.95, too.

Concentrating on the Commodore C64 as a controller or peripheral to other music-making goodies, Mark Jenkins — technical editor of Melody Maker — has produced a superb new book that lets you into all the secrets of the 64's very powerful sound generation system. At only £6.95, its novel approach is a must for both musicians and micro enthusiasts.

There's no doubt that everyone's talking about Logo — and here's your chance as a Commodore 64 owner to discover what all the fuss is about. Logo helps you liberate the real potential of your 64, creating great sounds, super graphics and the most effective sprites you've ever seen. Once you've used Logo, there's no going back to Basic! Boris Allen's book will cost you just £6.95

All these latest Sunshine Books are available from your local bookshop, from W H Smiths and John Menzies, and also direct by post from Sunshine.

See your bookseller and reserve your copy today, or complete and send this special direct order coupon.

To: Sunshine Books,
12-13 Little Newport Street, London WC2H 7PP

Please send me the following book(s) for the Commodore:

_____ copies of the Commodore C16/Plus4 Companion at £5.95 + 60p p&p each

_____ copies of Building with Logo on the Commodore 64 at £6.95 + 60p p&p each

_____ copies of Commodore C64 Music at £6.95 + 60p p&p each

_____ copies of Electronic Music on the Commodore 64 at £6.95 + 60p p&p each

☐ I enclose a cheque/postal order payable to Sunshine Books for £_____

☐ Please charge my Access/Visa card

No._____ Valid from _____

expires end _____

Signed:_____

Name:_____

Address:_____

_____

_____ Dealer enquiries: 01-437 4343.

Words per minute

Keep those fingers nimble with Typing Tutor for the 64 written by ***William Rowlands***

Micro Typer will help type in your listings faster and also teach you to touch-type.

After typing in and running the program you are given an exercise to do. When you have completed the exercise, the 64 will give you the percentage correct and your speed of characters per second.

Variables

c$ – Line of spaces used to clear lines of text.
ch – Number of characters in tests so far
right – Number of correct characters
sum – Number of characters entered.
ti – System variable counting time elapsed in 60ths of a second.
tt$ – Temporary storage for time taken.

When using the Micro Typer the exercise can be selected by pressing F1-previous, F3-present, F5-next.

The adventurous can add data for their own tests from Line 1840 onwards if they wish.

```
1000 rem------ "Micro  TyPer" ---------
1010 :
1020 rem"by- William Rowlands- Arbroath
1030 :
1040 rem*******************************
1050 rem ---- Prints keyboard ---------
1060 Poke 53281,12:Poke 53280,6
1070 Print chr$(14)
1080 Print "■■  ■ Commodore 64 --------- Micro TyPer ■"
1090 Print "■■■ Left  4:3:2: 1 ■→■ 1 :2:3:4 Right Fingers■";
1100 Print "   ■■■
```

```
1600 print " ";a$:print " ";:for i=1 to len(a$)
1610 get t$:if t$="" then 1610
1620 if t$=" " or t$=" " or t$=" " or t$=" " or t$=chr$(13) then goto 1620
1630 if i=1 then ti$=tt$
1640 sum=sum+1:if t$=mid$(a$,i,1) then print t$;" ";:poke 1744+i,32
1650 if t$<>mid$(a$,i,1) then poke 1744+i,158:print" ";:goto 1610
1660 right=right+1:next i:print " ":ch=ch+len(a$):tt$=ti$
1670 per$ =str$(int(right/sum*1000)/10)
1680 print " ";"      ";per$ "%   Correct"
1690 print " " str$(int(sum/(ti/6000))/100);"  characters per second"
1700 print "   Which exercise would you like next"
1710 print "   F1-Previous  F3-Present  F5-Next   ";
1720 get a$:if a$<>" "and a$<>" "and a$<>" " then 1720
1730 if a$=" " and ex>1 then ex=ex-1
1740 if a$=" " and ex<ma then ex=ex+1
1750 print "                                                    "
1760 print "                                                  "
1770 print "                                                  "
1780 print "                                                  ";
1790 if q$<> "n" then 1550
1800 poke 780,0:poke 781,21:poke 782,0:sys 65520:print c$
1810 if q$<>"n" then 1550
1820 end
1830 rem ------ data for tests ---------
1840 data "asdf :lkj asdf :lkj asdf ;lkj as asdf;"
1850 data "ask dads; lads all gas; dad has a Jag;"
1860 data "flags; salads; :a lad had half a glass"
1870 data "there is a good supply of water here;:"
1880 data "the goods are sure to get the top rate"
1890 data "at their request that word was deleted"
1900 data "a boy on a bicycle just missed the van"
1910 data "the fan was banned, extra cabs needed."
1920 data "read the print for load, save and run;"
1930 data "return to next step then read:not list"
1940 data "get data end: restore, open and close:"
1950 data stop
```

Here's a new book that will make sure your business gets all the benefit of the Macintosh, and your personal computing is as effective as it can be. Mastering your Macintosh Software is a British book that takes you through every detail of the Macintosh system, Macwrite and MacPaint – from the Finder to Find and Replace, from Lassoes to Scrapbooks, from San Francisco to FatBits.

Maccessory.

Alison McCallum-Varey – recognised for her careful, sympathetic style – will help you to rapidly master all the powerful facilities of the Mac, whether you want the flexibility of word processing in MacWrite, or to develop the full potential of MacPaint for complex graphics.

Example applications are included at every step to illustrate principles involved and to give ideas for developing your own applications. Master your Macintosh quickly. At only £8.95, it's well worth it.

Macintosh, MacWrite and MacPaint are trade marks of Apple Computer

Please send me Master Your Macintosh Software at £8.95 + 60p p&p

☐ I enclose a cheque/postal order for £_____ Payable to Sunshine Books.

☐ Please charge my Access/Visa card No._____

Valid from_____ expires end_____

Signed_____

Name_____

Address_____

Send to Sunshine Books, 12/13 Little Newport Street, London WC2H 7PP.

Look out for the Sunshine range at WH Smiths, John Menzies, other leading retail chains and at all good bookshops. Dealer Enquiries: 01-437 4343.

PROGRAMMERS

Digital Integration Limited is an expanding software house specialising in high quality original video games.

We require proficient machine code programmers for the design and development of home computer software. Applicants must have an extensive knowledge of Z80 or 6502 assembly language programming, creative talent, self motivation and a strong interest in home computers. CP/M experience would be an advantage.

Highly competitive salaries offered according to experience, plus a profit sharing bonus scheme. Excellent working conditions.

Please send c.v. to:
Digital Integration Limited
Watchmoor Trade Centre, Watchmoor Road,
CAMBERLEY, Surrey, GU15 3AJ
Telephone: 0276 684959

DIGITAL INTEGRATION

MOVEMEAD DISCOUNT SOFTWARE COMPANY

Spectrum	RRP	Our Price
Raid over Moscow	7.95	6.95
Bruce Lee	7.95	6.95
Project Future	6.95	5.45
Everyone's a Wally	9.95	7.45
Daley Thompson	6.90	4.90
Knights Lore	9.95	7.20
Underworlde	9.95	7.20
Lords of Midnight	9.95	7.95
Doomsdark Revenge	9.95	5.95
Psytron	7.95	5.90
Valhalla	14.95	3.99
Blockbusters	7.95	6.75
Jet Set Willy	5.95	4.46
Tir Na Nog	9.95	6.90
Airwolf	6.90	5.45
Monty is Innocent	6.95	4.99
Great Space Race	14.95	3.99
Match Point	7.95	4.99
Gift of the Gods	9.95	7.95
Tripods	11.50	6.99
Alien 8	9.95	7.95
Ghostbusters	9.95	7.45
Software Star	6.95	5.95
Technician Ted	5.95	4.75

Commodore 64	RRP	Our Price
Ghostbusters	10.95	8.30
Beachhead	9.95	7.95
Bruce Lee	9.95	8.45
Summer Games	14.95	10.30
Raid over Moscow	9.95	7.95
Staff of Karnath	9.95	6.99
Tapper	9.95	7.50
Bristles	9.95	3.99
Spy vs Spy	9.95	7.95
Boulder Dash	8.95	6.45
Hobbit	14.95	7.99
Daley Thompson Decath	7.90	5.25
Fighter Pilot	9.95	7.50
Breakfever	7.00	5.49
Flip & Flop	9.95	3.99
Spy Hunter	9.95	7.50
Impossible Mission	8.95	7.45
Astro Chase	9.95	3.99
Congo-Bongo	9.95	7.95
Kong Strikes Back	7.90	5.45
Up and Down	9.95	7.95
Havoc	9.95	4.99
Chinese Juggler	6.90	2.99
Indiana Jones	9.95	7.95
Raid Over Moscow	9.95	7.95

All prices include VAT, Postage and packing is **FREE** on orders in excess of £15.00. All orders of less than this amount are charged 0.75p towards the cost. 1,000's of more titles available for all machines. Send a S.A.E. for full list. Send your cheque/P.O. for the full amount (plus postage, if required), to:—

MOVEMEAD (MARKETING) LIMITED
55 ALESBURY STREET
BLETCHLEY, BUCKS., MK2 2BH Dept PCW
Telephone: (0908) 79232/3

Order despatched within 3 days of receipt of your order and cheque/PO. All tapes are offered subject to availability. E&OE.

PD377

GOODBYTE

SPECTRUM

GAME	RRP	OUR PRICE
DALEY THOMPSON	6.90	4.99
BEACHHEAD	7.95	5.95
KNIGHTS LORE	9.95	6.50
UNDERWORLDE	9.95	6.50
LORDS OF MIDNIGHT	9.95	5.95
DOOMDARKS REVENGE	9.95	5.95
COMBAT LYNX	8.95	5.25
DARK STAR	7.95	4.75
STAR STRIKE	5.95	4.50
TIR NA NOG	9.95	6.95
AIRWOLF	6.90	4.99
MATCH DAY	7.95	5.25
TECHNICIAN TED	5.95	4.50
GREAT SPACE RACE	14.95	4.99
EVERYONE'S A WALLY	9.95	6.99
RAM TURBO INTERFACE		18.00
BRIAN BLOODAXE	7.95	5.25
ALIEN 8	9.95	6.95
PROJECT FUTURE	6.95	4.99
TAPPER (Av 1 May)	7.95	5.95
SPYHUNTER	7.95	5.95
DEATH STAR INTERCEPTOR	7.95	5.25
MEGA HITS	19.95	12.95
DRAGON TORC OF AVALON	7.95	5.95
GRAND NATIONAL	6.95	5.50
WIZARDS LAIR	6.95	5.50
MOONCRESTA	6.95	5.50
WORLD SERIES BASEBALL	6.95	5.25
SHADOW FIRE	9.95	6.99
MINI OFFICE	5.95	4.75
SPY Vs SPY	9.95	6.99
9ITS	6.95	5.50
STARION	7.95	5.75
GYRON	9.95	7.50
CHUCKIE EGG II	6.95	4.75
BOOTY	2.50	1.99
ROCKY HORROR SHOW	8.95	5.75
ROMPOR ROOM	9.95	6.99
BRIAN JACKS	7.95	5.95
TWIN KINGDOM VALLEY	7.95	3.99

AMSTRAD

JET SET WILLY	7.95	5.95
SORCERY	7.95	5.95
DARK STAR	7.95	5.95
DALEY THOMPSON DECATHLON	8.95	6.50
KONG II	8.95	6.50
QUASIMODO REVENGE	8.95	6.50
ALL INTERCEPTOR	6.00	4.50
GHOSTBUSTERS	10.99	8.99

GAME	RRP	OUR PRICE
3D STAR STRIKE	6.95	5.25
COMBAT LYNX	8.95	5.75
TANK BUSTERS	7.95	5.95
THE HOBBIT	14.95	10.95
FIGHTER PILOT	7.95	5.95
MINI OFFICE	5.95	4.75
BATTLE FOR MIDWAY	9.95	6.99

BBC/ELECTRON

TALES OF THE ARABIAN NIGHTS	7.00	5.20
COMBAT LYNX	8.95	6.25
SABRE WULF	9.95	7.50
MINI OFFICE	5.95	4.75
BRIAN JACKS	79.95	5.95

COMMODORE 64

GHOSTBUSTERs	10.95	8.25
TALES OF ARABIAN NIGHTS	7.00	3.75
BEACHEAD	9.95	7.50
DEATH STAR INTERCEPTOR	9.95	6.99
MY CHESS II	11.95	8.25
ZAXXON	9.95	7.50
PSI WARRIOR	9.95	4.49
RAID OVER MOSCOW	9.95	7.50
STAFF OF KARNATH	9.95	7.25
SPY VS SPY	9.95	5.99
DALEY THOMPSONS DECATH.	7.90	5.25
KONG'S REVENGE	7.90	5.75
BREAKFEVER	7.00	4.95
COMBAT LYNX	8.95	6.50
IMPOSSIBLE MISSION	8.95	6.75
LORDS OF MIDNIGHT	9.95	5.99
MEGA HITS	19.95	12.99
AIRWOLF	7.95	5.95
TIR NA NOG	9.95	7.50
WORLD SERIES BASEBALL	7.95	5.75
HOBBIT DISK	17.95	14.00
MINI OFFICE	5.95	4.75
SYPHOID 9	9.95	6.99
SHADOWFIRE	9.95	6.99
MOON CRESTA	6.95	5.50
ROMPER ROOM	9.95	6.95
HOBBIT DISC	17.95	14.95

ALL PRICES INCLDUE P&P

PLEASE NOTE IF OUR ORDER EXCEEDS £50 YOU GET 10% FURTHER DISCOUNT

SEND CHEQUES/P.O. TO

GOODBYTE PCW10
94 LEATHER LANE, LONDON EC1
(TEL: 01-404 4245)

PD359

* DENOTES SPECIAL OFFER WHILE STOCKS LAST

★ BUDGET DISCS ★

FOR PROFESSIONAL USERS
TOP QUALITY UNLABELLED BRANDS

5¼" BLANK DISCS (PER BOX OF 10)

SS/SD	£14.00
SS/DD	£15.00
DS/DD	£18.00

3" COMPACT DISCS

1 off	£3.99
5 off	£17.50
10 off	£33.50

3½" COMPACT DISCS

1 off	£4.99
5 off	£22.45
10 off	£43.50

BLANK CASSETTES (PER BOX OF 10)

C10	£3.50
C15	£3.60
C20	£3.75

All prices inclusive of VAT and P&P
Further discounts available on bulk orders

Send cheques/PO's to:

BUDGET DISCS
76 TEMPLE ROAD
BOLTON, LANCS BL1 3LT
(0204) 40010

PD357

Amstrad tips

At times it can be almost poetic the way a question and answer will appear in the same bag. Take, for example, the appeals from Samantha Butcher of Denham, W McMillan of Knottingley, Sgt Tony Ashwood at an RAF posting in Gutersloh for some pokes for Amstrad games, and in particular *Manic Miner*. The answer comes from star hacker Murray Pope of West Linton – *Manic Miner* 464 Poke 28557, n-1 where n is required lives or Poke 28585, 0 to give infinite lives. These should be entered as line 100 before the Call statement in the Basic Header.

Murray also has sent in these pokes for the 464 version of *Blagger* – Poke 32518,n where n is less than 240 to give n lives. Poke 31938,0 Poke 31940,0 together make the conveyors act like dry land or Poke 32579,0; Poke 32580,0 together give infinite lives. Murray points out that to get the pokes in you will need to remove the protection of the Basic – most tape back-up utilities do this as a matter of course.

Sticking with *Manic Miner* for a second, Lee Mogford of Pilsey wants the poke for the Spectrum version of this, and for *Jack and the Beanstalk*. Even though the former is an old poke here it is again courtesy of Jeremy Mitchell of High Wycombe – Poke 35136,0.

Now then let's stick with some Amstrad tips to keep the customers satisfied and here is a marvellous poke from Geoff Goff of Hornchurch for Alligata's excellent and zappy *Defend or Die* – replace header with this routine:

```
10 Memory &3FFF: Load " "
20 Poke &64E4,99: Rem lives
30 Poke &64E9, &99: Rem smart bombs
40 For x=&7F83 to &7F8B: Print CHRS (peek(x));: next: for x=1 to 5000: next
50 Call &4025
```

Line 40 prints a short and unsavoury message from the authors and can be omitted.

Steven Miller of Haleworth reveals that if you type CTRL, shift and G together on *Roland in the Caves* you can exit a level at any time. Unfortunately, after doing this four or five times a bug halts the program in line 750. Steven also says that Poke 27434,n where n is number of lives below 85 works on 'software Supersavers', but I don't know what game he's talking about, If you do, use the poke.

Andrew Thompson of Bebington has finished Amsoft's version of *Pyjamarama* with 4581 paces and 95% and wants to know whether *Life of Wally* (now called *Everyone's a Wally*) will appear on the 464, or will any of the ultimate games? Well, Andrew, the former should be appearing on the machine very soon. As for Ultimate I don't know how many of their existing titles we can look forward to, but they have pretty much promised that some exciting new releases may be underway for the Amstrad.

Finally on the subject, Oliver Dennis of London has finished *Pyjamarama* with 89% and 5514 paces and wants to warn everyone not to buy *Centre Court* by Amsoft. Oliver also has a couple of tips for *Technician Ted* – make a map and use the lift! This brings up the point that I've had loads of people writing in who haven't a clue in which order to tackle the tasks. Some of you haven't realised that the first task is of course 'Ted's Desk' even though there is a pretty hefty clue given on the cassette inlay. I will also reveal that task two is the 'Silicon Slice Store' – a room that is impossible to attempt until task one is completed.

Even though it is one of our competition games, it is so fiendish that I'm confident that even if I revealed the order of all the tasks it would still be months before anyone finished it (my pet hate of the moment is that blasted cloakroom, which Hewson have made sure you have to pass through at every opportunity, – equalled only by the evil parrot in Level 9's *Return To Eden*).

The other thing about TT is that because the order of the tasks is pre-defined we could still get a comparison between scores as long as you send in your times as well as the number of tasks completed. However, I won't be able to give away any more until I get the nod from Hewson. Watch this space.

The other week we printed a bit about Ultimate's Commodore game *Staff of Karnath*. Julian Lisk of Islington has echoed the plea for the answer to the library problem, and some help with how to use the secret compartments. In return he has revealed how to get past the green monster in the south Tower Room (at last! – that explains why the monster doesn't appear in my list of 'hates' as well). "Go to the Upper Guard Room and use the spell Throbin on the shield – the cross will change colour. Then use Umphalus on the shield and the cross will drop to the floor. If you pick it up the green monster won't come near you." Many thanks for that, Julian.

Here's a wacky thing! Steven Jones of Yately in Surrey has found that if you play Firebird's *Booty* with a Currah microspeech attached you are faced with an entirely different game. As he describes it "a man swims underwater and the idea is to catch 20 small fish. Boats pass overhead, and it looks a bit like Durrel's *Scuba Dive*". I must confess I've had this letter knocking around for a while, but to be honest I simply did not believe it and since our Microspeech has long given up the ghost it took a long while to check out.

Finally following on from the column of a couple of weeks ago, here is the poke for infinite lives on *Finders Keepers* thanks to Peter Millar of Cranfield – Poke 30394,255. Peter wants to echo the apparently unanimous praise that Mastertronic are receiving for this game and points out that "even with infinite lives I've only managed to cover 88% of the rooms". Pete also offers this poke for *Pyramania* on vol 12 of the tape mag 16/48 – Poke 30357,0.

Incidentally, I've also had some reams of tips for that other excellent cheapie *GoGo the Ghost*, but I've run out of room for this week so keep your eyes peeled. I will also be dealing with the Ultimate fast loaders, which as Peter Millar points out are "preventing 50% of the enjoyment of the games for inexperienced but enthusiastic hackers".

Tony Kendle

We are searching for the top UK computer games player – the best there is!

The very best of Britain's game players will get to fight it out on a number of top secret new games – scheduled for release in the autumn.

Here's how it works

Study the table below and look at the column for the machine you have – these are the games you'll need to master. Send your high scores in on the form below, making sure that your scores are authenticated by a responsible individual signing the form. Any score achieved using technical short-cuts – such as infinite lives Pokes – will not be accepted.

Between now and September Tony Kendle will be keeping you up to date on the *Arcade Avenue* page with just who has the scores to beat. Then, in September, the top three scorers on each machine will battle it out for a place in the final and the chance to be the first to play our 'top secret' games.

	Commodore	BBC	Spectrum	Amstrad
Game 1	Suicide Express	Elite	Technician Ted	Sorcery
Game 2	Beach Head	Jet Pac	3D Star Strike	Splat!
Game 3	Shoot the Rapids	Chuckie Egg	Cyclone	Manic Miner

Game Wizard Entry Form

Micro .....

Game 1 score: .....

Game 2 score: .....

Game 3 score: .....

Name .....

Address .....

.....

.....

Your signature .....

Witness's signature .....

.....

Quite simply, be a better Spectrum user.

Here are ten great books that should be on the shelves of every serious Spectrum user.

You'll find a collection of programs for graphics, games, business, sound and intelligence. You'll find tips for beginners, and machine code for boffins. You'll find you can really get the most from your Spectrum – simply and straightforwardly.

Order your Spectrum books from Sunshine now. See them in your local bookshop, or use the coupon below.

Sunshine books Direct Order Form

Sinclair ZX Spectrum books

The Working Spectrum	£5.95
Spectrum Adventures	£5.95
Master Your ZX Microdrive	£6.95
Machine Code Applications	£6.95
ZX Spectrum Astronomy	£6.95
Artificial Intelligence	£6.95
Spectrum Music	£6.95
Building with Logo	£6.95
Inside Your Spectrum	£6.95
Machine Code Sprites & Sound	£6.95

Look out for the Sunshine range in W.H. Smith's, Boots, John Menzies, other leading retail chains and all good bookshops.

Dealer enquiries: 01-437 4343

SUNSHINE

Send to: Sunshine Books
12/13 Little Newport Street
London WC2R 3LD

Please send me the following books:

Book_____

Book_____

Book_____

☐ I enclose a cheque for £_____ payable to Sunshine Books.

☐ I enclose a postal order for £_____ payable to Sunshine Books.

☐ Please charge my Visa/Access card No._____, valid from_____ expires end_____

Signed_____

Name_____

Address_____

A Fair Deal For Our Advertisers

No guesses, no wishful thinking – the circulation of this magazine is audited to the strict professional standards administered by the Audit Bureau of Circulations

ABC

The Hallmark of Audited Circulation

NEW MD1b/WD1b for TAPE TO DRIVE TRANSFER

48K Spectrum owners with Micro/Wafa/Disc drives can NOW transfer the MAJORITY of their programs (inc headerless, long programs, + those with LOW addresses – say 16384) with our newly IMPROVED package (incl bytes chop/split in one go, VAL creator (reduced Tasword by 1000+ bytes in 2 secs) remkill, make visible, etc, etc).

To transfer from tape you must convert the program, and then transfer the converted bytes. MD1B (or WD1b) has the programs giving you the tools to do the modifications to get them running. MD1 also has extra erase + true CAT program. (See your Spect No. 9 for recommendation.)

MD1b (WD1b for disc or Wafadrive owners) costs a mere £6.99.

As an EXTRA option to conveniently transfer converted bytes, with integrated header reader, option to alter program names, STOPS programs, etc, we have MT6 at £3 (for M/drive), or Wafatape at £4 (for Wafadrive owners).

UPDATE SERVICE: old customers can get the latest version on any product with a £2 reduction by sending old TAPE only, + SAE (large).

ALL PRODUCTS CARRY OUR MONEY BACK GUARANTEE (not updates).

OVERSEAS: add £1 Europe, £2 others for each product. SAE for enquiries.

PD172

LERM, DEPT PCW
10 BRUNSWICK GDNS, CORBY, NORTHANTS

SOFT INSIGHT — DISCOUNT SOFTWARE

	RRP	OUR PRICE
SPECTRUM		
DEATH STAR INTERCEPT.	7.95	6.20
WIZARDS LAIR	6.95	5.20
MOON CRESTA	6.95	5.20
EVERYONE'S A WALLY	9.95	7.20
DRAGON TORC OF AVALON	7.95	6.20
SOFT AID		4.99
ALL LEVEL 9 GAMES	9.99	7.20
TIR NA NOG	9.95	6.90
WHITE LIGHTNING	14.95	10.40
RAID OVER MOSCOW	7.99	5.90
UNDERWORLD	9.95	6.90
KNIGHT LORE	9.95	6.90
BRUCE LEE	7.99	5.90
SKOOL DAZE	5.95	4.45
MATCHDAY	7.95	5.65
HUNCHBACK II	6.90	4.85
SPY HUNTER	7.95	5.90
GRAND NATIONAL	6.95	5.20
B. JACKS SUPER STAR	7.95	6.20
MEGA HITS	19.95	12.95
ALIEN 8	9.95	6.90
EMERALD ISLE	6.95	5.40
ILLUSTRATOR	14.95	10.50
WORLD SERIES BASEBALL	6.95	5.40
GYRON	9.95	7.50
SHADOWFIRE	9.95	7.50
AMSTRAD		
THE HOBBIT	14.95	10.50
ALL AMSOFT GAMES	8.95	7.00
ALL LEVEL 9 GAMES	9.99	7.80
SORCERY	8.95	7.00
JET SET WILLY	8.95	7.00
EMERALD ISLE	6.95	5.40
ANDROID I	7.95	6.50
DARK STAR	7.95	6.50
GHOSTBUSTERS	10.99	8.50
CHUCKIE EGG	7.95	6.50
MILLIONAIRE	7.95	6.20
TANK BUSTERS	7.95	6.50
COMBAT LYNX	8.95	7.00
3D STAR STRIKE	7.95	6.50
DALLIES DECATHLON	8.95	6.70
KONG STRIKES BACK	7.95	6.20
HUNCHBACK II	8.95	6.70
COMMODORE		
ALL OF US GOLD	9.95	7.40
AIR WOLF	7.95	6.20
ALL ACTIVISION	9.95	7.20
ALL LEVEL 9	9.99	7.20
UP AND DOWN	9.95	7.40
TIR NA NOG	9.95	7.40
B. JACKS SUPER STAR	8.95	6.90
GREMLINS	9.95	7.40
PIT STOCK II	9.95	7.40
POLE POSITION	9.95	7.40
EMERALD ISLE	6.95	5.40
IMPOSSIBLE MISSION	8.95	6.70
ALL INTERCEPTOR	7.00	5.40
ROCKET BALL	7.95	6.20
WORLD SERIES BASEBALL	7.95	6.20
WHITE LIGHTNING	19.95	14.95
SPY HUNTER	9.95	7.40
LORDS OF MIDNIGHT	9.95	6.90
SUPER HUEY	11.95	9.00
BROAD ST	7.95	6.20
SOFT AID		4.99
THEATRE EUROPE	9.95	7.60
SHADOWFIRE	9.95	7.50
ATARI		
DECATHLON	9.99	7.40
GHOSTBUSTERS	10.99	8.50
PITFALL 2	9.99	7.40
RIVER RAID	9.99	7.40
SPACE SHUTTLE	9.99	7.40
POLE POSITION	9.99	7.40
DROP ZONE	9.95	7.40
BEACH HEAD	9.95	7.40
BLUE MAX	9.95	7.40
BRUCE LEE	14.95	12.00
FLAX	9.95	7.40
FORT APOCALYPSE	9.95	7.40
SPITFIRE ACE	9.95	7.40
ZAXXON	14.95	12.00
SOLO FLIGHT	14.95	12.00
F15 STRIKE EAGLE	14.95	12.00
QUASIMODO	9.95	7.50
CONAN (DISC)	14.95	11.50
GHOSTBUSTERS (DISC)	14.95	11.50

All prices include free fast delivery****
Please make cheques payable to Soft insight and send to SOFT INSIGHT, 17 Burgos Grove, Greenwich, London SE10. Access orders/enquiries 01-305 0790

PD107

1541 FLASH!

Do you get bored waiting for your disk drive to load your favourite programs?
Thinking of reverting to 'turbo' tape routines because they're quicker?
WAIT!!!
From SUPERSOFT comes a great NEW product which you can fit in minutes to upgrade your Commodore 64 and 1541 Disk Drive. All disk operations are speeded up as much as THREE times (for example, programs which normally take a minute to load will load in twenty seconds or less using FLASH!)
1541 FLASH! is 100% compatible with Commodore BASIC. However, if you really want to you can easily revert to the normal slow mode at any time – but we don't think you will!
If you take your programming seriously you can speed DATA transfers by up to 10 times normal speed (in your own programs), and can also make use of 11 screen editing functions, as well as 17 disk commands.
Pressing SHIFT and RUN/STOP becomes the same as LOAD"*",8,1 so you can start work about five seconds earlier each day!
Supersoft have 1541 FLASH! in stock NOW, so send your cheque for £89.95 or 'phone 01-861 1166 to order by Access.
P.S. Unlike some add-ons we could mention, 1541 FLASH! leaves you all your memory and the cartridge port available!

SUPERSOFT

Winchester House, Canning Road, Wealdstone, Harrow, HA3 7SJ
Tel: 01-861 1166 for further details and our free catalogue

PD404

LMT

LOOK!!! MASSIVE REDUCTION L.M.T. 68FX1 KEYBOARD

Featuring **a full size space bar** with dedicated numeric and cursor keypad. The LMT 68FX1 increases the number of keys from **40 to 65**. The full-travel sculptured keys with **high quality printed characters** ensures ease of use. To fit your Spectrum computer board into the LMT 68FX1 is **simplicity itself**. Full fitting instructions are included with every LMT 68FX1.

ONLY £39.95 (inc VAT & Carriage)

LMT COMPUTERS, UNIT 2, 274 BAKER STREET, ENFIELD, MIDDX EN1 3LS. TEL: 01-367 0035

COMING SOON Combined disk and printer interface only **£79.95 inc VAT.**

Tony Bridge's Adventure Corner

A classic game

This week let me mention a new program that is destined to become a classic for the Spectrum. The author of *Runestone* is Alan Davis, who will be well-known to regulars at The Corner for his comments on adventures. Temptation Software released Alan's first attempt, *The Journey*, some few weeks ago, and while it is a super program, it hasn't met with much success. Of course, adventures are becoming more and more popular now; this means that many fall by the wayside and just don't get the attention they deserve. But I would strongly recommend you to seek out *The Journey* – it's a little beauty!

Alan's latest effort is something even better. I'm afraid that parallels will inevitably be drawn between *Runestone* and the unfinished *Midnight Trilogy*, as Alan has opted for a similar technique – that of 'landscaping'. As you move around the adventure area, commanding one of several characters, the scene changes, just as in Mike Singleton's *Midnight*. The pictures are as pretty as those in Singleton's opus and evoke a similar sense of atmosphere and 'being there'.

Runestone is no mere copy, though, as Alan Davis has taken Singleton's original premise and made it into something much closer to the adventurer's heart than *Midnight*. That series has more to offer the wargamer, I feel, and will I'm sure, be used in a more complex way in the future. *The Runestone*, however, unlike *Midnight's* menu-driven command structure, accepts full-sentence text commands. Not only this, but the various edifices around the landscape may be entered and searched, and you will find other characters in these buildings who may be interrogated.

Just time now to mention 5D Software. None of the first release of tapes from this County Durham-based co-operative will be smash hits, but they are, nevertheless, excellent value-for-money. The collection that concerns us adventurers is *Cavern Chaos* and *Ptarmigan*, together on one tape with a bonus arcade game, *Fruity*.

Cavern Chaos is a large adventure concerning the hero's exploits beneath Milton Keynes, where a complex of caves has been discovered. The playing area is very map-able, with puzzles to be solved. The weirdly-named *Ptarmigan* is for the 16K Spectrum, and is "more suitable for newcomers to computing". Both these adventures are well programmed and well designed. At just £3.95 for the three programs, I recommend the tape to anyone looking for a not-too-taxing diversion.

5D Software is acting as a co-operative for program authors, and has secured 'highly cost-effective arrangements' with artists, printers and a tape duplicating factory, thus enabling impoverished programmers to get their work into print. A good idea, it seems. 5D Software, 12 Fleming Field, Shotton Colliery, County Durham DH6 2JF.

Now, at long last, to the Help! As much as I've been rather unkind to *Eureka!* over the last few months since its release, there's no denying that the program has been bought by many thousands, and a large number of those seem to have written to me asking for help. Actually, Domark, the producers, have a pretty comprehensive Help Sheet of their own, it would appear, by Scott Gardner of Lancashire, although I can't say whether he is credited or not with its authorship. It's an excellent piece of work, and Scott is to be congratulated for his detective work. I'm sure that Scott would be pleased to answer your questions if you write to him at 135 Manor Street, Accrington, Lancashire BB5 6DZ.

The first problem that many of us come up against is the so-called arcade game at the beginning of each adventure. There are a few enterprising souls who are now marketing programs to bypass them, including, for example, Mike Lever's tape, which is available at £3.99, from him at 45 Lilliesfield Avenue, Barnwood, Gloucester GL3 3AQ.

All of these will get you straight into an adventure, and this one will give you 100% vigour. Scott Gardner has given me a little routine which will also bypass the arcade sections.

CLEAR 23999:LOAD " " CODE:POKE 58117,0:RANDOMIZE USR 58112 (This is for the Spectrum version – Commodore users are out of luck, I'm afraid)

Now to the adventures themselves: *Number 2:* How do I rescue the Man? 4,21 How do I greet Nero? 19,6 (when in Rome. . . !) Where is the Eagle? 3,17,12,26 *Number 3:* How do I sail the boat? 22,10 What do I do in the Chapel? 20,9 What do I do with the Grease? 18,2 *Number 4:* What do I do in the darkroom? 24,16,14,5,23,8,1,8 How do I pass the guards on the railway? 24,11,13,11 *Number 5:* What do I do with the bottle? 25,6,15

Now for some general hints (not in code, so close your eyes if you don't want to know just yet) – first, from Mad Al the wizard, from Maidenhead.

Prehistoric: Get that Von-Bergie with your copper, give the dinosaur an explosive sensation, go underground for the temporal talisman!

Roman: Use your potion wisely, a quick dip will get you in. Nero has a burning desire to see Rome through his *window!*

Arthurian: Ambush a waiting beast, Arthur wants to go boating!

Colditz: Mined (!) your bayonet, catch with your hat, Insects – yeuck!

Carribean: attack friendly guards, burn the door, then put out the fire, smash your receiver and magnetise the key, inflate the ore crusher and jump off (the rod kills!), examine drawer – flick it!

And finally, help of a particular sort from Toby Ridge (sounds familiar!):

Roman: to get the Dragon's tooth – Get Hammer and Chisel, Get Axe from Farmer's House, Get Stone from Stream (see earlier clue), Go East from Mine to Trees, Chop Trees, Go East to Mine, Dig (with Spade), Use Chisel – EUREKA!

Now to some Help I was asking for in *Zkul* for the QL: Michael Morgan has very quickly replied: To get the dwarves to feed you, just *Look* when a dwarf has disappeared, and you will see some food. Of course, it may be poisoned. . . And to get back up the rope, all you have to do is lift up the drum of paraffin, then take to the rope and type *Up*. Thanks for the help, Michael – as to your question about machine-code on the QL, why not try the book by Andy Pennell, *Assembly Language Programming on the QL*. It's available from Sunshine Books, 12-13 Little Newport Street London WC2.

1 Make 2 Sword 3 In 4 Save 5 Film 6 Then 7 Caesar 8 I.D. 9 Sins 10 Boat 11 Dynamite 12 By 13 Place 14 Develop 15 Carry 16 Photo 17 Chest 18 Grease 19 Ave 20 Tell 21 Man 22 Push 23 Stamp 24 Take 25 Open 26 Stream

Adventure Helpline

Going bananas? If you are stuck in an Adventure with nowhere to turn do not despair – help is at hand.

Fill in the coupon, explaining your problem, send it to us, and a fellow adventurer may be able to help.

Remember – the system only works if those adventurers who have solved the puzzles get in touch. Every week is Save An Adventurer Today (SAAT) week!

Adventure..... **on (Micro)**.....
Problem.....
.....
Name.....
Address.....
.....

CLASSIFIED

Semi-display — £6 per single cc
Lineage — 25p per word

CALL *DIANE DAVIS* ON *01-437 4343* FOR SEMI/DISPLAY ADVERTISING

GAMES SOFTWARE

ZX81 SOFTWARE

* Special Offers from £199 *
Send s.a.e. for brochure to

BRIDGE SOFTWARE

103 Hillside Road,
Corfe Mullen
WIMBOURNE BH21 3SG PL295

NEW VIC-20 SOFTWARE

MAZE OF ENIGMA

3-D Maze Adventure of the 16K VIC with unique 40 column text display. Superfast 3-D Maze, Hi-Res graphics, Mind Boggling puzzles, Save/Load to cassettee, 100% Machine Code.
Terrific value at just £4.99 from

'alternatives'
127 Lake Road West,
Cardiff CF2 5PJ
PL318

NEW HORIZONS SOFTWARE present BUGBURST and CHOMPER

for the 16K ZX81
Only £4 each or £7 for both. Fast machine code arcade action.
Make cheques/POs payable to New Horizons Software, Four Winds, Cwm Lane, Rogerstone, Newport, Gwent NP1 9AF. (SAE for details, catalogue). Overseas customers add £1. PL304

JUPITER ACE software! Adventure game + space action game £3.00. Also utilities, graphics, assembler (s.a.e. for lists). S. Leask, Robinson College, Cambridge.

MOTHERLODE is an adventure for the Spectrum 48K in which only the best survive. Try Motherlode for only £4.00. Send chequest to A. Swinton, 9 Sunningdale Close, Newton Hyde, Cheshire SK14 4JJ.

THE TESTING QUEST. A 28K text adventure for the Commodore 64. Only £2.95 including p&p. Send cheques to T. Lewis, 97 Spencer Road, Isleworth TW7 4BW.

SPECTRUM 16/48K Amazing value, Zaxxon, Frogger, Missile Command, one £5.95, twqo £7.95, three £9.95. Cheque/PO to P. Broda, 108 Rhedyw Road, Llanllyfni, Carnarvon, Gwynedd, LL54 6SW.

ACCESSORIES

MEMOREX or MAXELL DISKS
88p + VAT

ABACOM COMPUTER SUPPLIES
225 WALTON ROAD, WOKING, SURREY
Tel: 04862 71563
(after 7pm) PL283A

Bulk Pack MEMOREX 5¼" DISKS

	10	50	100
SS/DD (48tpi)	10.80	47.50	88.00
DS/QD (96tpi)	20.40	98.00	191.00

Add p&p: 50p per 10, £1.50 per 50, £2.50 per 100
Add VAT at 15%. Box provided free

ABACOM COMPUTER SUPPLIES
225 Walton Rd, Woking, Surrey GU21 5EF
Tel: 71563 (after 7pm)
(Mail order only) PL302

Self Adhesive Cassette & Disk Labels

CASSETTE LABELS – On A4 sheets, 12 labels per sheet, 100 labels – £3.50, 1000 – £21.85
Rolls of 500 labels, on tractor feed backing paper for overprinting by computer printer.
White – £14.66. Tints available – Blue, Yellow, Pink, Green, Orange or Grey – £16.90.
DISK LABELS – Rolls of 500 labels, on tractor feed paper: White – £12.75. Tinted – £15.

The above prices are VAT & carriage inclusive
For our full price list and sample brochure
Telephone (0795) 28425 (24 hrs)

INDUSTRIAL PROCESS
Self Adhesive labels – *SUPERFAST*
Unit A4, Smeed-Dean Centre, Eurolink Way
Sittingbourne, Kent ME10 3RN PL83

EPROM SPECIAL

2708	8K	£6.00
2716	16K	£6.50
2732	32K	£7.50
2764	64K	£9.90
27128	128K	£19.95

Cash with order to:
ELECTRONIC COMPONENTS
45, CHURCH ST
ENFIELD EN2 6AT PL0A

CLUBS

THE BRAINDRAIN SOFTWARE CLUB

If you own a ZX Spectrum, Commodore 64 or Amstrad CPC464 then you simply must join the BRAINDRAIN SOFTWARE CLUB.

For a £2.00 membership fee you will receive.

A plastic Membership Card
Introductory Letter
Competition Entry Form
Newsletter
Discounted Software List

As a Club Member you are able to order software at greatly reduced prices from our large supply of excellent games.
In addition you can enter monthly prize draws and major competitions which give YOU the chance to win some FABULOUS prizes including dot-matrix printers and computers! You will also receive regular copies of our magazine, 'SOFT CHAT'. Inside are news and views of the software world, games reviews, details of our special offers and competition announcements.

Cheques and Postal Orders can be made payable to BRAINDRAIN.

BRAINDRAIN SOFTWARE CLUB,
Dept. PCW,
11 Park Hill Road,
London E4 7ED.

BUT HURRY IF YOU WANT TO ENTER OUR £100 WORD SEARCH COMPETITION
PL321

BBC 27128 EPROM

Hitachi 250 nS prime stock
For BBC sideways ROM, etc.
1-2 pieces **£8.26** + VAT = **£9.50**
3-49 pcs. **£7.39** + VAT = **£8.50**
50-99 pcs. **£6.92** +. 100 up **£6.52** +.
Delivery normally by return of post
Send UK cheques, Money Orders to:
Dept. PCW, SILICON CITY,
1 Milton Road,
Cambridge CB4 1UY.
Access/Visa orders,
phone 0223 312453
PL320

Own Business

"MAKE MONEY with your own computer", the practical working manual that can guide you into this exciting new field – £10 post free from M. Abbot, 274 Weeland Road, Sharlston, Wakefield, West Yorkshire WF4 1EA.

ESTABLISH your own micro business. Send stamp for details of unique publication. BLS(P) Marlborough, Dairylands Road, Church Lawton ST7 3EN.

CLASSIFIED ADVERTISING RATES:

Line by line: 25p per word, minimum 20 words.

Semi-display: £6 per single column centimetre, minimum length 2 cm. (Please supply A/W as PMT. Or supply rough setting instructions.)

Conditions: All copy for Classified section must be pre-paid. Copy date 7 days before publication.

If you wish to discuss your ad, PLEASE RING Diane Davis 01-437 4343.

Here's my classified ad.

(Please write your copy in capital letters on the lines below.)

		Please continue on a separate sheet of paper	

I make this ..... words, at ..... per word so I owe you £ .....

Name .....

Address .....

.....

.....

Telephone .....

Please cut out and send this form to: Classified Department, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

TO ADVERTISE *YOUR* SERVICES IN THIS SECTION CALL; P.C.W. CLASSIFIED ON 01-437 4343.

T.V. SERVICES OF CAMBRIDGE LTD
REPAIRS – SPECTRUM ZX81

Fast reliable repairs by experienced engineers, having serviced Sinclair computers since the introduction of the ZX80. Our price is *inclusive* of all parts, labour, postaged and VAT irrespective of fault*. No hidden charges.
Spectrum £18.75, ZX81 £11.50, 16K Ram £9.95.
**While-you-wait service available.*

Call or send with Cheque or P.O. to:
TV SERVICES OF CAMBRIDGE LTD.
French's Road, Cambridge CB4 3NP
Tel: 0223 311371 PL111

Faulty Spectrum
Ramco-Mecina

a *We will repair your Spectrum correctly*
b Test your Spectrum for 24 hours
c Find any other *hidden faults* and repair these *free of charge*

Send unit with cheque/PO for £18.75 to:
Ramco-Mecina, Dept S, 34 Murray Street, Salford 7, Manchester M7 9DU
(NO CALLERS AT PREMISES)
Tel: 061 792 2260 PL120

Computer Repair Centre

Have you got problems with your computer? Then call us for:
Commodore, BBC, Spectrum, Dragon
Mail order or call in
Enfield Communications
135 High Street, Ponders End, Middx
Tel: 01-805 7772 PL143

HEMEL COMPUTER CENTRE LTD.

For fast reliable repair service, send your 16/48K Spectrum computer to us.
We will repair and return for £20 + £1.60 p&p.
Also BBC, Commodore, Atari and Dragon service.

Hemel Computer Centre Ltd.
52 High Street,
Hemel Hempstead,
Herts HP1 3AF.
Tel: 0442 212436 PL60

AMSTRAD
NEW TAPE UTILITY V2.0

Convert all your slow loading software up to 4 times faster. Easy to use choice of 10 reliable speeds, removes protection, the only one that handles headerless files now copes with more! Only £5.95 + integral header reader £13.50 on disk.

SIREN SOFTWARE
76 Bridge St
Manchester M3 2RJ

BBC SPECTRUM REPAIRS

★ Spectrum repairs £18.50 inc. parts insurance and p.p.
★ BBC B repairs £18.50 + parts, insurance and p + p.
Send your computer with cheque or P.O. for £18.50 and description of fault to:

SUREDATA (PCW)
Computer Service
45 Wychwood Avenue, Edgeware, Middx.
Tel: 01-951 0124 PL53

BUSINESS & COMPUTER SERVICES are also computer consultants, specialising in small (and very small) businesses. Write or phone us at 294a Caledonian Road, London N1 1BA. Tel: 01-607 0157.

COMPUTER REPAIRS IN SOUTHEND

SPECTRUM, BBC, ELECTRON, CBM 64, VIC 20
MINNIE MICRO ELECTRONICS
12 Eastern Esplanade, Southend
Tel: 0702 62033/615809
Open 7 days a Week PL119

HOME COMPUTER REPAIRS

Look at our fantastic prices on repairs

VIC 20	£20.00
Commodore 64	£32.40
Dragon 32	£36.00
ZX Microdrive	£17.25
ORIC 1/Atmos	£25.00
ZX Interface 1/II	£17.25
ZX Spectrum	£17.25

plus others

Above prices are inclusive for all defects

All repairs carry 3 months' warranty on replaced parts

SPECTRUM UPGRADE TO 48K £29.95
Ring for full details: (0234) 213645

ZEDEM COMPUTER LTD
2 Kimbolton Road, Bedford PL113

SPECTRUM REPAIRS

We expertly repair Spectrums for £17 inclusive of parts, labour and return postage. Spectrums upgraded to 48K for £34 including post.

R. A. ELECTRONICS,
133 London Road South, Lowestoft NR3 0QZ
Tel: (0502) 66289 PL45

TO HIRE a computer from Spectrum 48K upwards, please phone or write to: Business & Computer Services, 294A Caledonian Road, London N1 1BA. Tel: 01-607 0157 or 01-997 6457.

COMMODORE REPAIRS by Commodore approved engineers. Vic 20 Modulators £6.50. Vic 20 from £14.50, CBM64 etc. for more details write or tel: G. C. Bunce & Son, 36 Burlington Road, Burnaham, Bucks SL1 7BQ. Tel: 06286 61696.

BLANK CASSETTES
WITH LIBRARY CASES

	C10	C15	C20	C30
10	3.65	3.85	4.00	4.00
50	14.00	14.15	14.30	14.30
100	25.00	26.00	27.00	27.00

Fully Inclusive (COD 65p extra)
Superior Tapes. Don't Settle for Less!

★ ★ ★

5¼" DS/DD DISKS
10 for £13.00 fully inc

★ ★ ★

RING US NOW! (0793) 695034
UK HOME COMPUTERS
82 CHURCHWARD AVE, SWINDON, WILTS SN2 1NH PL305

SPECIAL OFFER FOR ATARI 400/500/800 OWNERS
Hire first 2 games **FREE** from our extensive range of software. Latest releases! Apply now! Also, Atari hardware & modems for sale at discount prices.
For further details send SAE to
CHARNWOOD GAMES, 27 WARWICK AVENUE, QUORN, LOUGHBOROUGH, LEICS.
TEL: 0509 412604

FAST COMPUTER REPAIRS

VIDEO VAULT INTERNATIONAL
10★ REPAIR SERVICE

Spectrums repaired for £19.95 inc. Parts, Insurance and P & P No Hidden Extras.
BBC, Commodore 64, Vic 20, Atari, Quoted for.
Are you fed up with waiting weeks for your Home Computer to be repaired!!!
Why not try the Experts, we offer a full repair service on any Home Computer.
All repairs carry a full 3 months guarantee, plus on every Spectrum repaired we send you a free game worth £5.95 for your enjoyment and pleasure.

★ **While you wait Service by Professional Computer Engineers.**
★ **3 Months written guarantee on all repairs.**
★ **International repair company.**
★ **All computers sent by mail order turned around in 24 hrs.**
★ **Most Spectrums repaired within 45 minutes.**
★ **All Micros insured for return journey.**
★ **Open 7 days a week.**
★ **School repairs undertaken-discounts available.**
★ **Free software with each Spectrum repaired worth £5.95.**
★ **Over 8 years experience working with computers.**

ONLY GENUINE SINCLAIR PARTS USED.
Phone today for your free estimate or send your computer to us with £1.75 (UK EIRE I.O.M. C.I.) or £6.50 (Europe/Scandinavia) we will contact you the same day by phone or 1st class Mail should you require quotation first.
TRADE EQUIRIES MOST WELCOME ACCESS WELCOMED
VIDEO VAULT INTERNATIONAL LTD (DEPT R24) THE LOGICAL CHOICE

VideoVault

Telephone: Glossop (STD 04574) 66555.
140 High St. West, Glossop, Derbyshire, England.

FREE GAME WORTH £5.95 WITH EACH SPECTRUM REPAIR.

FAST SPECTRUM AND BBC REPAIRS

First company in all UK. to introduce while-u-wait service. Now first to offer an international repair service.

"I have come across a firm that will be more than willing to advise you as to how to remedy your problem. They are called MANCOMP, and as well as repairing faulty Spectrums, are also quite willing to discuss your problems with you, and offer reasonably cheap, and **(more importantly)** correct cures"

PHIL ROGERS 'Peek & Poke' "POPULAR COMPUTING WEEKLY" January 1985 (Vol IV No 1).

AVERAGE £15

- MOST SPECTRUMS REPAIRED IN 45 MINS
- PLEASE PHONE FOR APPOINTMENT FIRST
- OR PHONE/SEND SPECTRUM FOR FREE ESTIMATES. ENC £1.80 (U.K. I.O.M. EIRE, C.I.) £6.50 (EUROPEAN/SCANDINAVIA)
- NO HIDDEN HANDLING CHARGES
- 24 HOUR TURNAROUND
- EVERY MICRO INSURED FOR RETURN JOURNEY
- OPEN TILL 7PM MON – SAT
- KEYBOARD FAULTS £9

Engineers Wanted

Z80 – £1.95* (p&p 20p)
4116 – £1.10* (p&p 20p)
4532 – £3.00* (p&p 20p)
Upgrade Kit – £27.00 (p&p £1)
Upgrade Fitted – £34.00

MANCOMP LTD.
(Dept PCW), Printworks Lane, Manchester M19 3JP.
Tel: 061-224 1888

MANCOMP LTD

SINCLAIR COMPUTER REPAIRS

SPECTRUM £17.50
ZX PRINTER £18.50

Inc. parts, p + p, and return insurance. Spectrums upgraded to 48K for £28. At present we cannot upgrade issue one. We like to take care of your computer – please pack carefully – and send with cheque or P.O. to:

I.T. (WESTERN) ELECTRONICS
97 Newtown, Trowbridge, Wilts BA14 0BB.
Tel: 02214 54074

PL54

CHILTERN COMPUTER SERVICE

FOR FAST RELIABLE REPAIR SERVICE

SPECTRUM £18.00

WE ALSO REPAIR CBM 64 & BBC, VIC 20, ORIC, DRAGON, AMSTRAD, PRINTERS & DISC DRIVES

Ask for details.
We give 3 months warranty on replaced parts
Send computer with details of fault and cheque made out to: New Crown Computers Ltd:

CHILTERN COMPUTER CENTRE
76B DALLOW ROAD, LUTON, BEDS
TEL: 0582 455684
Overseas enquiries welcome

PL281

QUALITY SPECTRUM PRINTOUTS: £2 each for listing, text file copy (Tasprint available), or Screen /graphics file package (choose 8 copies @ 3 × 2, 4 @ 6 × 4, 1 @ 12 × 8). Repeats £1. Cassettes to Spectraprint, 119 Derby Road, Duffield, Derby, with remittance.

SOFTWARE

SOFTWARE DESIGNED for any application to your own specifications for most micros. Full after sales support guaranteed. You retain program copyright. We offer flexible terms and unbeatable rates. Write for free quotation – Digital Design Studios, Frant End, Forest Road, Tunbridge Wells, Kent.

TELETEXT ON YOUR SPECTRUM 16K/48K £4.95

Create your own full-colour teletext system using "ZXTEXT". Up to 900 pages of text and graphics, 24-hour clock, alarm, rolling pages – it's all here!
Free sample system included to get you started.
£4.95 from
IAIN STEWART, 17 Torry Drive, Alva FK12 5NQ

PL316

INVESTORS – 48K SPECTRUM

MONITOR – SHARES · GILTS · UNITS · BONDS

Automatic valuation and performance details. Aids decision making. Invest more actively.
Can you afford to be without it?
THE INVESTMENT MONITOR £12 inc. p&p
Michael Slatford Software, 3 Campden Road, S. Croydon, Surrey CR2 7EQ. SAE for details.

ADDRESS BOOK

*** COMMODORE 64 ***

FULLY MENU DRIVEN * USER FRIENDLY * COMPREHENSIVE ENTER * AMEND * DELETE * SEARCH * SEARCH BY CLASSIFICATION * BIRTHDAY LIST * DIRECTORY * PRINTOUT OPTIONS * 1520 P/PLOTTER COMPATIBLE
ONLY £9.95 inc P&P
FIRSOFT, 7 BARLOW ROAD, WILSMLOW, CHESHIRE SK9 4BE

HOME ACCOUNTS. Put your house in order! Comprehensive coverage of bank accounts, credit cards, HP, etc, inbuilt accuracy check. Projects cash flow for any period. Available for CBM64, VIC 20, BBC & Electron £8.45. Free details from: Discus Software, Freepost Windmill Hill, Brixham TQ5 9BR. Tel: 808 45 55532.

TELEX YOUR CLASSIFIED COPY TO:

296275 SUNRGY

HA5

STOCK CLEARANCE of brand new Business & Utility programs, due to re-design for Microdrive. We wish to clear this stock at cost prices.

It should be noted that programs will not work with INTERFACE 1 — Plus 80 programs work only with Kempston S Interface.

	Usual Price	Price Now	Tick Order
ZX81 M/C Text Tool	£9.95	£2.50	
Spectrum M/C Text Tool	£9.95	£2.50	
Spectrum Editor Assembler	£9.95	£2.50	
Master Tool Kit	£9.95	£2.50	
Address Manager	£8.95	£2.50	
Plus 80 Editor Assembler	£19.95	£3.50	
Plus 80 Address Manager	£19.95	£4.50	
Plus 80 Finance Manager	£19.95	£4.50	
Chess The Turk	£8.95	£4.50	

SPECIAL OFFER — ZX SPECTRUM POWER SUPPLIES 9V 1.4 AMP — BRAND NEW — £9.95 — £3.90

PRICE INC VAT & POST IN UK

Send cheque, postal order or Access/Barclaycard No to address below. Or telephone order with Access/Barclaycard No to (0753) 888866.

NAME .....

ADDRESS .....

Access / Barclaycard No ..... Expiry date .....

DCP LTD, 77A PACKHORSE ROAD, GERRARDS CROSS, BUCKS. SL9 8PR

UTILITIES

CBM64 divide memory into three 12K workspaces. Work area without disturbing other. Listing £1.00 + SAE. David Miller, 38 Exeter Garden, Ilford, Essex.

EPROMS 2764 new unused £7.25 ea 10's £7.00 ea 100's £6.00 ea. Send cheque payable to S. J. Chappell, c/o Hollywood Video, 48 Wheata Road, Sheffield S5 9FL.

AMSTRAD CPC 464

UTILITY PROGRAMS FROM PRIDE

Always the first and the best software. Offering more features and better value for money than other similar programs available. We also offer a fast reliable and friendly mail order service. SAE for details of our other CPC 464 utilities.

SYCLONE Convey your programs to load in up to four times faster.
★ Commands available from basic
★ Choice of our loading speeds, 1000 to 4000 baud
★ Comprehensive header reader
★ Load and list protected basic programs
List your "Welcome" tape. Cassette £5.95 inc P&P.

TAPE TO DISC CONVERSION

TRANSMAT Transfer your programs onto Amstrad Disc System.
★ Faithfully transfer cassette based software to disk
★ Add relocator if necessary
★ Auto or non auto modes
★ Erase or rename programs
★ Comprehensive header reader
Cassette £7.95 in P&P

SPECIAL OFFER WORTH £3.95

Buy both and get a cassette containing a real time digital alarm clock **FREE** including its P&P (While stocks last!)

Europe – add £1.00 per title
rest of world – add £1.50 per titles

PRIDE UTILITIES LTD (PW)
7 CHALTON HEIGHTS
CHALTON, LUTON, BEDS LU4 9UF
Cust. Enqs: Tel. 0582 411686 (bet. 9-10am) PL315

USE VTX 5000 on Bulletin boards! "Specnet" program £5.95. "Specterm" for any hardware RS232 board, £5.95 (both full facilities, down/up load, microdrive/tape, send control chr$). Stephen Adams, 1 Leswin Road, London N16 7NL. Tel: 01-254 1869.

GRAPHIC LPRINTER

SEND SAE FOR DETAILS

A TEXT PLANNER FOR TANDY CGP 115 WITH, KEMPSTON INTERFACE 48K SPECTRUM

THIS UNIQUE PLANNER COMES WITH U.D.C. PROGRAM & A NEW UPPER CASE CHARACTER SET, AS ABOVE. SEND CHEQUE/P.O FOR £12.50 INC. VICTAGRAPHICS, 7 SPEECHLY DR, WESTERN SPRINGS PARK EST. RUGELEY, STAFFS. WS15 2PT : TEL:(08894) 78230

EDUCATIONAL SOFTWARE

RESEARCH METHODOLOGY. (Q.L. & Spectrum) An educational program on this subject is due to be released later this year. If you are interested, telephone 'INOMINATE' on (0704) 36894 or (0942) 724342.

DEVA

Educational Software for 48K Spectrum

LOCK-KEEPER. Ever worked a canal lock? Well, this program shows you how, then offers 6 different tests just to make sure you can! Encourages reasoning and ordering skills. Age range: 10+ **£5.50**

REALM. Nine Centuries of Monarchy. A colourful and musical guide with length of reigns, matching, recall quizes. Age range: 8-13 years. **£4.50**

CARING FOR YOUR TEETH. Highly entertaining and instructive! Tooth structure, prevention of decay, with multiple-choice quiz. Age range: 8-14. £5.50

Please make cheque/PO payable to:
DEVA EDUCATIONAL SOFTWARE, 33, Upton Drive, Chester. CH2 1BY.

PL312

EDUCATIONAL SOFTWARE. Most home computers. For your free 24-page brochure, send to Jander Software, Edgbaston House, Broad Street, Birmingham.

USE YOUR DRAGON* for chemistry O-level revision or comprehensive home finance analysis. Either set (2 tapes each) £6. Send SAE to Pensoft, PO Box 1, Penicuik, Midlothian EH26 0RG for details (state which set). (* These programs require Compusense HI-RES or EDIT + ROM.)

COURSES

LEARN 'BASIC' programming in luxurious surroundings. We have places on our Autumn course. For details of a holiday with a difference telephone 'INOMINATE' on (0704) 36894 or (0942) 724342.

LEARN TO USE COMPUTERS

AT:

COMPUTER WORKSHOP

*Details:*01-778 9080 PL112

RESIDENTIAL COMPUTER COURSE. Software/Hardware, Weekend/Weeks. For further details contact: Jaysoft Micro Developments, Blackladder Bank, Greenham, Berwickshire. Tel: 036 16458.

THIS SPACE FOR SALE

£18

TELEPHONE:
PCW CLASSIFIED
01-437 4343 Ext 206 HA1

AMSTRAD

AMSTRAD CPC 464

TOOLBOX. Our best-selling Graphics & Sprite creator, plus M/C Monitor utilities. Still only £4.95.

GRASP. Fast & easy graphs and function plots. Education, business, hobbies. £8.50.

Special Offer

For PCW readers only, as a thank-you for your support, our new graphics adventure SMUGGLERS COVE is offered for only £1.99 (normally £5.50). SEND THIS AD WITH ORDER.

Cheques/POs to:
CAMEL MICROS, Wellpark, Willeys Ave., Exeter EX2 8BE. Tel: (0392) 211892.

PL306

AMSTRAD CPC464

Crystal Theft, a new adventure, challenging, different – can you survive?

Introductory price £2.99

WICCA-SOFT, 107 Bollington Rd, Bollington, Macclesfield, Cheshire SK10 5EL

WICCA-SOFT

PL319

AMSTRAD CPC464 ADVENTURES

CAN YOU HANDLE ANGELIQUE?

"A festival of entertainment" Top rating **HCW** March '85
"I recommend it highly" **PCW** March '85

ANGELIQUE: A GRIEF ENCOUNTER **£6.50**
BRAWN FREE! Nearly free **£2.00**
A full size adventure, a silly price (UK only)
ALL ARNOLD Adventures still available at **£6.50** each
Cheques/POs for immediate despatch or enquiries to:

NEMESIS (PCW)
10 CARLOW ROAD, RINGSTEAD, KETTERING, NORTHANTS NN14 4DW. PL314

ADVERTISERS PLEASE NOTE

VAT

MUST BE ADDED TO ALL ADVERTISEMENT RATES AT 15% FROM MAY 1st

HARDWARE

ALL TYPES OF BUSINESS COMPUTER SYSTEMS BOUGHT, SOLD AND EXCHANGED

SAGE SOFTWARE AVAILABLE
ALL TYPES OF NEW EQUIPMENT SUPPLIED

CALL: 0602 761067
AURAGOLD COMPUTING LTD
"MAINLINE", ST. ALBANS ROAD, BULWELL, NOTTINGHAM

FOR SALE

INSIGHT VDU model VDT/1, hardly used. £250 ono. Henley on Thames (0491) 574902 or 575451.

CBM64 + 1541 disk drive + C2N + 2 joysticks + £400 of software, and £110 of books, 7 months old, still under guarantee. Sell for £450. Tel: 01-485 4317.

NEC PC8000 system, Dual Disks, high-res colour monitor, Epson printer, various extras. Suit small business. £775 ono. 01-233 8239 (office).

TANDY DMP 100 printer. Centronics parallel, serial RS232C 80 column, graphics, tractor feed. Excellent condition. Bargain £99. Tel: 0524 732969.

RECRUITMENT

Would you like to work in **BRIGHTON** with the rest of the **JAMES BOND** team?
SOFTSTONE needs good m/c programmers to join us for our next 3 major projects
FULL TIME/FREELANCE!
Call Tony on 01-482 5232
PL300

MAKE YOUR PROGRAMS MAKE MONEY!
If you have a game, utility or application to sell, with a view to publishing (particularly CBM64 or BBC B) phone
JOHN COOK ON:
01-437 4343
PL40

URGENTLY REQUIRED PROGRAMMERS
For Amstrad and BBC. Have you written one or more of these?
1. Arcade games
2. Strategy games
3. Sports programs

Contact:
STARBURST SOFTWARE
Gothic House, Barkergate
Nottingham, NG1 1JU
Tel: 0602 505534
PL0C

YOUNG MAN seeks employment in software house or similar; extensive knowledge of home computers and software (worked as reviewer for P.C. games) and one years computer training. (Move from Birmingham if accommodation offered). Tel: 021-352 0395.

DUPLICATION

jbs records
COMPUTER PROGRAMS
REAL-TIME or (Slow) HIGH SPEED Professional Cassette Duplication and Blanks from 1 to 1,000 +. Computer printed Cassette labels, BBC disks. Fast Security Delivery service.
jbs records—a division of FILTERBOND LTD, 19 Sadlers Way, Hertford SG14 2DZ.
0992—551188
PL60

DATA DUPLICATION and BLANK CASSETTES M.G. COPIES
Burntwood, Walsall, West Midlands
Tel: 0543 480887 or 0543 675375 (24 hrs)
PL130

Dear Reader, my name is Simon Stable. I specialise in real-time data-duplication for most cassette based micros. Disc copying for BBC 40/80 (protection available). Dot-matrix printed labels blanks. Blank Cassettes.
FAST TURNAROUND **0869 252831** COMPETITIVE PRICES
P/L. FREEPOST, 46 WESTEND, LAUNTON, OXON OX8 6BR PL37

QL SOFTWARE

Q.L.
BANK ACCOUNT
Why Go Overdrawn? Control your Bank Account easily
Auto Standing Orders, Full Screen Entry, Analysis, Simulation, Prints Statement
Full Help Text **£8-00**
Mr K. J. Gouldstone
45 Burleigh Avenue
Wallington Surrey SM6 7JG. PL182

QL FRENCH
A French vocabulary learning program, ideal for use at "O" level.
£11.90 inc p&p.
Cheques/POs payable to Mr Yanni Papastavrou at
CAMSOFT
25 Newmarket Road, Cambridge CB5 8EG
PL312

WANTED

WANTED Sharp MZ-80A. Also interested in matrix dot printer. Tel: 0272 735025.

SUNSHINE
is seeking authors for new titles to add to its highly original and successful book range. Experienced and first time authors are invited to submit manuscript, ideas or fields of interest.
Full details of what we can offer from David Lawrence, Book Editor, Sunshine,12-13 Little Newport Street, London WC2R 3LD.
Sunshine Publishers of Popular Computing and Dragon User.
PL31

MAGAZINES

commodore HORIZONS

COMMODORE HORIZONS
Special offer! For a limited period only!
Take out a year's subscription to Commodore Horizons now and receive one of three Sunshine books – absolutely free! Simply send us £10 together with your name and address and your choice of book to:
Commodore Horizons, Special Subs Offer
12-13 Little Newport Street
London WC2H 7PP
Don't delay – post now!
Books
1. **Machine code graphics & sound on C64**
2. **Artificial intelligence on C64**
3. **Building with Logo on C64**
PL188

DRAGON USER
To make the most of your Dragon you need **Dragon User** — the independent magazine for Dragon owners. To make sure that you receive a copy of Dragon User regularly subscribe direct to us. A year's subscription costs £10 for 12 issues (overseas rates available on application). Send a cheque or postal order made payable to Dragon User, and accompanied by your name and address, to Dragon User, Subscription Department, Oakfield House, Perrymount Road, Haywards Heath, Sussex RH16 3DH.
PL32

DISTRIBUTION

HARBOURSOFT
(Distribution)
Distribution of unusual software and peripherals direct to the retailer.
Regular fortnightly deliveries covering an area from Penzance to Birmingham, Bristol to Bournemouth. Most items carried in stock for immediate delivery on C.W.O.'s. No order too large or small – 1 to 100 we don't mind.
Phone **HARBOURSOFT** on **0305 820487** for details of our next run to your area or write to **134 East Weare Road, Portland, Dorset**
We supply what the others can't get! PL225

Computer Swap 01-437 4343

Free readers entries to buy or sell a computer.
Ring 01-437 4343 and give us the details.

Acorn for Sale

FOR SALE BBC B micro built in Wordwise Word Processor, tape recorder, software (inc. Hobbit), mags and books, £360 ono for the lot. Tel: (0785) 850268 and ask for Carl.

BBC colour monitor, Microvitec Cub model 1451 MS, as new, little used, £200. Tel: Basingstoke 51623.
BBC software, Hunchback, Frogger, Planetoid, Meteors, Spitfire, Wall, £2.50 each, Hobbit, Snowball, £5 each. Fortress disc and clean replica disc, £5 each. Joystick interface, £4. Tel: Basingstoke 51623.
BBC B 1.2 o/s large range of accessories, Cheetah, Sweet Talker, Eprom Eraser and programmer plus Prism Acoustic Modem, £290. Tel: 07073 39063 after 7pm.
BBC software for sale: Sabre Wulf, Mr EE, Manic Miner, 3D Grandprix, Fortress, Micro Olympics, Starstriker, Zarm, Maritan Attack, Son of Blagger, Frogger, Felix + Fruit Monsters, £3 to £5. Tel: Bakewell 3652.
ACORN ELECTRON, cassette recorder and £100 of software and magazines, only 5 months old, cost £310+. Sell £199 ono. for quick sale. Tel: 031-229 6692 after 4pm. Buyer collects.
ACORN ELECTRON Sayno hi-res monochrome monitor, data recorder, books + s/w, guaranteed, £230 ono. Tel: Little Gaddeston 3557 after 5pm.
ACORN ELECTRON + £100 or original s/w, excellent condition, £110. Tel: (0705) 375955. Bill Rogers.
BBC B + 2 35 track drives, £390 ono. Tel: 01-580 3766 (day), 01-673 6068 (eves). Dave.
BBC B 1.2 o/s. Acorn data recorder, joysticks, s/w, leads + manuals, excellent condition, £300. Tel: 01-485 1827 after 4pm.
ACORN ELECTRON and cassette recorder + 6 games and manuals 8 months guarantee also 5 blank cassettes, £120 ono. 297 Blackwell Road, Carlisle, Cumbria CA2 4RW. Tel: 33694.
BBC COMPUTER + DFS. 200K disc drive, plus lots of software, incl Elite, Beta-Base, and books and magazines, £550. PRestel Modem, £40. Stephen. Tel: 01-642 2831.
BBC B AScorn recorder, magazines, over £150 software, 3 months old in excellent perfection, fantastically new, only £300. Great deal, you won't regret it. Contact, Afzal. Tel: 061-273 8051 eves.
ACORN ELECTRON for sale, £100 ono. or will swap for 48K Spectrum. Also Electron softwre for sale. Tel: 0233-27457 after 6pm.
BBC SOFTWARE for sale! Bargains! All tape originals big names: Acornsoft, Micro Power etc, £5-8 each. Also some Books. Please phone (01) 722 8745 soon! After 6pm. Any hints on Castle Quest appreciated.
BBC B plus recorder, lots of software, all Acorn users and micro users to date. Eproms etc. Exchange for CBM64 and disc or sell for £350 ono. Tel: Ilfracombe 66032 evenings, weekends.
ACORN ELECTRON, boxed as new, including Felix and the Fruit Monsters and copies of Electron user mag, £80. Smith, Two Magpies, Lincoln Road, Fenton, Lincs. Tel: Torksey 355.
BBC-B 800K drives, Microvitec 635, joysticks, Worldwise, Pascal, Watford DFS, Viglen cartridge system, speech, sidewise board, books, 40+ discs and more. £799. All in mint condition. Shaun. Tel: Hatfield 61834.
BBC-B + £600 SOFTWARE and cassette recorder + joysticks. I/F £450 ono. Tel: 0491 39562.
BRAND NEW ELECTRON GAMES. Not used, £110 ono. Tel: 0603 712009.
BBC ORIGINAL S/W INC: Ceaser Cat, Eddy Kidd, 3D Grand Prix, Swag, Micro Olympics, Manic Miner, Jet Pack and many more. £2-3 each. Tel 05827 69152.
BBC HARDWARE, Double Density, £30. Acorn 1.2 DNFS, £85. Word Wise, Disc Doctor and Graphics Rom (still wrapped) £25 each. Tel 05827 69152.
BBC-B ACORN DATA RECORDER, Acorn joysticks, Arcade style joystick and interface plus £190 worth original software, cost £670, any reasonable offers (or swap for CBM 64). Tel: 0742 393625.
BBC MODEL B 051.2 Basic 2 cassette recorder, leads, software, computer concepts graphics Rom, dust cover, magazines, VGC. One year old. £325 ono. Tel St Albans (0727) 55936 weekdays after 4pm.
BBC-B (051.2), recommended cassette recorder, joystick interface, slik-stik joystick, communications Rom (Commstar) and much software inc Elite, Frak! Fortress value, £700. Offers around £400 only! Tel: 0405 814412 (nr Doncaster).

Ataris for Sale

ATARI CASSETTES. Galactic Chase, £7; Action Quest, £8; Ghost Hunter, £8; Temple of Apshai, £18; Airstrike, £5; Preppie, £7; Shamos, £7; Ptotector, £7. Tel: 05436 72055.
ATARI 600XL, games, cassette recorder, joystick, £70. Tel: 01-837 7763 after 5pm.
ATARI VCS, includes one joystick and missile command, ET, MS-Pacman, Combat, Haunted House, Defender and Adventure, around 1½ years old. Excellent condition. £47. Tel: (041) 632 0592 after 5.30pm.
ATARI 400, 800 Zaxxon for sale. (On disc.) Offers welcome. Sam. Tel: 01-368 3784.
ATARI 810 disc drive, complete with DOS. Can be used with all atari computers. Speeds up loading and offer access to more software, price £100. Tel: 031-441 6441 after 6pm.
ATARI 800XL. Four months old. With Quickshot joystick and Encounter for £50 ono. Tel 01-858 2794 after 6pm.
ATARI 1010 CASSETTE RECORDER, brand new, boxed. Defender cartridge, £20. Tel: Cardiff 491560 after 6pm.

Commodores for Sale

COMMODORE 64, cassette unit, over 100 games, 2 joysticks, manuals + magazines, £260. Tel: Slough 23062.
VIC 20 + 16K switchcable (brand new) + joystick + loads of software inc. Perils, Willy, Chariot Race, Mega-vault, Skyhawk, cartridges + 5 books all boxed C2N not included. Offers around £130. Hornchurch 45284.
CBM 64 software: Seawolf, J/Lander, Lazarian, Ceaser/c, Kong, M/Buggy, Hustler, Kickoff, Forbidden/f, Mr Wimpy, Hunchback, Aquaplane, D/Diamonds, C/Balloon, Gridtrap, S/Pipeline, Attack/mc, Revenge/mc, H/Bovver, Siren/c, M/Dick, 3 Mastertronic £25 the lot. Phone: 01-593 6579.
VIC 20 + cassette recorder + starter pack + 16K Ram expansion + £65 of the latest titles e.g. Pharoes Curse, Golf etc. All in v.good condition and sell for bargain price of £80!! Tel: 01-889 5646.
SALE CBM 64 s/w Hobbit, Grandmaster, Forbidden Forest, Cyclon, Manic Miner (D), J-Jack, Disco, Rapid-Backup-System, Backup-deluxe etc. Also T199/4 s/w starter I&II less ½ price. Ring (0865) 54084.
COMMODORE 64 6 months old. Hardly used and still under guarantee with data recorder and Quickshot II joystick for £180. 041 772 1862.
COMMODORE VIC 20 + cassette + £100 games + lots of books, good condition £130 ono. Tel: Houghton le Spring 841676 after 6pm.
VIC 20 software Bewitched, Arcadia, Catch Snatch, Tornado, Cavern, Fighter Space, Swarm, Mini Kong all originals £2. Farnworth 75103 after 4pm.
COMMODORE 64 originals sell for Adventures, Staff Karnath, Forbidden Forest £3.75 each, Forest of Doom £2.95, Boogaboo, Arabian Nights, Cavelon, Hunchback, Chinese Juggler, Burgertime, Dungeons £1.95. 0703 420016.
VIC 20, cassette unit, 16K games + mags etc. offers please. Tel: Waltham Cross 39223.

3K VIC 20, starter pack, super charge plus cartridge, Vickit 4 cartridge, s/w, book. Cost £180, highest offer accepted. Tel: 061 428 4820.

VIC 20 C2N cassette deck, lots of software, four books. Intro to Basic Part 1 £80 ono. Telephone Carterton 841496.

VIC 20, cassette deck, 16K Ram pack £150 of s/w. Programs and cartridge, light pen, joystick + extension, mother board, mags. £400 sell £230. Tel: 01-594 5965.

Dragon

DRAGON 32/64 software for sale. 26 cassettes worth £210. Will sell for £80. Part deals considered. All guaranteed originals. Phone: (04024) 71403 anytime and ask for Reece.

DRAGON software for sale. Many titles on offer. More details tel:01-363 4523 (eves) ask for Andrew. But Hurry. Original only.

DRAGON 32 + joysticks, tape recorder, 24 pieces of software and many magazines worth £350 only £300. Tel: 028 487652.

DRAGON 32 original software. Knife Kishtu, Pettigrews Diary, Inspector Clueseau, Volcanic Dungeon, Treasure Tombe, Quest, Active Games Tape, Dragopoly, Graphic Animator £10-50 ono. The lot. Pair joysticks £4. Phone 0703 420016.

DRAGON 32 and Seikosha GP100A printer with connecting lead. Includes joystick and several games (originals). £200 ono. Telephone 0491 35849 (Oxfordshire).

DRAGON 32, cassette recorder, joysticks £170 worth of software, books, magazines. All for £100. Call Damian on 01-878 4033 after 5pm.

DRAGON 32, cassette recorder and joystick. Over 100 original games – American titles. £150 ono. Tel: (0633) 400 858.

DRAGON CHAMPIONS for sale. Original and hardly used, still with instructions, worth £6, sell for £3. Tel: 0480 683788 after 4.30pm on weekdays.

DRAGON 32, boxed + joystick + light pen + cassette recorder + original software, worth £140 (Kong, Defender, Chess, etc) + 4 programming books + over 80 magazine back-issues. Bargain at £120 ono. Tel: (021) 426 4888.

DRAGON 32 Datacorder, joysticks, all leads, lots of software books, magazines, as new, all boxed £100. Tel: Sedgley (09073) 53377.

DRAGON 32. 15 original games + joystick, boxed as new, £85. Tel: 01-658 1700.

For Sale

OK1 microdrive 82A matrix printer, single sheet and pin feed, 160 CPS. Variety of character sizes. 9 Languages RS232 and centronics interface. Excellent conditions £160. Tel: 0525 220980

AMSTRAD SOFTWARE and books, sell at 40% original Snooker, Blagger, Hunchback etc. Also a few BBC Educational Books and Software Cheap to clear. Tel: 0255 8145523.

FOR SALE Knightlore £5, Hampstead £5, Jasper £3.50, Jetset Willy £3, Blue Thunder, Rapscallion, Sliker Puzzle £2 each. Wanted new generation's complete m/code tutor. M Russell, 10 Gwastod Terrace, Cwmtillery, Gwent.

TI99/4A little used extended basic mini memory assembler editor manual parssec cassette lead, books, technical data. £150 no splitting. Tel. 0240 74899 (Chalfont St. Giles).

96K LYNX and disc drive. Also printer interface and programs including software project's "Jetset Willy" £250 ono. (no split). Tel: David 0524 415436 evenings. Swap for CBM 64 plus extras.

QL-QUILL, Easel, Abacus, Archive. Latest updated 100% machine code versions. All unused original PSION software, plus relevant documentation £6 each or £20 for all four. Tel: Kings Langley 66780.

JUPITER ACE with all leads, 16k manual sell £25 or swap for 16k ZX81 with leads and manual, wanted any Jeff Minter games reasonable prices offered. Michael Croft, 33 Kirkes Rd, Moorlands, Lancaster, Lancs.

CLOSSAL ADVENTURE £5 Disco £7 Datel interface for any recorder on Commodore 64 £7 Ten Little Indians £5 all original. Sold my 64. Tel: Ferndale (0443) 730438 after 6pm.

FOR SALE Amstrad computer with TV adapter, joystick and tapes (no monitor) only £160 ono all under guarantee. Tel: D. Scott f(0450) 78666 ex12 (daytime).

PRINTER FOR SALE Seikosha GP250X plus Paper, Screen, Dump, Dust Cover and Centronic interface to connect to BBC. Immaculate condition £180 ono. Tel: Shrewsbury (0743) 56341.

TEXAS TI99-4A computer with manual. A much under rated computer which accepts a large range of plug in modules along with usual cassette input.Tel: Washington 4163010.

100's MAGS for sale. Very cheap must go quickly. Tel: 051-733 0090 after 4pm.

CHEETAH 68 FX1 Spectrum keyboard £30. Full travel numeric keypad. Tel: 01-951 0007 after 7pm.

STONECHIP Programmable Joystick Interface for Spectrum. Boxed as new £15. Tel: 061-980 7086.

ORIC ATMOS 48k, offers. Tel: Wellington 4109 ask for Brett.

MSC S/W cassettes. Original Only. Blagger + Punchy £7-£6. Tel: Aylesbury 748300.

FOR SALE Interface 1, 1 Microdrive and 5 cartridges £65. 5 Rolls Sinclair Paper £5. **SPECTRUM SOFTWARE.** Games designer £8. Dungeon Builder £5. Mugsy £3. Alchemist. zzoom, Jetman, Hunchback £2.50 each. Hulk (BBC B) £4. Tel: Llanelli 772132.

SPECTRAVIDEO SV328 Joysticks, Data cassette, Games/Utility software, Expansion box with Centronics RS232, Floppy disc interface, 64k RAM cartridge, £350 ono. Tel: 0252 544179 evenings and weekends.

CURRAH MICRO Speech £15 ZX printer £15 Kempston Joystick and interface £18 computer tape recorder £12 sound amplifier £5 plus software and mags everything in mint condition. Tel: 0704 20298.

FOR SALE Sinclair expansion system (interface one + microdrive) and tape to microdrive utility tape, £70 ono. Tel: Tyneside (091) 2852003.

AMSTRAD Extravaganza, for the solution to unprotect list, amend and re-save the Welcome tape and other software, send SAE plus £1 to Simon Waryard, Hartland House, Ballsdown, Chiddington, Surrey GU8 4XJ.

CHEETAH KEYBOARD for ZX Spectrum, unwanted gift as new £20. Tel: Asford (Middx) 45523 after 6 pm. Quick sale needed.

FOR SALE Box of 8" discs. Box unopened Highest price secures. Also for sale Reset Switch for CBM 64 £2.50. Wanted CBM 64 Printer £50 Tel: Robert on Northampton 402750.

SORD M5 computer + data recorder and games £85 ono. Also 16k ZX81 £35 and for 16k Vic20 mathematics 1 and 2 unused £10 for both or £5 each. Tel: Tamworth 873065.

FOR SALE Prism VTX 5000 £50 ono. Tel: David 038578327.

OVER £250 worth of recent original Commodore 64 software. Everything from Spy Hunter, Impossible Mission and Ghost Busters, to the Quill and Games Creator. Swap for a Commodore Disc Drive. Tel: 01-997 8724.

AMSTRAD SOFTWARE Forest at Worlds End, Oh Mummy, Erbert, Harrier Attack and Flight Path 737 all as new £3.50 each. Tel: 0630 57129.

ARIES B20 20k expansion board for BBC, £60. Acernsoft Elite, cassette version £10, 10 single sided single density Memorex discs £12. Write: Mark Middleton, 131 Cannon Hill Road, Coventry.

TORCH Z-80 disc pack for BBC-B for sale. Twin (Mitsubishi) drives-800k Z-80 CPM board, perfect software, manuals, all for £475 ono. Tel: 01-373 6354.

TI994/A MODULES Pirate/Adventure, Alien addition, Minus Mission, Addition/Subtraction one. Also Console and Peripheral Expansion box Technical data. £20. Tel: 0524 53648.

CGP115 graphic colour printer ideal printer for Spectrum Plus int.1 plus lead £110. Write to B Clark, 30 Mayne Crest, Springfield, Chelmsford, Essex.

SHARP MZ-80A comes complete with monitor and cassette unit. Only five months old. Cost £500 new sell for £230. Telephone Damon on 04023 44313 evenings.

MEMOTECH MTX 512 plus software. Perfect condition complete with all leads and manual. Cost #315 new sell for £200. Phone Damon on 04023 44313 after 6pm.

FOR SALE Rainbow Electronics programmable joystick/sound booster £20 or swap for Fuller Box. Tel: Lea Valley (9) 761474.

CASIO FA1 and FA2, will interface 502P/602P and 702P to tape recorder. Giveawawy price £5 each or £8 for both. 01-527 5493.

PB700 pocket computer 48K unused complete with Built-in screen, manuals, case, basic. Costs £120 in Japan: (only just available in UK, £200+ for this full memory model) £120 ono. 01-527 5493.

FOR SALE three programming and games books for Amstrad, Oric 1 and Dragon or will swap for anything on Atmos 48K offers. Telephone Leeds (0532) 406201.

ORIC software Harrier Attack, Golf, Galaxians, Ancherons Rage, books two programs one hand. Lead computer to tape all in very good condition £20 ono. Canvey 0268 682953.

AMSTRAD software for sale: Roland in the Caves, Harrier Attack, Football Manager, Colassal Adventure, Wapton Village Race. £4 each. Phone 0422 75386.

ORBIS Publishing "Home Computer Course" 24 parts plus two binders. New condition only £10 including £2 postage. Phone 0226 282645.

AMSTRAD CPC464 (green) perfect condition under guarantee, plus joystick and software £190. S. Weeks, 26 Eastern Avenue, Croeserw, Cymer, Port Talbot, West Glamorgan SA13 3PB.

CAMBRIDGE programmable joystick interface £15. Skooldaze, Night Gunner, Match Point, Survival, Make a Chip, £3.50 each. Spectrum 16/48 cassette magazine issues one to eight £10 the lot. Telephone Sheffield 460910.

Spectrums for Sale

Spectrum Chatterbox Speech Synthesizer £9, Kempston joystick interface £4 also much Spectrum software available £10. The lot or will split SAE: Matthew Norman, 50 Bloxcidge Street, Oldbury, W.Mids. B68 8QH.

Spectrum 48K interfaces one and two, Microdrive, tape recorder, Lo-profile keyboard, joystick, RS232 lead, composite video interface, 44 original programs (worth £390). Original value £780. £420 o.n.o. Tel: (0256) 881701.

48K Spectrum Microdrive with cartridges, DK'Tronics keyboard, Fox programmable joystick interface, TAC2 joystick, cassette player, software and books. All in excellent condition, £200. Tel: Nuneaton 0203 346848 after 6pm.

48K Spectrum ZX printer with 10 rolls of paper. Programmable joystick interface. Over 200 games, mags £190 o.n.o. Tel: 061-980 7086.

Spectrum IDC edge connector mounted on 6" of flat ribbon cable. One only, brand new £5. Phil Wade, Morgan Hall, The Lawns, Cottingham, N. Humberside. Tel: (0482) 849614.

For Sale Spectrum software, books + Currah Micro Speech. Cheap prices, send SAE for full list (all originals), A McKerrell, 22 Millar St., New Elgin, Elgin Moray, Scotland.

Spectrum 48K Stack Light Rifle, Electronic Rifle + games used once £24 sale due to computer change. Tel: 01-502 2681 after 7pm.

Spectrum software for sale. Snowman, Circus £4 each. 3-D Tank Duel, Dictator, Go to Jail, Gangsters, Paris Trip £3 each. Tel: 0492-49722.

Spectrum 48K in real keyboard with interface I, two microdrives, Light pen, Digital Tracer, Microspeech. Fully working with tonnes of software £200. Phone 01-399 5492 after 6pm ask for Mark.

48K Spectrum DK keyboard, ZX printer + 6 rolls of paper, software incl Sherlock, Valhalla, Machine Code Books. £120 Tel: 0782 47766.

Spectrum keyboard (SAGA) + dustcover and 56 way extension cable. Give your Spectrum that professional feel cost about £70 new, only £40 compatable with all peripherals. Phone Bookham (0372) 56327.

ZX Spectrum issue three 8 months old exel. cond. still in box. Software, joystick interface + tape deck. Worth over £300 will take £165 ono. Phone Slough 33962 evenings.

48zk Interface I, 2 microdrives, 10 cartridges, Interface II with Q-Shot I & II j/s Alphacom 32 printer, fuller keyboard + lots of s/w, costs £500 accept £275ono will split. Tel: 0590 23733.

48K Spectrum interface I microdrive + 40 cartridges s/w leads + manuals £250. 48K Spectrum low profile keyboard £175 will seperate. Tel: 01-572 2917.

48K Spectrum £70. Interface II £15. S/w, Gift From the Gods, Raid Over Moscow, American Football, World Cup, Match Point. Ring Medway 32690 after 4pm.

Spectrum 48K programmable joystick interface + Q-Shot joystick £500 of original s/w incl Miss Pacman, Technician Ted, Brain Blood Axe £150 quick sale Paul 01-950 7430.

SPECTRUM 48k, DK Tronics Keyboard programmable joystick, s/w/ worth over £200. Titles include Match Day, Sabre Walk etc. Will sell for £140 ono. Tel: 0420 84774 (after 6pm).

SPECTRUM s/w, 24 titles inc: Manic Miner, JSW Lost, £148. Sell £70 ono.Tel: 0773 49217 (after 4pm) + issues of Crash to Sell.

48k SPECTRUM, low profile keyboard. Interface I, Micro-drive, 7 inch b/w monitor BTX 5000 Modern Kempstor joystick + Centronics Interface. S/W, Mags, Books £140 ono. Tel: South Okendon (0708) 857010.

48k SPECTRUM with manual + s/w £60 also Casio PT50 electronic keyboard, worth £100 sell £65. Tel: 0942 816523, Howard.

SPECTRUM ORIGINAL s/w between £3-£8 Top Titles. Tel: 01-550 8332 after 7 pm.

SPECTRUM 48k good condition, 15 original games, 40 C15 tapes, Sanyo tape recorder, plugs, leads, manual, good starter pack £160 or will swap for CBM 64 + recorder. Tel: Basingstoke (0256) 47-7327.

SPECTRUM SOFTWARE: Steve Davis Snooker, Plummet, Ghostbusters, Alien 8, Stagecoach, Sherlock, Zombie Zombie, Braxx Bluff, Beach Head, Airwolf, all quite cheap. Tel: 0532 620206 evenings ask for Paul.

SPECTRUM OWNERS! Newsletter Club gives detailed reviews of Spectrum Software, Competition plus Contact Sheet. Annual Membership £5 (UK). £8 Europe. Contact A.J. Carter, 19 Burn Lane, Newton Aycliffe, Co Durham.

SPECTRUM SOFTWARE Deathstar, Bugaboo, Skull, Lunar, Jetman, Hunchback, royal Birkdale, Johnny Reb, Chess, Ship of Doom, Horace and the Spiders. Worth over £50 will sell for £22 or £2.50 each. Jonathan Sayers, 8 Upper East Street, Sudbury, Suffolk. Tel: Sudbury 75289.

SPECTRUM 48k cassette recorder, Currah Microspeech, Quickshot II Joystick, Switchable Joystick Interface £50 worth of software, 5 months old. Excellent condition. £100. Tel: Cardiff (0222) 616351 Buyer collects.

SPECTRUM 48k Vu-File program on cassette £3.50 ono. Mr Bradley, 8 Springfield Road, Caversfield, Bicester, Oxford OX6 9TT.

SPECTRUM 48k, boxed and in excellent condition. Also software and books. Cost over £230. Will accept £110. Buyer collects or pays postage. Tel: Market Deeping 345361 after 4 pm.

SPECTRUM 48k system. Keyboard, Speech, Sound, FJoystick, Interface 1 and Microdrive, 16 cartridges and over 80 cassettes; serious and games. Worth £600, sell for £270. Tel: Middlesbrough 460286 after 6 pm.

ZX SPECTRUM 48k (6 months old) £85. Tape Recorder (6 months) £15. Tel: (0862) 801546.

SPECTRUM Software all £3 each Tobor Pssst, Escape Orbiter, Sentinel, Avenger Kong, Zoom Zoom, Hunchy Mined Out, Zadom Robon, 45 more. Tel: Newcastle 761396 call Phil after 4.30 pm.

SPECTRUM 48k in VGC £70. One £116 of s/w inc. 16 top games £50. Kempston Interface + Quickshot II Joystick, Case 25 all £125. Tel: 01-361 0269.

SPECTRUM F48k + over £300 worth of original s/w, Currah Speech, Printer + Paper, Kempster Interface, Quickshot II, Tape Recorder. All boxed in very good condition £250. Tel: 01-624 6214.

SPECTRUM + 48k VGC. £300 of s/w. Original Interface I Miocrodrive + Joystick. Quick Sale £170. No Hagglers. Tel: 01-859 5498.

SPECTRUM 16k plus £35 of software worth £105 for £50 of near offer. Please Tel: James on 01-203 1577.

NEW SPECTRUM + for sale £115 of swap/part ex for Commodore 64 or Amstrad CPC 64. Tel: Heckmond Wike 407459.

SPECTRUM 48k with over £110 worth of software. All originals. Will separate everything for £130 ono. Tel: Isle of Wight 296472.

BARGAIN 48k Spectrum + £200 of software + joystick Interface. All in excellent as new condition. Only £100 the lot. Tel: Horley 771876 after 5pm Weekdays, anytime Weekends.

BARGAIN SPECTRUM 48k, Interface I, Microdrive, ZX Printer, Quickshot II, with more than 100 top software, games/utilities plus extras. First £200 takes it all away! Tel: 01-743 4150.

SPECTRUM KEMPSTON joystick interface and Joystick £20 ono. DK Tronics programmable Joystick, Interface Brand New 18! Sabrewolf £5, Decathlon £4, Manic-Miner £3, Chequered Flag £3, Zzoom £2, Ant-Attack £2.50 Tranz-Am £2.50. David McNiven, 53 Lackford Close, Brundall, Norwich, Norfolk, NR1 35NL. Tel: (0603) 715689 after 5pm.

SPECTRUM GAMES unused. For e.g. Doomdark Revenge £6.95, Scrabble £6.95. VU-File £5 and almost any one you want unused and cheap. 2× printer paper. Tel: Radlett 2673 after 3pm.

SPECTRUM SOFTWARE 15 titles including Knight Lore, Alien 8, Starstrike, Fall Guy, Brian Bloodaxe, etc. £35 the lot. Tel: 061-652 3778 after 5pm.

Tandys for Sale

AQUARIUS COMPUTER + 4 Games + 16tc expansion. Also 3 marvals £60. Tel: 01-304 4618

APPLE II plus complete 2 disc drives, monitor cables, lots of s/w marvels, games, joystick + paddles, various accessories, offers. Tel: 01-881 2525 Dave (eves).

AQUARIUS COMPUTER Inc data recorder = s/w, books worth £120. Sell £80. Tel: Bolton 29628.

TRS 80 software. Various cassettes, offers? Tel: 09544733.

TANDY TR%S-80 Colour computer and Bush computer data recorder. Boxed as new with leads, manyuals etc. Bargain Price? only £75! Tel: (0244) 675717.

TEXAS TI99/4A Joysticks, connect four cartridge, basic tutor immaculate condition £50 ono write to: Clive Newton, 90 Pentre Close, Cwmbran, Gwent, NP44 7LR. Tel: 06333 60547.

TANDY CGP-115 colour printer-plotter 6 months old, spare pens, papaer. Boxed, as new £90 Tel: (0475) 86189 after 5.30pm.

APPLE II + 48k, two disc drives. 80col card, printer drier, mono monitor, all manuals, some books and discs. £750 Tel: Steve, Portsmouth (0705) 592503 during office hours.

TANDY CGP-115 complete with spare pens and paper (worth £10) and Dragon interface, takes cinkronics or serial FHS Moss computers sell for £100 or interface £20. Tel: Great Sampford 226

TANDY TRS-80 model I + keyboard, 48k expansion interface. Green Screen monitor 2 × 40 track floppy drives. Live printer 7 s/w £400. Tel: 01-385 1299, ex159

TANDY COLOUR GAMES £4.50 each. Various Cuthbert, Worm Tube, Scrabble + others. Tel: 01-609 6930.

APPLE II 48k, Quickshot disc drive + controller, exhelent condition 14" Colour Monitor. S/W £500 ono. Tel: 0932 228720.

TANDY TRS-80 Chess cartridge for colour computer. Plays a good game! Will post if required or can be seen working. Accept £9.50 ono. Tel: (0244) 675717.

Wanted

SPECTRUM CENTRONICS Interface wanted. Hire for a day or two. Must be able to list. Tel: 01-675 2634 (will collect South London Area).

WANTED Printer (Shinwa or Similar) Wanted Mico-drive. Wanted Books. Zak's dissembler. Up to 2/3 new price according to condition. Frank Roberts, 4 Signals Group, BFPO 23. Tel: (01)049 5141 36977.

WANTED Music Maker by Super Soft. Tel: 061-799 0408.

SWAP ROTEL RVC 230. 40 channel CB Rig PSU. Powerful Home Base Antenna Echo Power Mike. SWE Meter for 48k Spectrum. Can deliver/collect. Tel: 01-968 7556.

COMMODORE 64 'O' level cassettes for sale (offers)? or swap for absolutely any games I haven't got. Biology and Mathamatics II. Swap Psychedelia for both. Dave, 45 Stonerwood Avenue, Hall Green, Birmingham, B28 0AX. Tel: 021-777 5023.

SWAP MULTI MODE CB Radio S-Lo Lo Mid Hi for 48k Spectrum plus software or best offer send details, rig has all SSB. Swap TV Radio Cass for Spectrum 48K. TV 6 months old Sony FX412UK. Send for details. M Jordan, 16 Soutergate Barton, South Humberside, DN18 5HG.

SWAP IMPERIAL TYPEWRITER "Duplicator" £100 Worth Stationary for Duplicator. Sharp PC1311 still boxed the lot for Vic20 Printer. Such as 1525 SAE. Elvin 214 Hornington Rd. Firth Park, Sheffield S5 6SG.

WANTED Sinclair QL have CBM 64 disc drive MPS 801 printer speech synthesiser, joystick, books, games etc. to deal with. Tel: Chorley 68007.

SWAP 00 GUAGE Model Railway Engines, Coaches, Wagons, Display Cabinets, Books, Equipment, Etc, for Amstrad CPC 464 and Colour monitor. Tel: Bill on 01-524 4731 for appointment to view.

FRENCH ELECTRON OWNER wanted and English pen friend who has an Electron or a BBC. Tel: 20 98 19 06 France. Dovergne Oliver.

SPACE SHUTTLE by Activision Wanted. Send asking price to: Andrew, 1 Heol-Y-Graig, Crynant, Neath, SA10 8TF. Other good simulations also considered, all wanted for Spectrum not CBM 64.

ZX81s for Sale

ZX81 16K ram pack £10. Gordon, Tel: 0222 751550.

ZX81 16K ram pack graphics rom and vdg. Some Software £45 the lot. Tel: Lowestoft 731932.

ZX81 16k + keyboard + RS232 + Speech + Sound + INV Vidio + £80 worth of books + software. The lot £110. Tel: Mark Gregory 021-526 2417

SINCLAIR ZX81 1k with manual adaptor and all leads excellent condition £10. Tel: Rhyl (0745) 53116.

ZX81 Software for sale, 12 titles inc. Flight Simulation, Space RAiders, Catacombs, Defenda, Vu-Calc £12 for all 12. Tel: 0236 29808 (David).

ZX81 16K in professional keyboard, books, games, power pack + leads inc.

THE FUZION OF MIND AND MACHINE

CONFUZION

ADVENTURE HELPLINE

Sherlock on Spectrum. I can't enter either Tricia's or Bazil's London houses. How do I stop Ffoulkes being killed after he has confessed his opium addiction? Gareth Miles, 73 Cotefield Drive, Leighton Buzzard, Beds (0525-373880).

Spiderman on Spectrum. How do I get past the fan and get my web fluid. Antony Bimpson, 20 Cornwall Drive, Hindley, nr Wigan.

Return to Eden on Amstrad. How do I stop the parrot stealing objects? David Robinson, 17 Tatham Way, Oakwood, Leeds LS8 2PR.

Sherlock Holmes on Spectrum. I lose Basil Phipps and the German agent in Victoria Station. Where do they go? James McKay, 14 Murray Place, Perth, Scotland.

Sherlock Holmes on Spectrum. Once I get to the front door of Sherlock's house and hail a cab I can't go anywhere. Scott Wilkinson, Orchard House, London Road, Billericay, Essex.

Witch's Cauldron on Spectrum. How do you change from a cat? What do you do with the cauldrom? Ian Burgess, 60 Alpraham Cresent, Upton, Chester.

Fantasia Diamond on Amstrad. What is the point of going down the manhole? How do you cross the river? What can the gnome and the wise old man do for you? Teresa Hewitt, Drakes Farm, Noverton Lane, Prestbury, Cheltenham, Glos.

System 15000 on Commodore 64. How do I get past the auto-ID in Selcra Securities? It tells me 'This system for 1500 users only'. Peter Dent, 11 Salvordale Street West, Seaham, Co Durham.

Eric the Viking on Spectrum. How do I scare the eagle? How do I enter the church? What are bear sinews? John Mellor, Briar Cottage, Top 'o the Hill, Thurstonland, Hudds.

Lords of Time on Commodore 64. I cannot find the the sword to kill the black knight. James Stevenson, 102 Beckwood, Catterick, Garrison.

COMPUTER SWAP COMPUTER SWAP

Computer Swap entries are limited to 30 words. Either fill in the accompanying form and send to Computer Swap. *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD or telephone 01-437 4343.

All software offered through computer swap must be in original condition and for private sale only.

It cannot be swapped.
Warning: It is illegal to advertise pirated software.

Please write your copy in capital letters on the lines below.

Name .....

Address .....

.....

Telephone .....

Top 10

Vic 20

1	(-)	Mastertronic Triple Pack	(Mastertronic)
2	(4)	Doodlebug	(Mastertronic)
3	(1)	Wizard and Princess	(Mel. House)
4	(3)	Perils of Willy	(Software Projects)
5	(7)	Flight 015	(Craig Comm)
6	(6)	Psycho Shopper	(Mastertronic)
7	(—)	Space Scramble	(Mastertronic)
8	(—)	Sub Hunt	(Mastertronic)
9	(10)	Duck Shoot	(Mastertronic)
10	(—)	Sub Commander	(Thorn/Emi)

(Compiled by Websters Software)

Commodore 64

1	(8)	Airwolf	(Elite)
2	(—)	Mastertronic Triple Pack	(Mastertronic)
3	(3)	Chiller	(Mastertronic)
4	(2)	BMX Racers	(Mastertronic)
5	(4)	Booty	(Firebird)
6	(—)	Baseball	(Imagine)
7	(—)	Tir Na Nog	(Gargoyle)
8	(—)	Ghostbusters	(Activision)
9	(—)	1985	(Mastertronic)
10	(—)	Big Mac, Mad Man	Maintenance (Mastertronic)

(Compiled by Websters Software)

Spectrum

1	(2)	Booty	(Firebird)
2	(—)	Mastertronic Triple Pack	(Mastertronic)
3	(—)	Baseball	(Imagine)
4	(—)	Airwolf	(Elite)
5	(7)	Everyone's a Wally	(Microgen)
6	(10)	Finders Keepers	(Mastertronic)
7	(3)	Raid over Moscow	(US Gold)
8	(—)	Dragon Tord	(Hewson)
9	(—)	Chiller	(Mastertronic)
10	(6)	Skool Daze	(Microsphere)

(Compiled by Websters Software)

BBC B

1	(—)	Snooker	(Visions)
2	(—)	Castle Quest	(Micropower)
3	(—)	Acid Drops	(Firebird)
4	(—)	Bird Strike	(Firebird)
5	(7)	Scrabble	(Leisure Genius)
6	(4)	Mr 'EE	(Micropower)
7	(—)	Star Maze	(Mastertronic)
8	(—)	Spectipede	(Mastertronic)
9	(1)	Football Manager	(Addictive)
10	(—)	747 Simulator	(Doctorsoft)

(Compiled by Websters Software)

Atari

1	(1)	Smash Hits Vol. 1	(English Soft)
2	(2)	Attack of Mutant Camels	(Llamasoft)
3	(3)	F15/Strike Eagle	(Centresoft)
4	(7)	Colossus Chess	(English)
5	(5)	Sub Commander	(Thorn EMI)
6	(4)	Computer War	(Atari)
7	(6)	Encounter	(Hi-Tech)
8	(—)	O'Reilly's Mine	(Centresoft)
9	(—)	Krazy Koptor	(English)
10	(—)	Miss Pacman	(Atari)

(Compiled by Websters Software)

C.16

1	(5)	Wizard & the Princess	(Mel. House)
2	(4)	Vegas Jackpot	(Melbourne House)
3	(1)	Roller Kong	(Melbourne House)
4	(—)	Xargon Wars	(Gremlin)
5	(7)	Games Tape 1	(Melbourne House)
6	(2)	Games Tape 2	(Melbourne House)
7	(8)	Berks	(CRS)
8	(9)	Flight 015	(Craig Communications)
9	(10)	Williamsburg Adv.	(Microdeal)
10	(4)	Stellar War/Blitz	(CBM)

(Compiled by Websters Software)

Amstrad

1	(3)	Ghostbusters	(Activision)
2	(5)	Jet Set Willy	(Software Projects)
3	(—)	Millionaire	(Incentive)
4	(2)	World Cup	(Artic)
5	(4)	Fighter Pilot	(Digital Intervation)
6	(7)	Flight Path 737	(Anirog)
7	(8)	Jewels of Babylon	(Inter. Micro)
8	(6)	Snooker (Steve Davis)	(CDS)
9	(—)	Dark Star	(Design)
10	(—)	Football Manager	(Addictive)

(Compiled by Websters Software)

Diary

Event	Dates	Venue	Admission	Organisers
Apple 85	May 9-10 10.00am-6.00pm May 11 10.00am-4.00pm	Novotel London W6	Free in advance from organisers	Database Publications 061-456 8383
Electron & BBC Micro User Show	May 9-11 10.00am-6.00pm May 12 10.00am-4.00pm	New Horticultural Halls London SW1	£3.00 adults £2.00 children	Database Publications 061-456 8383
6th Commodore Computer Show	June 7-8 10.00am – 6.00pm June 9 10.00am – 5.00pm	Novotel London W8	£2.00 adults £1.50 children	D + CS Marketing Ltd 01-630 6165

Readers' Chart No 21

1	(3)	Alien 8 *(Spectrum)*	**Ultimate**
2	(2)	Knight Lore *(Spectrum)*	**Ultimate**
3	(1)	Soft Aid *(Spectrum/C64)*	**Various Artists**
4	(5)	Everyone's a Walley *(Spectrum/C64)*	**Mikro-Gen**
5	(–)	Bruce Lee *(Spectrum/C64)*	**US Gold/Datasoft**
6	(–)	Ghostbusters *(Spectrum/C64)*	**Activision**
7 =	(4)	Sorcery *(C64/Amstrad)*	**Virgin**
=	(–)	Technician Ted *(Spectrum)*	**Hewson**
9	(8)	Impossible Mission *(C64)*	**CBS/Epyx**
10	(–)	Tir Na Nog *(Spectrum/C64)*	**Gargoyle**

Winning phrase No 21: "Lost shirt on sure thing" from Paul Murton, Town End Farm, Sunderland who receives £25. Others who came close were "Elton's bath sinks hotel" from Lee Russell of London, "The grass is green, the Hulk too" from Mark Sarul of Leicester, "Gross thugs like Leon Brittan" from Neil Bond of Cardiff, "Sh! 8 ghouls listening to tree bark" from Bob Turner of Manchester and "one ober the 8, hik!" from David Blackedge of Bolton.

Now voting on week 23 – £25 to win

Each week *Popular* is compiling its own special software top ten chart – compiled by YOU.

And each week we will send £25 to the person who sends in, with their chart votes, the most original (witty, neat or clever – but never rude) phrase or sentence made up from the letters (you don't have to use them all) in the titles of the top three programs in this week's chart, published above.

You can still vote in the chart without making up a slogan – but you won't be in with a chance of winning the prize.

All you have to do is fill in the form below (or copy it out if you don't want to damage your magazine) and send it off to: Top 10, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP.

Voting for Week 23 closes at 2pm on Wednesday May 1 1985. Entries received after that time will not be eligible for inclusion in that week's voting. The judges decision is final. Only one entry per individual per week will be allowed.

Name .....

Address .....

.....

.....

My top 3: Voting Week 23

1.....

2.....

3.....

My phrase is: .....

New Releases

GOTHIC SCRIPT

Tower of Despair was one of the best Quilled adventures of last year. Its sequel in now available, although *Key of Hope* can be played as an independent (and vast) graphic adventure in its own right.

Key of Hope continues the tale of the way between The White Goddess of Truth (she's not a baddie) and Malnor the Demon Lord (he definitely is). You have been summoned through time to help Mrs White and have to adopt an unfamiliar body and travel through an unfamiliar world seeking the parts of the Key of Hope – fail and terrible awfulness falls upon the world, just like continuous Sundays in Rhyl.

The adventure is Quilled again and features graphics which, though simple, are quite effective – they add to the atmosphere as do a series of redefined text characters where first letters are illuminated and the rest of the script looks gothic, as does your input. These elements, though not fundamental, contribute much to the feel of the game.

Being Quilled, the text analysis is only so-so, but so far I've found the game compelling. Ie, I can just about solve some of the problems, but others have me baffled. Maybe others will find it too easy but it's vast enough to keep anybody occupied for months.

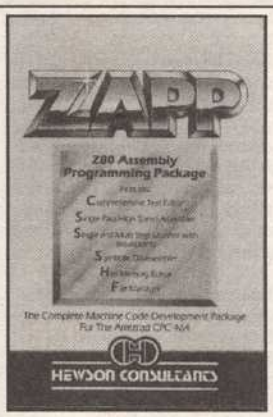
Program *Key of Hope*
Price *£7.95*
Micro *Spectrum*
Supplier *Games Workshop*
27/29 Sunbeam Road
London NW10 6JP

HELPFUL

Zapp is a fairly complete machine code utility for the Amstrad 464 from Hewson Consultants. As such it doesn't suprisingly enough have that much to compete with. Nevertheless it's excellent, combining disassembler, high speed one pass assembler, single and multi step monitor, hex memory editor, file manager and text editor – more or less everything you could want.

You can enter the code like lines of Basic with full error checking for syntax and editor, then step through the completed listing command by command to see how it works. *Zapp* doesn't teach you Z80 machine code – it refers you to Rodney Zack's book for that.

The manual is clear and helpful, covering the main functions of the program and including a useful quick summary. It's not cheap, but the price is justified.



Program *Zapp*
Price *£14.95*
Micro *Amstrad*
Supplier *Hewson*
56B Milton Trading Estate
Abingdon
Oxfordshire

AUTOMATIC

For those people who write their own programs and envy the superloaders used by commercial companies, *Hyperload* may be very welcome indeed. This utility for the Commodore 64 loads disc-based programs around five times faster than normal.

The utility is simple to use, since it intercepts any Load instruction automatically. You even get a general purpose general disc management utility thrown in.

Program *Hyperload*
Price *£6.95*
Micro *Commodore 64*
Supplier *13 Leicester Rd*
Maidstone
Kent ME15 7QA

CRICKET-LIKE

Falcon Patrol on the Commodore was probably the first really good game Virgin Games issued. It was followed by the equally excellent, if largely similar, *Falcon Patrol II* – now that later program has been converted for the Spectrum.

The things that made the original game great were the sonic sound effects and the realistic explosions when the baddies got blasted. On the Spectrum they prove a little difficult to say the least. The sonic engine sounds are replaced by a noise like a cricket clicking its legs.

Everything else is OK, though, the conversion is pretty similar and it still pretty addictive.

Program *Falcon Patrol 2*
Price *£6.95*
Micro *Spectrum*
Supplier *Virgin Games*
2-4 Vernon Yard
Portobello Road
London W11 2DX

This Week

Program	Type	Micro	Price	Supplier
Daley Thompson's Dk	Arc	Amstrad	**£8.95**	Ocean
Hunchback II	Arc	Amstrad	**£8.95**	Ocean
Kong Strikes Back	Arc	Amstrad	**£8.95**	Ocean
Gold Dust Island	Ed	BBC	**£19.95**	John Wiley
Raft Away River	Ed	BBC	**£19.95**	John Wiley
Sheep Dog Trial	Ed	BBC	**£14.95**	John Wiley
Extended Payroll	Ut	BBC	**£57.39**	Micro Aid
Dark Tower	Arc	C16	**£5.95**	Melbourne Hse
911 TS	Arc	Commodore 64	**£9.95**	Eliter
Bounty Bob	Arc	Commodore 64	**£9.95**	US Gold
Cauldron	Arc	Commodore 64	**£7.99**	Palace
Gribbly's Day Out	Arc	Commodore 64	**£7.95**	Hewson
Strangeloop	Arc	Commodore 64	**£8.95**	Virgin
Hi Bouncer	Ed	Commodore 64	**£6.95**	Mirrorsoft
Star Seeker	Ed	Commodore 64	**£9.95**	Mirrorsoft
Hyperload	Ut	Commodore 64	**£6.95**	Private
Drop Zone	Arc	Commodore 64	**£9.95**	US Gold

New Releases

NATURALIST

Gribbly's Day Out is a rarity – a C64 program from Hewson Consultants. It features a frog as hero and in this is close to being unique in the software industry. Gribbly's task is to rescue a number of Griblets (which look like little pebbles) and escort them to the sanctuary of an undersea cave.

This being underwater in scenario, baddies take the form of water and shore-based insects, the worst being a crab whose redesigned pixels positively ooze nastiness. In a break from this strongly naturalist line there is a pulsating undersea energy field which traps many of the Griblets.

This must all sound pretty unlikely as the basis of adrenalin draining entertainment, but *Gribbly's Day Out* proves to be one of the most exciting arcade games I've seen for ages. Firstly the graphics, mixing sprites and redesigned character sets, are superb and beautifully animated. Gribbly, in particular, brings the computer animation of hopping to new heights even though I just can't get the little Frogger to go where I want him to.

It's addictive too, bouncing around the screen, has gleefully manic appeal as you try to land near a griblet and avoid the assorted denizons of the deep. Well above the average arcade game.

Program *Gribbly's Day Out*
Price *£7.95*
Micro *Commodore 64*
Supplier *Hewson Consultants 56B Milton Trading Estate Abingdon Oxon*

CLAMMED UP

The scrolling scenery in this, the latest US gold release, reminds me of the California coastline, with roads hugging tight to the cliffs, dodging every now and then into tunnels.

The behaviour of the other road users, however, is more like the rush hour in Rome.

First of all, you have the clams. Suicidal molluscs, clams, whether in the shell, out of the shell, or on the hoof.

Next, you have Grog. For some reason, when Grog's nose appears on screen, your character goes right up the cliff wall and you lose the game.

Add to these a vicious green monster who moves like a racehorse on speed, assorted rocks and hard places, and the fact that you are riding a unicycle and you have some idea of the problems facing you in *Grog's Revenge*.

Run into Grog, the bug eyed green monster, stalagtites, rocks, potholes, cliff walls or off the edge and you are dead.

The object is to run the clams over, and avoid everything else. Every so often, you run across the evocatively named Fat Broad (sexists take note) who demands a toll of 100 clams before allowing you to continue.

Some way down the line, down some endless shimmering California highway, the meaning of life is kicking its heels just waiting for someone like you to find it.

The graphics are chunky and practical, control of the character is simple, and scoring points is a pain in the neck.

Only a lunatic would like this game. Me, I loved every minute of the thing.

Program *BC 11 - Grog's Revenge*
Price *£9.95*
Micro *Commodore 64*
Supplier *US Gold Unit 10 The Parkway Industrial Estate Heneage Street Birmingham B7 4LY*

CONVERSION

More conversions to the Amstrad from Ocean, including *Daley Thompson's Decathlon*, *Hunchback II* and *Kong Strikes Back*.

As is Ocean's usual form the conventions are very close to the originals in quality and looks on screen.

Hunchback II is a jumping-on-to-ropes-collecting-things kind of game, unoriginal but fairly addictive anyway.

Curiously enough, by far the drabbest screen is the first one which looks very uneventful – later screens are much more complex.

Guide Quasimodo along collecting the bells, dodge the arrows and other things, try to jump on to the ropes and moving platforms. . . abla dee abladah. . . you get the idea.

The Amstrad version looks incredibly like the Commodore version – it doesn't push the machine like *Sorcery* did for example, but still – it's not bad.

Program *Hunchback II*
Price *£8.95*
Micro *Amstrad CPC 464*
Supplier *Ocean Software 6 Central Street Manchester M2 5NS*

BAD BLOOD

Runestone is going to cause a lot of bad blood amongst the tribes of *Doomdark* and *Midnight*. There will be an initial reaction against the game be-

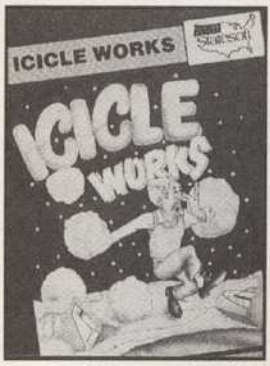
This Week

Ashkeron	Ad	Spectrum	**£5.95**	Mirrorsoft
The Tower of Despair	Ad	Spectrum	**£7.95**	Ocean
911 TS	Arc	Spectrum	**£7.95**	Elite
Cauldron	Arc	Spectrum	**£7.99**	Palace
Everyone's a Wally	Arc	Spectrum	**£9.95**	Mikro-Gen
Falcon Patrol II	Arc	Spectrum	**£6.95**	Virgin Games
Icicle Works	Arc	Spectrum	**£6.95**	State Soft
Amazing Ollie	Ed	Spectrum	**£4.50**	Storm
Ollie Sketchpad	Ed	Spectrum	**£4.50**	Storm
Zapp	Ut	Spectrum	**£14.95**	Hewson

Key: **Ad** – adventure. **Arc** – arcade. **Ed** – education. **S** – strategy-simulation **Ut** – Utility

Pick of the week

SNOWTIME



If you liked *Boulder Dash* (which I didn't much), you'll love *Icicle Works* (and I do) which takes the basic ideas of that game and adds some new elements to make an astoundingly addictive game. That said, I should add that this is technically a very unsophisticated game.

The scrolling is very slow and exceptionally juddery, similarly the character movement is character square rather than pixel.

But as a game, things look different. Like *Boulder Dash* the basis of the game is the movement of boulders (in this case giant snowballs) – the avoidance of avalanches and the manipulation of snowball fall.

The basic idea is to find the pieces of various toys. Sometimes they are simply amidst piles of snowballs and you have to figure out how to get them out without getting bonked. But at other times you have two penguins (which turn into bits of toy) or drop snowballs through boxes marked? In short, there are many ways of getting toys and all require not only fast response, but a good deal of ingenuity. The whole thing is done to time limits so you have to think as well as react fast. I was hooked; pity the graphics aren't better, but buy it anyway.

Program *Icicle Works*
Price *£6.95*
Micro *Spectrum*
Supplier *State Soft*
Business & Technology Centre
Bessemer Drive
Stevenage
Herts SG1 2DY

BIZARRE

Tycoon is a bizarre mixture of trading game and crossword where you buy letters to help you with the crossword and sell words when you can guess them. That's about it really, but it does make for a fairly entertaining game – although it would probably work just as well as a pen and paper game.

There are just two problems with it; the first is that when confronted with the basic Spectrum reviewers test of inputting Stop when asked how many players are required the program crashed with Error in Basic – this is not on, particularly at the price.

In fact, the game appears to be entirely in Basic – not that this is overtly a bad thing, but it just doesn't have the bells and whistles usually associated with Spectrum games. In summary, it's good game idea that to some extent survives some pretty basic programming.

Program *Tycoon*
Price *£9.95*
Micro *Spectrum*
Supplier *Duckworth*
The Old Piano Factory
43 Gloucester Crescent

Compiled by Graham Taylor

New Releases is designed to let people know what software is coming on the market. If you have a new game or utility which you are about to release send a copy and accompanying details to: New Releases, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

cause, simply, it is so heavily inspired by those games that the dread words 'rip-off' will be uttered from every corner of the land. On the other hand *Runestone* may actually be a better game.

In *Runestone* you control three characters Morval, Eliador and Greymarel, warrior, dwarf and wizard respectively. As you choose each character, you see the world through his eyes in the top third of the screen. As you instruct the computer to move you forward, the displayed picture moves towards you – get the picture? You also look in different directions over the land which is populated with a lot of characters called something the something, eg, Norman the naive, Brenda the bold, that kind of thing, so you can see we're well into fantasy novel stuff here.

The idea, guess what, is to find the Runestone of Zaphir and crush Kordomir the Dark One (why these baddies are always named after pipe tobaccoes I'll never know). This means undertaking quests finding friends, etc.

So far so tedious. But what *Runestone* has that *Doomdark* doesn't is a full language analyser, independent characters who carry on doing things even if you don't, and a wide variety of landscapes including the interiors of buildings. You play the game far more like a traditional text adventure, picking up useful objects and taking to other characters. The whole thing ends up being a bit of a cross between *Valhalla* and *Doomdark's Revenge*. The time I've spent with it suggests it's going to be very good indeed – well worth several looks.

Program *Runstone*
Price *£7.95*
Micro *Spectrum*
Supplier *Games Workshop*
27 Sunbeam Road
London NW10

Elite, 55 Bradford Street, Walsall WS1 3QD, 0922 611215. **Hewson**, 7 Grahame Close, Blewbury, Oxon OX11 9QE, 0235 832939. **John Wiley**, Baffins Lane, Chichester, Sussex PO19 1UD. **Melbourne House**, 39 Milton Trding Estate, Abingdon, Oxon OX14 4TD, 0235 835001. **Micro Aid**, 25 Fore Street, Praze Camborne, Cornwall TR14 0JX. **Mikro-Gen**, 44 The Broadway, Bracknell, Herts, 0344 427317. **Mirrorsoft**, Mirror Group, Holborn Circus, London EC1P 1DQ, 01-353 0246. **Ocean**, 6 Central Street, Manchester M2 5NS, 061 832 6633. **Palace**, 275 Pentonville Road, London N1, 01-278 0751. **State Soft**, Business and Technology Centre, Bessemer Drive, Stevenage Herts, 0438 316561. **Storm**, Winchester House, Sherborne, Dorset, 0935 813528. **US Gold**, US Gold, Unit 10 The Parkway Ind Centre, Heneage Street, Birmingham B7 4LY, 021 359 3020. **Virgin**, 2-4 Vernons Yard, Portobello Road, 01-727 8070. **Virgin** Games, 2-4 Vernon Yard, Portobello Road, London W11 2DX, 01-727 8070.

Eighteen months ago, there was a spirit of optimism in school computing generated by Government efforts to fund the purchase of hardware and software.

We were all set for a 'curriculum' revolution; but, alas, it hasn't happened. The interest and the latent enthusiasm are still there: it's just the actual computing that is missing.

The sponsored purchasing programme initially featured only one micro that was directly affordable by most pupils – the *Spectrum* 48K. Unfortunately, official purchasing tended to neglect this machine: pupils bought it for home use, but had to operate different 'Basics' at school.

Neither the DES, nor its agencies, nor the various county computing ventures seem to have appreciated the problem. They have imposed their machines on schools and the results have been predictable enough – many teachers are privately using *Spectrums* and *Commodores*, and also encouraging their pupils to take classroom advantage of the (often excellent) low-cost educational programs that are available.

Another side to the computing malaise in our schools, one the time-tables that govern the use of computing laboratories: where such a laboratory is provided, 40 periods will commonly exist for its actual use – 5 taken away immediately for operational reasons and, let's say, a further 10 for computer studies and 'A' level work. That leaves 25 periods; 8 of which would be used up for *first* year CAP (8 forms, 2 pupils per terminal), and 8 more for *second* year CAP. Thus, about 10 periods remain (in any week) for all the computer assisted learning needs of the school. It will be obvious to all that this represents inadequate provision. Many earnest computer students are going to be sadly disappointed.

The more successful a school is with its CAP lessons, the more acute the time-tabling problem will become; and there are certain groups of children who stand to lose a great deal. Girls may really enjoy computer appreciation. When they select their options at the end of year 3, will these girls be able to opt for computer studies? The time-table might be against them; and there are other forces that might also be operating – the presence of a typing room, and typing teachers; and the lack of computing examinations that specifically seek to provide for the social/business aspects of the subject. All too often, girls are 'advised' away from computer studies yet typing and commerce are no longer sufficient.

At my own school, we have been conducting an experiment to discover strategies that will interest girls in computing – more especially, computing and 'English'. The results are startling: the lessons only take place in 'free' time and yet the girls opt for them. The strategies are simple enough – we produce step-by-step manuals for every application: we have our own 'basic' book: We teach the mothers *and* the daughters: we offer English programs that are directly related to social applications, and we try to instill a spirit of enthusiasm for the new technologies. Pupils cover word processing, but are also familiar with business spreadsheets, and graphics/design packages. This is the world of 'work' brought in to the world of the classroom.

Unfortunately, such an 'English' program does not lead naturally into examination work. The main examination boards have dismally failed to provide any of the necessary courses: Computing is still related to computer studies and, in its turn, this subject is often interpreted in a negative 'hands off' way. For 'arts' pupils, the future is bleak: their own computing skills and enthusiasm are being neglected by those whose job it is to design the examinations.

Other countries already have a significantly higher proportion of their labour force with better qualifications than we do.

We desperately need a computer strategy that is based on the real needs of our society. The potential is there: will it ever be allowed to flower?

Stephen Garber

Cube route

Puzzle No 155

Grubbits, as manufactured by Gibson's Genuine Grubbits Ltd, come neatly packed in one-foot cube boxes.

At a recent stocktaking in the warehouse it was found that these boxes had been neatly stacked into a complete solid rectangular arrangement, and in order to work out the number present it was simply necessary to multiply the numbers along the length, width and height of the arrangement. Curiously, there was the same difference between the length and the width, and the width and the height.

Someone was also overheard to remark that if there was just one box fewer, the rest could be re-arranged to form a perfectly cubic stack.

If, in the original arrangement, no dimension consisted of a single layer, what is the fewest number of boxes that could have been present?

Solution to Puzzle No 150

Out of a total of 7776 possible scores, only 102 of them score over one thousand, making a winning expectancy of only (approximately) one chance on seventy-six, so Sammy's odds of ten to one are wildly in his favour.

```
10 WIN=0:LOSE=0
20 FOR A=0 TO 5
30 FOR B=0 TO 5
40 FOR C=0 TO 5
50 FOR D=0 TO 5
60 FOR E=0 TO 5
70 P=A*B*C*D*E
80 IF P>1000 THEN WIN=WIN+1 ELSE LOSE=LOSE+1
90 NEXT E,D,C,B,A
100 PRINT "WINS:";WIN,"LOSE:";LOSE
```

The program calculates all possible combinations of throws, and counts the winnings and the losses. This gives a total of 102 wins and 7674 losses out of the 7776 possible throws.

Winner of Puzzle 150

The winner is Keith Ratcliffe of Anchorway Rd, Green Lane, Coventry, who receives £10.

Rules

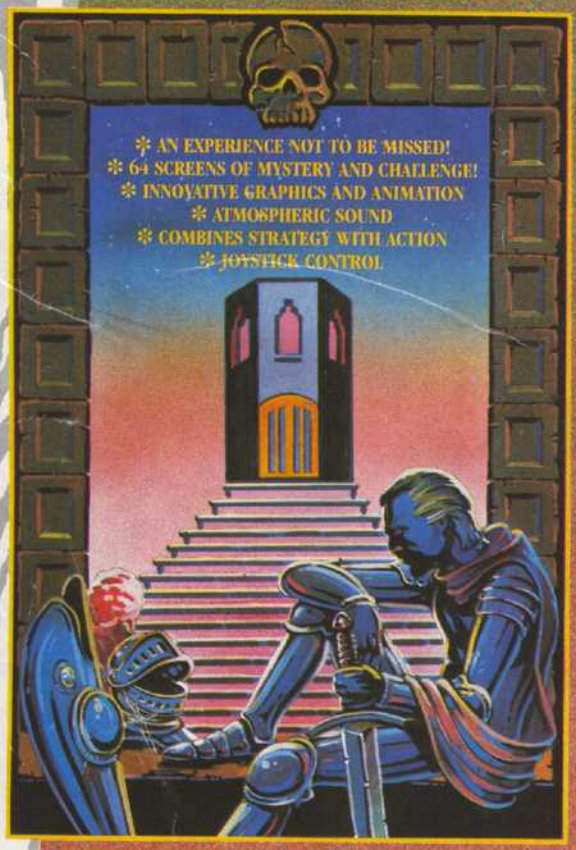
If the puzzle can be sensibly solved using a computer then the winner will have included a listing of the program used to find the correct answer. The closing date for Puzzle No 158 is May 20.

The Hackers

GATES OF DAWN

...A STEP OVER THE THRESHOLD

For time immemorial man has been challenged by the mystery of his dreams. Deep within each dream lies an enigma as yet unsolved. Go now through the Gates of Dawn and experience the recreation of the surreal world of dreams in this vibrant arcade adventure. Enter these portals and lose yourself in a dazzling and perplexing world where nothing is too fantastic.



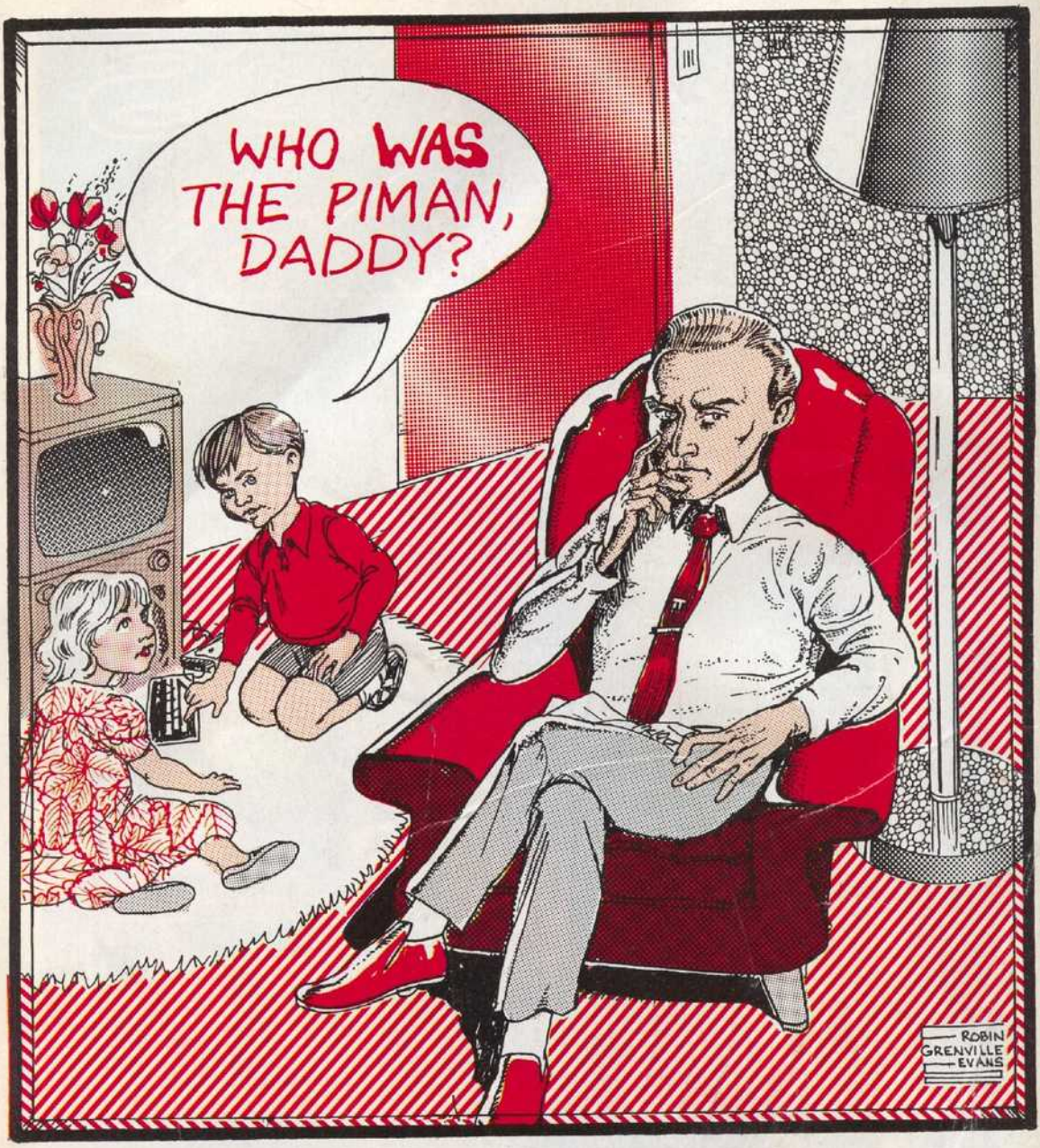
SO PREPARE YOURSELF FOR A SUBLIMINAL EXPERIENCE

Gates of Dawn is available for the Commodore 64 from all good software retail outlets from 15th April.

R.R.P. £8.95 CBM 64

Also available from Virgin Games Limited, 2-4 Vernon Yard, 119 Portobello Road, London W11 2DX. Telephone: 01-727 8070

ADVERTISEMENT



THE SALE OF THE FORTNIGHT! THE SALE OF THE FORTNIGHT! THE SALE OF THE FORTNIGHT!
YES FOLKS! This could be your last chance to buy at these CrAzY 'PI-THETIC SALES SALE!' PRICES!
'10 PACK' Vol.1. 48k Spec. 10 GREAT games on 1 SOUPER DOOPER BUDGIE cassette! Including:-DARTZ, MORRIS MEETS THE BIKERS, PI-BALLED, PI-EYED, PIROMANIA, OLYMPIMANIA, CRUSOE, YAKZEE, NEW WHEELS JOHN? & PI-IN'ERE. Normal shop price (if wholesalers handled it!) £10. But to you NOW ONLY £5 _____

'Go to Jail' 48k Spec. This classic property trading game. Normally sells for £6 ONLY £3 _____

The program voted by the Computer Trade (including Wholesalers!) 'PROGRAM OF THE YEAR' in 1985
'DEUS EX MACHINA' 48k Spec. ____-or- CBM64 ___ (cassette). Normal Price £15. NOW ONLY £5 _____

OFFER ONLY WHILE STOCKS LAST. NO CREDIT CARD SALES. ORDERS MUST BE SENT ON THIS ORIGINAL COUPON

Name _____ Address _____

Post Code _____

Send CHEQUE/P.O. ONLY TO:- AUTOMATA U.K. Ltd. PO Box 78. SOUTHSEA. HAMPSHIRE. PO4 9SL. ENGLAND!