POPULAR Computing WEEKLY

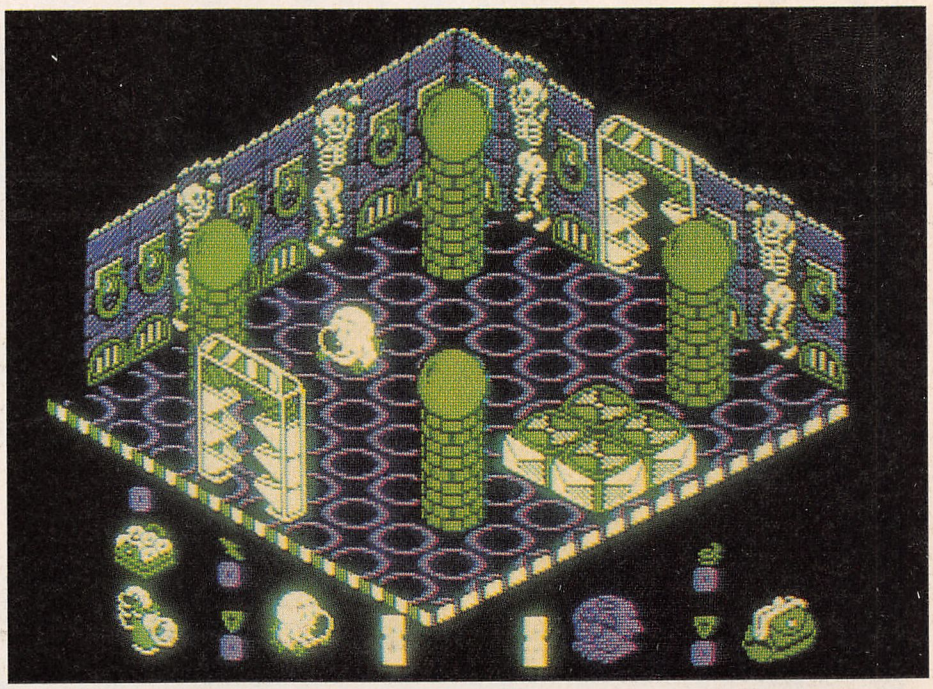
Only 50p.

27 March–2 April 1987

Vol 6 No 13

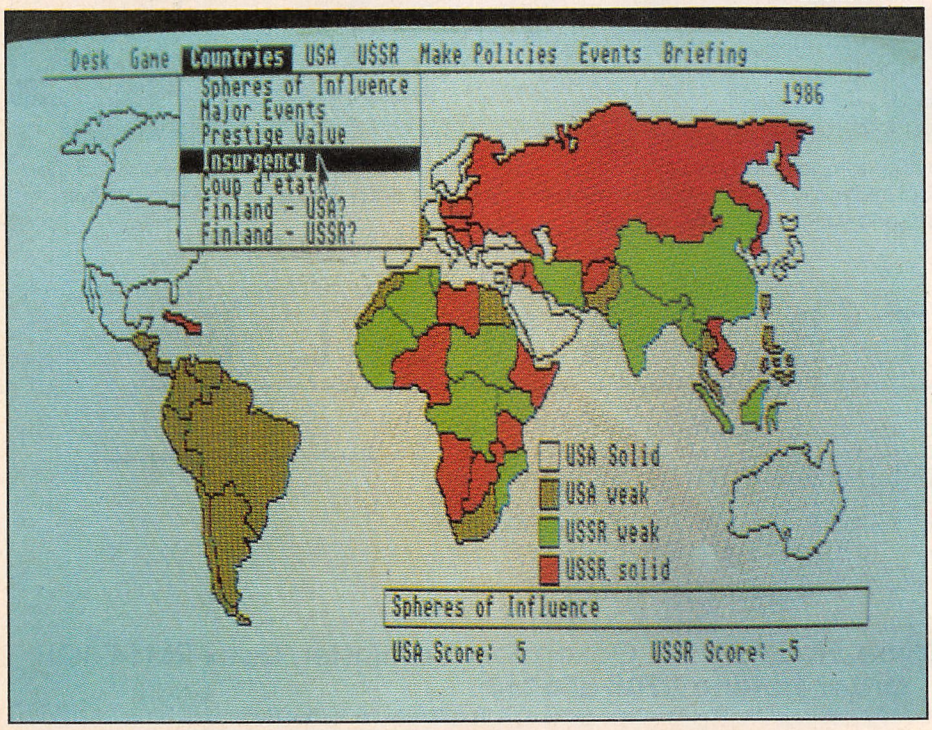
# Sir Clive Sinclair rebuffs his Z88 critics

– see News Desk for details



Head over Heels

Balance of Power

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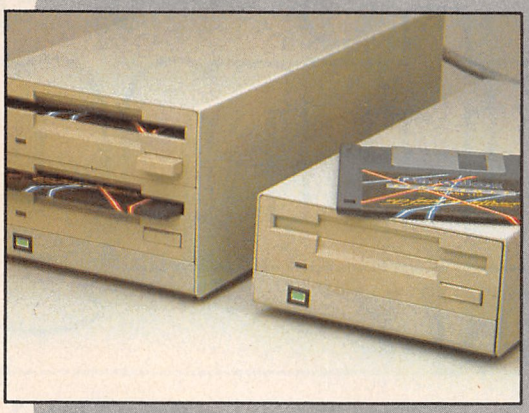
Electronic Arts sets up in UK – see page 5

Head over Heels: new from Ocean

The coldest war yet – Balance of Power

Word processors compared on the ST



T·R·I·A·N·G·L·E

## Floppy Disk Drives

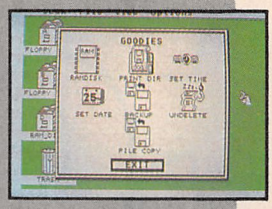
ATARI ST™ AMIGA

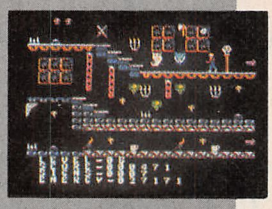
These superb new IMB Disk Drives use the very latest CMOS Technology from N.E.C., have a neat built in PSU and are colour matched and design co-ordinated with the Atari ST series of computers* Each unit comes complete with matching Gem Disk Utility Software and a **FREE ARCADE GAME!**

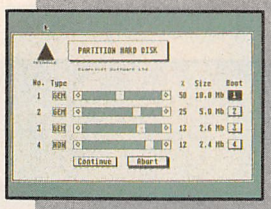
* Triangle ST Floppy drives incorporate the very latest NEC units to ensure ST Compatability. Each unit has 1 year full guarantee, full instructions and a system diskette.

Now available for Commodore Amiga and Sinclair QL.

1 × IMB RRP £129
2 × IMB RRP £209
PRICES EXCLUDING VAT







T·R·I·A·N·G·L·E

## 20MB ST Turbo Drive

ATARI ST™ AMIGA May '87

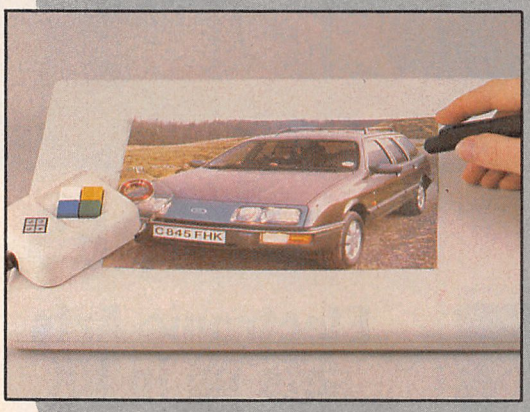
This very fast 20MB Hard Disk Drive is mounted in a stylish co-ordinating unit that sits under the ST's monitor. It's modular design means that optional cards and other devices can be added to the basic unit after purchase. Every turbo drive comes complete with matching GEM *formatting and partitioning software, as well as a disk caching utility that can improve the speed performance of the drive by up to 50%.

*Triangle Turbo Drives are **NOT** restricted to 40 folders.

20MB (Only available from Eidersoft Direct) .....£599
20MB Plus Built-in 1MB Floppy Disk .....£759
(Includes flash bak back-up software)
40MB (Sub 40ms) .....£899

RAM-Cache Card 256K (Opt. 1MB).....£99
SCSI Port + Software (added to hard disk utilities) .....£79.95
(for tape streamers, networks etc)
Flash-Bak Backup Software .....£39.95

PRICES EXCLUDING VAT



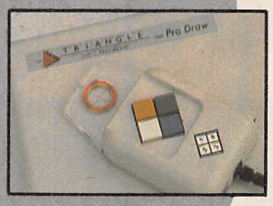
T·R·I·A·N·G·L·E

## Pro-Draw Graphics Tablet

ATARI ST™ C= AMIGA

Pro-Draw is a professional 9 × 6" high resolution graphics tablet for the Atari ST and Commodore Amiga. Pro-Draw is compatible with most ST/Amiga graphics software and the ST Version has been specially interfaced to Mirrorsoft Art and Film Director (available from Eidersoft). Pro-Draw can also be used with IBM™ EGA utilities, with suitable software. Each unit comes complete with PSU, software and stylus. A cross hair puck (£59.95), and A3 tablet are available as optional extras.

ATARI £299 AMIGA £313
PRICES EXCLUDING VAT



Triangle professional hardware is available now from selected dealers (contact us for a list) in the UK or direct from Eidersoft at the address below. If you would like full technical information, don't forget to ask for our **product data sheets** or PD Demo Disk with **FREE GAME** and **Impressive Demo's** (please send £1.95 or diskette and SAE).

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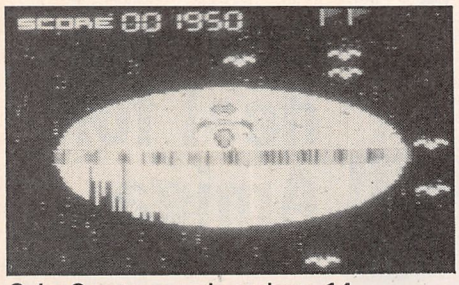
## GAMES



*Solar Coaster* – reviewed on p14


### 13 Arcade Action
Hints and tips for Amstrad CPC games, plus this week's Gallup Top Twenty.

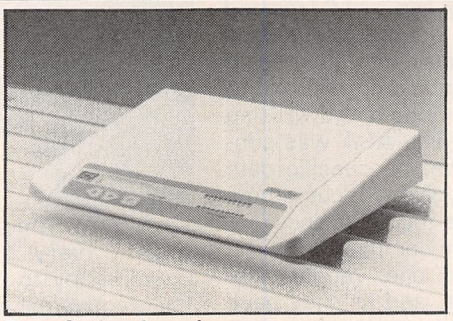
### 15 Reviews
Shoot to kill with *Delta,* the follow-up to *Sanxion* from Thalamus. More follow-ups with *Head over Heels,* by Jon Ritman and Bernie Drummond, who brought you *Batman* last year. And get into politics with *Balance of Power* on the ST, where the Cold War has never been colder.

### 17 Adventure Corner
Tony Bridge passes on some life-saving hints in the classic *Pawn,* and clarifies some of the Megatips featured in our recent adventure supplement.


## HARDWARE ◀SOFTWARE


### 20 Series 4 modem
David Wallin tests out 'the flying wedge', otherwise known as the Pace Series 4 range of modems.

The Series 4 devices are an example of a number of relatively inexpensive modem products coming out, which have many of the features of so-called 'intelligent' modems.



Pace Series 4 modem


### 22 ST word processing
New word processing packages for the Atari STs are appearing almost every week. What can the independent companies offer in terms of power and options? Roger Howorth looks at a selection of three: *First Word Plus, Haba Writer II* and *Boffin,* and draws his conclusions.


## ◀PROGRAMMING


### 24 Programming feature
Keith Hoyle looks into his crystal ball, and foretells of microprocessors of the future.

### 26 QL
Words in your text output will all be properly split between lines with this routine.

### 26 Amstrad CPC
Part two of Unerase, the utility which enables you to rescue deleted files.

### 27 BBC
Multisave is an invaluable program: it will automatically save your data, and author A W Pryer has added a printer utility as well.

### 29 Commodore 64
Part two of the game Xedion.

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ABC

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# Sir Clive throws out criticism of Z88

SIR Clive Sinclair last week insisted that reports of ASA concern (see *Popular Computing Weekly,* March 20) surrounding his new Z88 portable computer were unjustified.

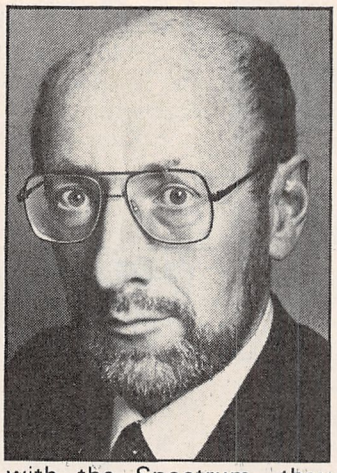
Delays with previous products such as the QL and the C5 can mean that Sinclair's reputation goes before him. Industry pundits, press and advertising watchdogs have all expressed doubts about the new Cambridge Computer machine before and since its launch at the *Which Computer?* show in February. But Sir Clive was adamant.

"The software is on schedule, production of the machine should start in April, and the first customers should receive their machines in the second half of April," he told *Popular Computing Weekly.*

All the peripherals are ready, except for the modem, which is still awaiting approval by British Telecom.

The Advertising Standards Authority had been reported to have sought assurances from Sinclair that advertising for Z88 would correspond to the ASA Code of Advertising Practice. The ASA was concerned that no specific date had been given for customers to receive their machines.

Sir Clive commented, "The ASA had one, repeat one, complaint, and as they have had trouble in the past with computer companies, and



with the Spectrum, they reacted very swiftly. But we're happy to comply with their requirements."

"We're totally confident," he concluded.

# Major coin-op deal for Amiga

COMMODORE International last week announced the signing of a major agreement with Bally to use Amiga technology to develop a new generation of coin-operated games.

In return for Amiga graphics boards and technical knowhow, Commodore will receive software licensing rights to the software developed under the deal.

"This association will particularly enhance the value of the soon-to-be-introduced A500," said Commodore's North America general manager Nigel Shepherd.

The key to the deal is the three Amiga graphics chips. Bally claims that the Amiga's graphics capabilities will be of major importance in its future releases.

"The Amiga's ability to generate over 4,000 different colours, plus special effects capabilities can provide for substantially improved high resolution graphics, not only in our game system, but in our other video products as well," said Bally executive vice president Roger Keesee.

The first game to be launched under the new agreement, *Moonquake,* was launched this week at the Amusement Coin Expo in New Orleans. Commodore UK were unable to give details at the time of writing of when this or any other products of the deal would be available in the UK.

# Amstrad OU deal

LOW COST PC manufacturers Amstrad and Akhter have won a major order to supply the Open University with up to 4,500 machines. The order is thanks to a £2.25 million grant from the Department of Trade and Industry.

Amstrad has the lion's share of the deal, with 80 per cent. The 2250 PC 1512s involved will also come with the DMP 3000 printer. But the deal is also a big boost for Akhter's newly-launched PC range (see separate story).

A DTI spokeswoman said that the computers are for the pool of machines available for rental by students. Students who do this, or buy a machine outright through a new OU discount scheme, will also be entitled to discount on their course fee.

Amstrad and others are taking a keen interest in the development – the Open University thinks that the 1988 figure of 4,500 students on IT related courses will shoot to 13,000 by 1990.

# Activision signs up September

ACTIVISION last week signed a licensing agreement for the hit board game *September.*

The original game is said to be a worthy successor to *Kensington* and *Trivial Pursuit,* and is the brainchild of jobless Londoner Danny Kishon.

He hit upon the idea after spending months riding around America on Greyhound buses, which always took vast detours. Kishon is reported as saying it felt as though an invisible force was keeping him from his destination – hence the game.

*September* was third best-selling game of 1986, even though it was only launched in the last 12 weeks of last year.

*September* will be available, naturally, in September, on Spectrum, Commodore, and Amstrad CPC on tape and disc. Activision was uncertain at the time of writing of exact prices, but it will probably sell for around £10.

# Pastures new for Thalamus

THALAMUS Software has taken Incentive boss Ian Andrew on board as a consultant to the company.

Thalamus, which was set up last year, has released two arcade shoot 'em ups, *Sanxion* and *Delta* (reviewed this issue). Incentive, however, is rather more well-know for its *Graphic Adventure Creator,* although it has had success with arcade games such as *Moon Cresta.*

The appointment follows Thalamus's move into Incentive's offices at Aldermaston, Berkshire. Paul Cooper remains as head of Thalamus.

"I'm acting in an advisory capacity," said Ian Andrew. "Thalamus are with us here, because we had some spare office space and they were looking for somewhere to move to."

# More for Amiga

MICROPROSE indicated its faith in the Amiga this week with the launch of the Amiga version of *Silent Service.*

The game, a simulation of a Second World War submarine in the South Pacific, is available through major distributors and dealers, price £24.95.

# Electronic Arts sets up in UK

ELECTRONIC ARTS is the latest US software company to set up an independent office in the UK, opening at the beginning of April.

Its titles, which include *Skyfox, Mule* and the *Deluxe* range of graphics programs, will now be manufactured in the UK, as well as the US, and the company also plans to convert both existing and forthcoming programs to the Amstrad and Spectrum machines for the UK market. Its main target machines will be the Commodore 64 and IBM PC and compatibles (plus the Apple II in the US).

EOA's products have, up to now, been sold here by Ariolasoft. That contract has now expired, although Ariolasoft will continue to sell its existing EOA inventory until the end of April.

The UK division will operate from Kensington in West London, headed by Mark Lewis from Electronic Arts US on the publishing side, and John Forrest formerly of Thorn EMI overseeing distribution. Stuart Mathie, previously of Activision and US Gold, has joined EOA as sales manager. In Britain, Electronic arts will be known as EOA Ltd, to avoid confusion with a similarly named company.

EOA is also planning to release product originated in Europe both here and in the US, and has indeed already signed deals to distribute Thalamus's *Sanxion* and *Delta,* and Virgin's *Dan Dare* in the States.

According to Electronic Arts' MD, Trip Hawkins, it will also continue writing for the ST and Amiga, but that the ST will be its least supported machine. Hawkins' perception of the potential games market for the ST in the US is 50,000 units, against five million for the Commodore 64 and Apple II, and two million for IBM.

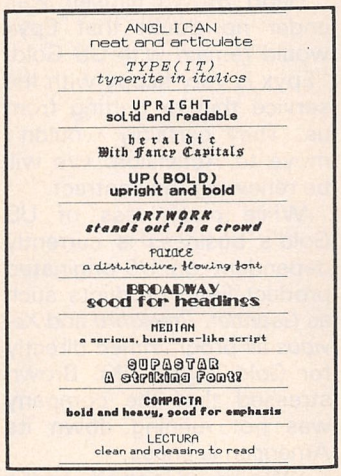
# Tasprint for PCs

TASMAN Software has launched a PC version of its *Tasprint* style writer. *Tasprint* is already available for the Spectrum, Amstrad CPC and PCW.

*Tasprint PC* provides 25 different fonts and a font editor. The program intercepts characters as they are sent to the printer, and allows effects such as boxing and inverse printing, in addition to the 25 fonts. These can be mixed with standard printer fonts.

Tasman claims that the program works with *Tasword PC, WordStar, Lotus,* "and almost all other programs". The company also claims that an incompatible program "has yet to be discovered."

*Tasprint PC* costs £29.95 from Tasman Software, Springfield House, Hyde Terrace, Leeds LS2 9LN (0532) 438301.

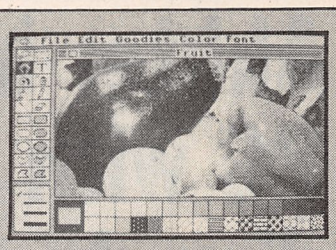



*Tasprint PC* fonts

## Correction

Last week's review of Melbourne House's *Marble Madness,* headed Lost Your Marbles?, quoted the price as £8.95. The correct price is £14.95.

# Software Hotlines




JUST like every computer journalist secretly (well, not that secretly come to think of it) would rather be working for *NME* or *Smash Hits,* increasingly it seems that software houses would rather be in the music biz.

**The Power House** (ex-**Alpha Omega,** budget label vaguely connected with **CRL**) is now putting audio tracks by HEX – whoever they are – after the code on many of their games. More credibly, **Mastertronic** has recently launched its very own record label, *Mastersound,* with the first offering *Heat of Soul* cashing in on those 60s soul tracks that are selling so many Levis on the telly.

But goodness me, how about this for a side splitter, there are some misguided people called **Keep Publishing,** that are going for the most fatal mix of music and computing imaginable. First of all, they are publishing a Spectrum tape mag – that well known load it up, tried and tested concept. But to compound the silliness, it's a tape mag not about computers, but pop music. Called Shake and produced fortnightly for £1.49, ring 0533 511734 for details.

Naturally, here at Sunshine Towers, ever willing to embrace new innovative concepts, we are rising to the challenge and producing our own rival microdrive based mag embracing all areas of what to do when you are driving along in a car and see a red traffic light. We're calling it *Brake.* Ah, the joy of it.

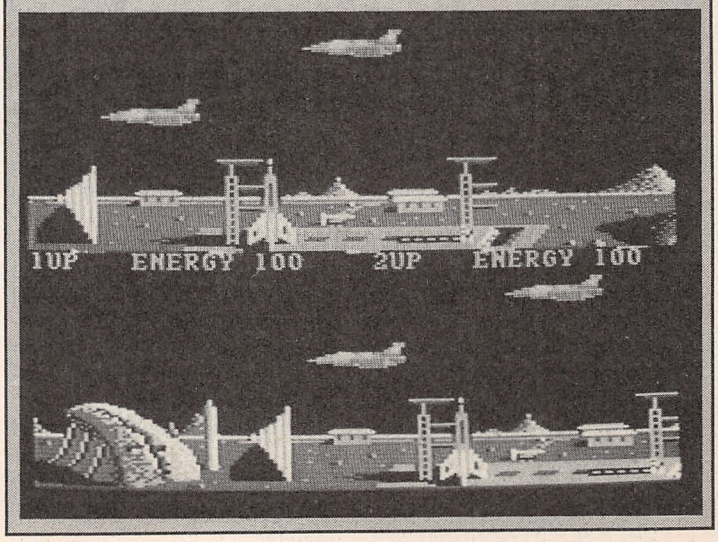
The mighty **Hewson** machine is on the move again, with quite a few releases coming up in May/June. Below we've got a shot of *Eagles* – a shooter for the 64 written by Danish programmers Per Madsen and Bo Nielsen. Haven't had a chance to play it yet, but I'm hoping for a true two-player *Defender.*

Talking of true – the week before last we weren't. Re **The Edge,** Commodore *Shadow Skimmer* is being written by the enigmatic Mat, while *RISK* is being coded by brothers Chris and Tony West. Everyone got that?

News of **Activision's** latest licensing deal – after long negotiations with God Inc, they've swung the exclusive rights to *September* . . . and for a real state-of-the-art package, check out the Big A's *Paintworks* running on the Apple II GS (see above). Fabby or what?

Finally, the **Digital Integration** holier than thou jihad about 'accuracy' goes on, most lately in the shape of a three page letter about that 'accepted criteria' for evaluating products. How about the most telling criteria of all, boys? Sales.

**John Cook**



# Akhter brings out PC with 3½ inch disc drive

AKHTER Group has announced its own entry to the PC market with a range of machines starting at £587 including VAT.

The Akhter PC is available in a variety of configurations, with up to 140MB hard disc capacity, 3½ and/or 5¼ inch floppy discs, colour or mono monitor and mouse.

OEM Divisional Manager Andrew Seal said that the price is determined by the highest price drive in the system, but a full specification system with the Newbury Datadrive, costs £2,935 inclusive.

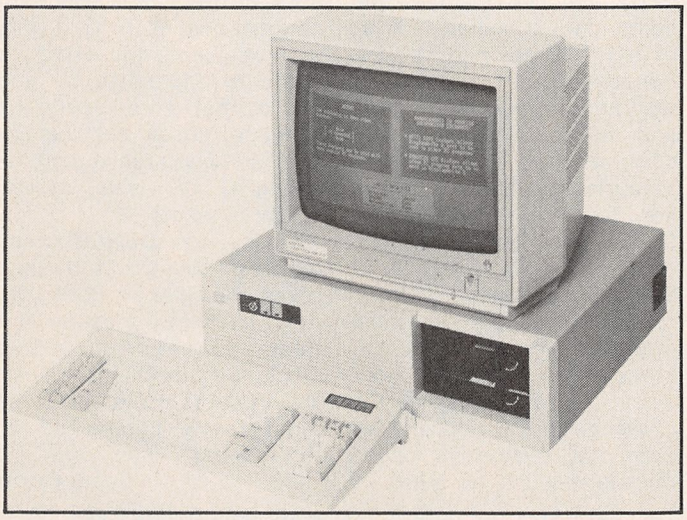
Given the scarcity of PC software on 3½ inch discs, the 3½ inch drive option seems rather a bold move.

"Not at all," commented Seal. "Most people require larger amounts of information on a diskette than they can fit onto a 5¼ inch floppy. Some users also need to post or deliver information on disc, and a 3½ inch diskette is much less likely to be damaged."

Seal went on to give an idea of the kind of users the new range was likely to attract.

"Most of the applications are in interactive information technology, so people are not going to be using it for number crunching," he said.

Further details are available from Akhter Group, Akhter House, Perry Road, Harlow, Essex CM18 7PN.



# Atari/WH Smith latest

IT now looks increasingly likely that WH Smith will stock a "handful" of the Atari ST on a trial basis.

Marketing development manager John Rowland last week confirmed that the chain was nearly ready to try out the machine in a few of its 250 computer departments.

"We think it's a terrific machine, but we think it's price point's a bit high," he told *Popular Computing Weekly*.

"But it's what we play our games on here," he added.

There has been speculation for some weeks that Atari would be successful in getting the ST into some of the chain's stores. But Atari's claims that the deal was all but signed (see *Popular Computing Weekly*, 13–19 March) had previously been dismissed by Rowland.

It is now believed WH Smith will be ready to sign once agreement has been reached on one or two minor details.

# US Gold's Epyx deal in balance

EPYX, one of the leading American software companies, is currently considering its future in the UK.

At present its products, which include *Summer Games, Winter Games* and *World Games,* are published in this country by US Gold under licence.

However, this contract expires at the end of August, and other companies, including Activision, are actively interested in Epyx's account. Rod Cousens, group managing director of Activision, says that the company has been talking to Epyx.

"Epyx wouldn't deny an interest, and they have had discussions with Activision. We talk to a number of companies every week as part of our brief. We're always interested in any company which might benefit from our distribution.

"However, I recognise and respect US Gold's efforts for Epyx – they've done a very good job, and Epyx may well decide to stay with them. Certainly, if I were Geoff Brown (US Gold's MD), I would expect some loyalty."

Geoff Brown himself was under no doubt that Epyx would remain with US Gold. "Epyx is very happy with the service they're getting from us. They certainly wouldn't move to Activision. We will be renewing the contract."

While much less of US Gold's business is currently dependent on US-originated product (with products such as *Gauntlet, Breakthru* and *Xevious* all programmed directly for Gold in the UK), Brown stressed that the company was not running down its American licences.

"We've dropped some not-so-good ones along the way, but we are left now with the quality companies."

A spokeswoman for Epyx in the US would not comment on the situation, except to note the expiry date of Epyx's current contract with US Gold.

# DIARY DATES

## APRIL

11 April
**Dragon Computer Show**
Ossett Town Hall, nr Wakefield, W Yorks
**Details:** Software, hardware and demonstrations for Dragon users
**Price:** £1 adults, 50p children and OAPs
**Organiser:** John Penn, 04203 5970

24–26 April
**The Atari Computer Show**
Novotel, London W6
**Details:** First chance for Atari to show off exciting new strategy
**Price:** £3 adult, £2 children, £1 discount for advance booking
**Organiser:** Database Exhibitions, 061-456 8835

## MAY

2–3 May
**First Ideal Microcomputer Show**
Kensington Exhibition Centre
**Details:** Software, hardware, peripherals for consumer users
**Price:** £3 on door, £2 in advance
**Organiser:** RAMCO International Exhibitions, 01-906 3363

8–10 May
**The Electron & BBC Micro User Show**
New Horticultural Hall, London
**Details:** Software, hardware and peripherals for Acorn's micros
**Price:** £3 adult, £2 children, £1 discount for advance booking
**Organiser:** Database Exhibitions, 061-456 8835

## JUNE

12–14 June
**Commodore Show**
Novotel, Hammersmith
**Details:** First public showing of A500 and A2000 Amigas.
**Price:** £3 adult, £2 children
**Organiser:** Database Exhibitions, 061-456 2991

Prices, dates and venues of shows can vary, and you are therefore strongly advised to check with the show organiser before attending. *Popular Computing Weekly* cannot accept responsibility for any alterations to show arrangements made by the organiser.

# TECHNOLOGY SO ADVANCED ...

### MEMORY
* 512Kbytes RAM (520ST-M, FM)
* 1024Kbytes RAM (1040ST-F)
* 192Kbytes ROM
* 128Kbytes external plug-in ROM option

### ARCHITECTURE
* Motorola 68000 Central Processing Unit (CPU) with a clock speed of 8MHz
* 16-bit external data bus
* 32-bit internal data bus
* 24-bit address bus
* 8×32-bit data & address registers
* 7 levels of interrupts
* 56 instructions
* 14 addressing modes
* 5 data types
* DMA (Direct Memory Access)
* real time clock as standard

### GRAPHICS
* full bit-mapped display
* palette of 512 colours

**Using Atari Monitors** (on 520 & 1040):
* 640×400 high resolution - monochrome
* 640×200 medium resolution - 4 colours
* 320×200 low resolution - 16 colours
* 80 column text display (40 col low res)

**Using Domestic TV** (on 520):
* 640×200 medium resolution - 4 colours
* 320×200 low resolution - 16 colours
* 40 columns × 25 line text display

### SOUND AND MUSIC
* 3 programmable sound channels
* frequency programmable 30Hz - 125KHz
* programmable volume
* wave & dynamic envelope shaping
* programmable attack, decay, sustain, release
* Musical Instrument Digital Interface (MIDI)
* MIDI allows connection of synthesisers etc.

### MOUSE
* high precision
* 2 button control
* free with 520ST-FM/1040ST-F
* non slip ball motion sensor
* removable ball for easy cleaning

### STANDARD SOFTWARE
* GEM desktop + TOS operating system
* ST BASIC interpreter/language system

### INPUT/OUTPUT
* MIDI out ..... (5 pin DIN) 31.25K baud
* MIDI in ..... (5 pin DIN) 31.25K baud
* audio out ... 1.0V DC peak to peak, 10K ohm
* audio in ..... 1.0V DC peak to peak, 10K ohm
* RGB monitor ..... 1.0V DC, 75 ohm
* mono monitor ..... 1.0V DC, 75 ohm
* mono horizontal scan rate ..... 35.7KHz
* mono vertical scan rate ..... 71.2KHz
* sync ..... 5V DC (active low) 3.3K ohm
* modem/serial ..... RS232C, 50 to 19,200 baud
* floppy disk ..... 250 Kbits/s
* hard disk ..... 11.3 Mbits/s
* mouse ..... standard Atari connector
* joystick ..... standard Atari connector
* cartridge port ..... 128K capacity
* RF output (520ST-FM) ..... for TV use

### OPERATING SYSTEM
* TOS with GEM environment in ROM
* hierarchical file structure with sub-directories and path names
* user interface via GEM, with self explanatory command functions
* multiple windows + icons
* window resizing, re-positioning and erasing
* drop down menus (selected by mouse)
* GEM virtual device interface

### COMMUNICATIONS
* RS-232C serial modem port
* 8-bit parallel printer port
* MIDI port (also for networking use)
* VT52 terminal emulation

### KEYBOARD
* standard QWERTY typewriter format
* 95 full stroke keys
* 10 function keys
* 18 key numeric keypad + cursor keys
* variable auto-repeat & key click response
* keyboard processor reduces CPU overhead

# ... IT'S AFFORDABLE

## ONLY FROM SILICA

Finally, there's a personal computer that not only solves problems like other computers, but also solves the one problem that other computers have created. Affordability. Silica Shop are pleased to present the ST range of personal/business computers from Atari. The ST was designed utilizing the most recent breakthroughs in semiconductor technology, producing a personal computer that performs tasks with fewer parts. Which means it costs less to make. And less to buy. The latest ST computers now include built in power supplies and built in disk drives. The TOS operating system and GEM window environment are now on ROM chips which are already installed in the ST keyboard. This enables automatic instant booting when you switch on. Silica Shop are pleased to offer the complete Atari ST range. Our mail order department is situated in Sidcup and we have 4 retail outlets at Sidcup, Orpington, Lion House (Tottenham Court Rd) and Selfridges (Oxford Street). We have eight years experience of Atari products, longer than any other UK company, and are well established as the UK's No.1 Atari specialist. With a group turnover of over £5 million and in excess of 70 staff, we provide unbeatable service and support. We provide several facilities which you will find invaluable during your Atari computing life and most of these facilities are available **ONLY FROM SILICA**. We suggest that you read through what we have to offer, before you decide where to purchase your Atari ST.

### FREE STARTER KIT - Only From Silica

When you purchase any Atari ST keyboard, you will not only receive the best value for money computer on the market, but you will also receive the following from Atari Corporation as part of the package:

** BASIC Language Disk * BASIC Manual * ST Owners Manual * TOS/GEM on ROM*

If you buy your ST from Silica Shop, you will also receive:

** NEOchrome - colour graphics program * 1st Word - Word Processor*

In addition, we at Silica would like to see you get off to a flying start with your new computer, so we have put together a special **ST STARTER KIT** worth over £100, which we are giving away **FREE OF CHARGE** with every ST computer purchased at our normal retail prices. This kit is available **ONLY FROM SILICA** and is aimed at providing users with a valuable introduction to the world of computing. We are continually upgrading the ST Starter Kit, which contains public domain and other licensed software, as well as books, magazines and accessories all relevant to ST computing. Return the coupon below for full details.

### DEDICATED SERVICING - Only From Silica

At Silica Shop, we have a dedicated service department of five full time Atari trained technical staff. This team is totally dedicated to servicing Atari computer products. Their accumulated knowledge, skill and experience makes them second to none in their field. You can be sure that any work carried out by them is of the highest standard. A standard of servicing which we believe you will find **ONLY FROM SILICA**. In addition to providing full servicing facilities for Atari ST computers (both in and out of warranty), our team is also able to offer memory and modulator upgrades to ST computers.

**1Mb RAM UPGRADE:** Our upgrade on the standard Atari 520ST-M or 520ST-FM keyboard will increase the memory from 512K to a massive 1024K. It has a full 1 year warranty and is available from Silica at an additional retail price of only £86.96 (+VAT = £100).

**TV MODULATOR UPGRADE:** Silica can upgrade the 1040ST-F to include a TV modulator so that you can then use it with your TV set. This is an internal upgrade and does not involve any untidy external boxes. A cable to connect your ST to any domestic TV is included in the price of the upgrade which is only £49 (inc VAT). The upgrade is also available for early 520ST computers at the same price.

### THE FULL STOCK RANGE - Only From Silica

We aim to keep stocks of all Atari related products and our warehouse carries a stock of £½ million. We import many software titles direct from the USA and you will find that we have new releases in advance of many of our competitors. Unlike dealers who may only stock selected titles, we have the full range. In addition, we carry a complete line of all books which have been written about the Atari ST. A range as wide as ours is something you will find is available **ONLY FROM SILICA.**

### AFTER SALES SUPPORT - Only From Silica

Rest assured that when you buy your ST from Silica Shop, you will be fully supported. Our free mailings give news of releases and developments. This will help to keep you fully up to date with what's happening in the Atari market. And in addition, our sales staff are at the end of a telephone line to service all of your Atari requirements. If you purchase an ST from Silica and would like any programming or technical advice, we have a full time technical support team to help you get the best from your computer. Because we have both the staff and the systems specifically dedicated to providing after sales service on Atari ST computers, we are confident that our users enjoy an exceptionally high level of support. This can be received **ONLY FROM SILICA**.

### FREE CATALOGUES - Only From Silica

At Silica Shop, we recognise that serious users require an in-depth information service, which is why we mail free newsletters and price lists to our ST owners. These are up to 48 pages long and are crammed with technical details as well as special offers and product descriptions. If you have already purchased an ST and would like to have your name added to our mailing list, please complete the coupon & return it to us. The information service is available **ONLY FROM SILICA**.

### FREE OVERNIGHT DELIVERY - From Silica

Most orders are processed through our computer within 24 hours of receiving them. Most hardware orders are sent by the overnight METRO courier service FREE OF CHARGE to customers within the UK. This method helps to ensure minimum delay and maximum protection.

### PRICE MATCH - Only From Silica

We hope that the combination of our low prices, FREE UK delivery service, FREE Starter Kit and FREE after sales support, will be enough to make you buy your Atari equipment from Silica Shop. If however, there is something you wish to purchase, and you find one of our competitors offering it at a lower price, then please contact our sales department, providing us with our competitor's name, address and telephone number. If our competitor has the goods in stock, we will normally match the offer (on a 'same product - same price' basis) and still provide you with our normal free delivery. We realise that we are not the only company who will match a competitor's price. However, if you come to us for a price match, you will also be entitled to our after sales service, including free newsletters and technical support. This makes our price match promise rather special, something you will receive **ONLY FROM SILICA**. We don't want you to go anywhere else for your Atari products. So shop at Silica, the UK's No1 Atari Specialist.

## 520ST-M

The affordability of Atari computers is reflected in the price of the 520ST-M keyboard, which is a mere £259 (inc VAT). This version of the ST comes with 512K RAM, as well as a modulator and lead for direct connection to any domestic TV. The price does not include a mouse. In addition, when you buy your 520ST-M from Silica, you will also receive the FREE Silica 'ST Starter Kit'. During 1987, many software houses will be producing games software on ROM cartridges, which will plug directly into the cartridge slot on the 520ST-M keyboard, giving instant loading without the expense of purchasing a disk drive. With the enormous power of the ST, you can expect some excellent titles to be produced, making this the ultimate games machine! If your requirement is for a terminal, then the 520ST-M can fulfill this role too. Leads are available to connect the ST to a variety of monitors, and with the imminent introduction of terminal software on ROM cartridge, the ST provides a low price terminal for business use. If you wish to take advantage of the massive range of disk software available for the ST range, you will need to purchase a disk drive. Atari have two floppy disk drives available, a ½ Mbyte model £149 and a 1Mbyte model £199. Full details of these drives, as well as the Atari 20Mbyte hard disk are available on request. If required at a later date, the mouse may be purchased separately.

**£259**

## 520ST-FM

The 520ST-FM with 512K RAM and free mouse, represents a further breakthrough by Atari Corporation in the world of high power, low cost personal computing. This model is the latest addition to the ST family, and is not only powerful, but compact. It is priced at only £399 (inc VAT) a level which brings it within the reach of a whole new generation of computer enthusiasts. When purchased from us, it comes with the FREE Silica 'ST Starter Kit' see paragraph on the left. To make the 520ST-FM ready for use straight away, Atari have built into the keyboard a ½ megabyte disk drive for information storage and retrieval, allowing you easy access to the massive range of disk based software which is available for the ST. This new computer comes with all the correct cables and connections you will need to plug it straight into any standard domestic television set. You do not therefore have to purchase an Atari monitor. If you do require a monitor however, these are available with the 520ST in the following money saving packages:

| | | |
|---|---|---|
| *520ST-FM Keyboard* | *Without Monitor* | *- £399 (inc VAT)* |
| *520ST-FM Keyboard + High res mono monitor* | | *- £499 (inc VAT)* |
| *520ST-FM Keyboard + Low res colour monitor* | | *- £599 (inc VAT)* |
| *520ST-FM Keyboard + Med res colour monitor* | | *- £699 (inc VAT)* |

Because the 520ST-FM has its own power transformer built into the keyboard, there are no messy external adaptors to clutter up your desk space. You are left with only one mains lead, serving both the disk drive and the computer. You couldn't ask for a more stylish and compact unit.

**£399**

## 1040ST-F

For the businessman and the more serious home user, Atari have their most powerful model, the 1040ST-F with 1028K RAM. This low cost powerhouse can be introduced into a business environment as a stand-alone system, or can support a mainframe computer as a terminal. The 1040ST-F not only features twice as much memory as the 520ST-FM, but also includes a more powerful built-in disk drive. The drive featured on the 1040ST-F is a one megabyte double sided model. The extra memory facility of the 1040ST-F makes it ideal for applications such as large databases or spreadsheets. Like the 520ST-FM, the 1040ST-F has a mains transformer built into the console to give a compact and stylish unit with only one mains lead. The 1040ST-F is also supplied from Silica Shop with a free software package and 'ST STARTER KIT'. In the USA, the 1040ST-F has been sold with a TV modulator like the 520ST-FM. However, for the UK market, Atari are manufacturing the 1040ST-F solely with business use in mind and it does not currently include an RF modulator, this means that you cannot use it with a domestic TV (Silica Shop do offer a modulator upgrade for only £49). The 1040ST-F keyboard costs only £599 (inc VAT) and, unless a modulator upgrade is fitted, will require an Atari or third party monitor. There are three Atari monitors available and the prices for the 1040 with these monitors are as follows:

| | | |
|---|---|---|
| *1040ST-F Keyboard* | *Without Monitor* | *- £599 (inc VAT)* |
| *1040ST-F Keyboard + High res mono monitor* | | *- £699 (inc VAT)* |
| *1040ST-F Keyboard + Low res col monitor* | | *- £799 (inc VAT)* |
| *1040ST-F Keyboard + Med res col monitor* | | *- £899 (inc VAT)* |

The 1040ST-F comes with a mouse controller and includes 1Mbyte of RAM. It has a 1Mbyte double sided disk drive and mains transformer, both built into the keyboard to give a compact and stylish unit, with only one mains lead.

**£599**

**ATARI ST**

**SIDCUP** (& Mail Order) ..... **01-309 1111**
*1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX*

**LONDON** ..... **01-580 4839**
*Lion House (1st floor), 227 Tottenham Court Rd, London, W1*

**LONDON** ..... **01-629 1234 ext 3677**
*Selfridges (1st floor), Oxford Street, London, W1A 1AB*

To: Silica Shop Ltd, Dept PCWK 0287, 1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX

**PLEASE SEND ME FREE LITERATURE ON THE ATARI ST**

**Mr/Mrs/Ms:** ..... **Initials:** ..... **Surname:** .....

**Address:** .....

.....

.....

..... **Postcode:** .....

**Do you already own a computer**
**If so, which one do you own?** .....

# The price of success

*Budget software is now substantially outselling full-priced products, according to Gallup. John Brissenden investigates this growing trend*

**"Probably in excess of two thirds of all computer games are sold at a £1.99 price point."** *(Gallup's weekly newsletter Chartalk, March 2–7 1987)*

For several months past it's been the budget titles that have hogged most of the upper reaches of the Gallup chart.

The newsletter, which reports the changing trends within the chart, goes on to suggest: "The consumer perception – value for money – may force a general downward movement in pricing for all but the truly exceptional product . . . Is the absence of a single big full-price independent original title in the last five months . . . the bell-toll for the vast majority of £9.95 computer games?"

This is dramatic stuff, particularly when you take into consideration the fact that Gallup's charts are likely to be weighted against budget sales. Newsagents, supermarkets and service stations, where many budget lines can be bought, do not return figures to the Gallup poll.

However WH Smith is a major contributor to Gallup's chart figures. Marketing development manager John Rowland says that the budget titles are gaining ground.

"That does seem to be the trend. We've preferred to compete on a wide range of full-price software. But space is limited, and we've now got some 100 budget titles in our larger stores, compared to 20 last year."

Bulldog/Mastertronic, Firebird, and the recently established Codemasters have been at the forefront of this success. Do they think that £1.99 titles now have a permanent claim on the top end of the chart, and therefore the pockets of the public?

"Yes. The trend is there, and has been for some considerable time. The market for full-price titles is for very good product," says Mastertronic director Alan Sharam.

He asserts that the situation is more in favour of low-price titles than the charts suggest.

"The true position is that Mastertronic does more business in one store in a week, than other companies do altogether over the same period."

Codemasters' Jim Darling agrees. "Gallup's saying what we've known for two or three years. If the Commodore 64, for example, is programmed by an experienced programmer, with professional music and graphics, that's about as much as you can do.

"Now whether you price that game at £1.99 or £9.95 is down to the marketing."

Darling reckons that the full-price companies don't pay any more for their games than Codemasters or Mastertronic pay for a budget title. But the prohibitive effect of the higher price means that extra money must be spent on promotion – in other words, the higher price generates its own overheads.

"If you come in with a product at £1.99, people tend to think it's rubbish. It took a while for the end user to realise that low-price items aren't rubbish," Darling went on.

"Now, the kids aren't convinced that a £9.95 price point means high quality."

This is not an opinion shared by his competitors. Virgin Games flirted unsuccessfully with the budget end of the market before concentrating on full-price material. Patricia Mitchell of Virgin thinks that both sectors are necessary and can coexist.

"If the future of software is to be ensured, you've got to spend money on development. It's all right if you've got programmers working in their spare time, but then you're not going to get the highest standards.

"Now, with the 16-bit machines going into the home, it's taking six months, with several people, to develop a game. You've got to charge, otherwise you'll never recoup your investment.

"The cost of high quality software has got to be reflected in the price," she went on. "I don't think it will ever be all budget titles, but certainly anything that keeps the kids interested is always welcome."

Mitchell also stated that Virgin had no plans to handle budget titles again in the future.

Tom Watson, marketing manager for Firebird, feels that full-price software is a guarantee of quality, and can compete successfully in the marketplace.

"With budget software, there's precious little work put into new titles. There rests (on full-price software companies) the obligation to maintain the production of highly original and novel software.

"Without products of the standard of, say, *Cholo,* eventually the industry will grind to a halt," Watson went on.

"Besides, it's always tied to market forces. Even if a full-price title only sells 40 or 50 per cent of what a budget item sells by volume, in cash terms that's still a large amount of money."

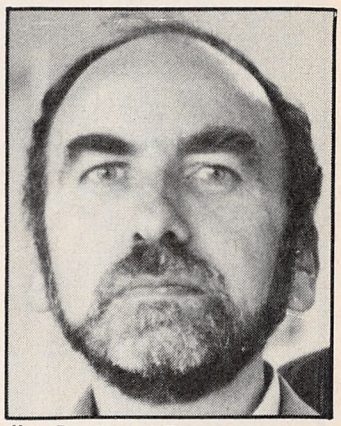
John Rowland sees the other side of the coin. "In cash terms, we only have two budget titles in our top 50 at any one time. But in unit terms, we probably have quite a number."

Watson maintains that full-price titles don't have to be exceptional just to be able to compete for sales.

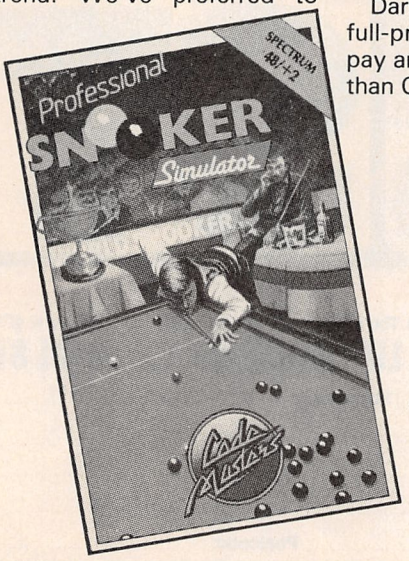
"So called ordinary titles are still selling very nicely, thank you," he said.

Darling thinks that full-price manufacturers are bluffing. As far as he's concerned, the success of the budget titles is not only permanently changing the market, but the full-price companies are unable to adapt to the new conditions.

"If I was in charge of a full-price software house, I don't know what I'd do."



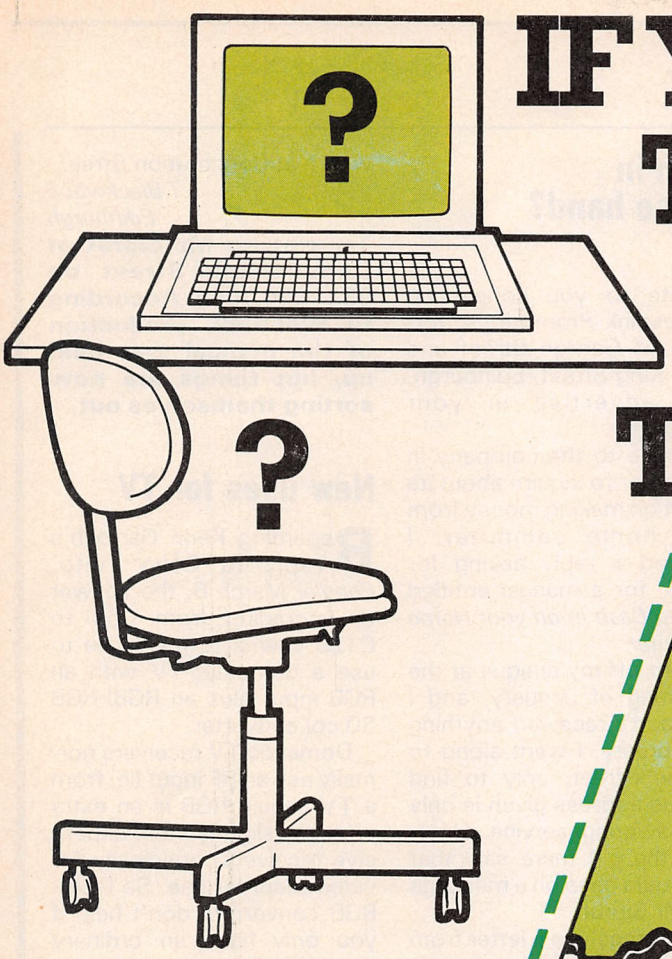
**Jim Darling: "The kids aren't convinced that a £9.95 price point means high quality"**




**Codemasters' *Professional Snooker Simulator* – nine weeks on the Gallup chart at £1.99**

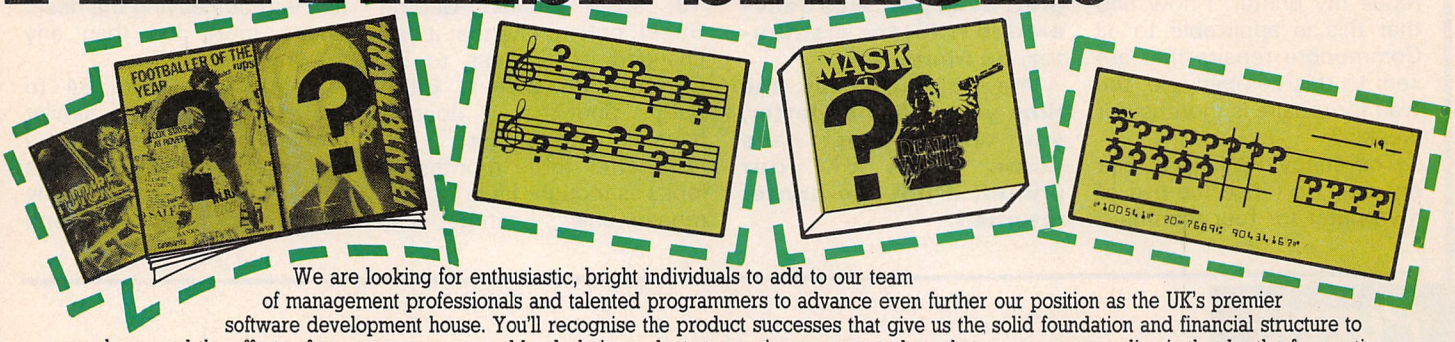
We would like to hear your views on the budget vs full-price software debate. Are the budget titles good value for money, and do you buy them in quantity? Does a full-price tag guarantee quality?

Do you see budget games as a separate entity from the full-price offerings? Let us know what you think and we'll publish a selection of your letters.



# IF YOU CAN FILL THESE SPACES IN ANY OF THESE PLACES

# WE ALREADY FILL THESE SPACES




We are looking for enthusiastic, bright individuals to add to our team of management professionals and talented programmers to advance even further our position as the UK's premier software development house. You'll recognise the product successes that give us the solid foundation and financial structure to properly reward the efforts of our programmers and back their products to maximum success, but what you may not realise is the depth of expertise we include in our 30 strong team – music and animation being only two of the specialisms available "in house", state of the art equipment being included as essential tools.

Now we are propelling our successes to even greater heights not only by acquiring exciting new licences for smash hit products but by opening new software development offices (Canada and USA included – so start packing your bags!!) to increase the pool of products that will elevate the name of Gremlin from the UK's No. 1 to World No. 1.

If you have the talent, come in from the cold and join a team of professionals that's geared to not just get the best from you, but to give you back much, much more.

# SO FILL THIS SPACE NOW!!

*Name* _____ *Previous Projects* _____

*Address* _____

*Telephone* _____

**Gremlin Graphics Software Ltd.**
**Alpha House, 10 Carver Street, Sheffield S1 4FS**

GREMLIN

**THERE'S ALWAYS SPACE FOR TALENT IN THE GREMLIN TEAM!**

# Letters

## Falling rocks

In *Popular,* March 13, there was a letter regarding the originality of Rockfall published in your magazine.

The machine code routine used in the game was written by Maxime Frenot, and by permission I incorporated it in my program. The redefinition of characters was done using a program released a long time ago by Rabbit Software.

*Craig Davenport*

**And why didn't you tell us this in the first place?**

## Here, Verran everywhere

I am requesting your help with a problem I have with my Commodore MPS803 printer and Verran Micros since last December.

The printer was eight months old and not used much when the head went faulty, so it was returned, under guarantee, and then sent to Verran on December 12.

After repeated phone calls and requests for my printer back, I still got the same answer from Tanya Renton of Verran, that Commodore will not give them the parts to repair my printer. I now find that this is applicable to all Commodore repairs that are sent to this company, ie, the wait for repairs is months not weeks.

The annoying thing is that not only do I lose the use of my printer for four months, I also lose four months of the guarantee.

*J E Masterman*
*Leeds*

**We spoke to both Nigel Brown, Verran's MD, and Chris Kaday, head of Commodore UK. The situation is as follows:**

**Nigel Brown says that Verran has had difficulty obtaining spares for Commodore printers, and although Commodore has made inroads into improving the situation, the print head order was made last July (parts being ordered in bulk as they run out, rather than for each specific repair as it arises), but it has still not arrived.**

**Kaday agreed that the situation as regards the supply of spare parts was unsatisfactory, but that the problems were now alleviating.**

**It appears that when Commodore set up an independent distributor for the supply of its spare parts, about a year ago, there were teething troubles in getting the new operation going.**

**However, Kaday stated categorically that the print head part was delivered to HRS, the distributor, on March 12.**

**We hope that by the time you read this letter, you will at least have some news of your printer, if not the printer returned.**

## Cash in whose hand?

I write to you concerning Westlink Promotions, formerly of George Street and Great King Street, Edinburgh, who advertise in your magazine.

I wrote to the company in December to inquire about its advert on making money from your home computer. I received a reply asking for £6.95, for a manual entitled *How to Cash in on your Home Computer.*

I sent off my cheque at the beginning of January, and I still hadn't received anything by February. I went along to George Street, only to find that the address given is only an answering service. However, the girl there said that she would pass on a message to a Mr Ciprut.

I later received a letter from Westlink, saying that it was waiting for new and bigger publications and that I would receive my book no later than February 28.

Needless to say I still did not receive it, but I did get a letter apologising for the delay, and saying I would definitely have it by March 10. It still hadn't arrived on March 13, so I phoned George Street, only to find that it had changed its address to 55 Constitution Street, Edinburgh, and that it doesn't have a phone number.

So after three months, it looks as though I have lost my money, unless I can get anywhere at Constitution Street.

*T Blackwood*
*Edinburgh*

**Try ringing Mr Ciprut at Constitution Street on 031-554 0654. According to Westlink, production of the manual was held up, but things are now sorting themselves out.**

## New uses for TV

Regarding Kenn Garroch's reply to Colin Tinto, *Popular* March 6, the answer to upgrading from C64 to C128 seems to me to be to use a domestic TV with an RGB input plus an RGBI-RGB 80 col converter.

Domestic TV receivers normally use an RF input (ie, from a TV aerial); RGB is an extra on some slightly more expensive receivers, principally for video-recorder use. So RGBI-RGB converters don't help if you only have an ordinary domestic TV.

I use a Sony KV-1440UB TV with RGB input and a Trilogic-3 interface which allows both 80-col and 40-col modes with full colour in both modes. I am extremly happy with the result and one has the added advantage of being able to switch to TV in moments of boredom or frustration without leaving the desk. That's more fun than any monitor I know!

In upgrading from 64 to 128, I went through similar problems to Colin's, and I must say that I found the people at Trilogic extremely helpful with their advice and

# Puzzle

**Puzzle No 251**

Joe, Bill, and James are grandfather, father, and son respectively. They all share the same birth date (January 1). When Bill was born his father's age, in years, was an exact square. Curiously, when Jim was born, Bill was also celebrating a 'square' birthday.

Even more remarkable, the years of birth of all three were prime numbers.

Can you say when, most recently, this curious state of affairs could have occurred?

**Solution to Puzzle No 246**

The shortest length was 38 yards, 1 foot, 0 inches. This equals 1380 inches, a value that contains the same digits.

Starting with a value of one yard, the program generates all ascending lengths in one inch steps. This value, in yards, feet and inches, is converted into inches at line 40, and this variable is converted to a string variable in line 50. The original yards, feet, and inches values are also converted to a string (J$).

These two strings are then compared to determine if they both contain identical digits. This is done by means of the subroutine which arranges the contents of both strings into digital order. The two resulting strings can then be compared to see if they form an exact match.

**Winner of Puzzle 246**

This week's winner is Rod Stephen, of Kincardine, Scotland, who will receive £10.

**Rules**

The closing date for Puzzle 251 is April 17. Answers should include a program listing if possible.

```
100 LET Y=1
110 FOR F=0 TO 2
120 FOR I=0 TO 11
130 INCHES=Y*36+F*12+I
140 IN$=STR$(INCHES)
150 J$=STR$(Y)+STR$(F)+STR$(I)
160 IF LEN(IN$)<>LEN(J$) THEN 200
170 Z$=IN$:GOSUB 230:IN$=Z$
180 Z$=J$:GOSUB 230:J$=Z$
190 IF J$=IN$ THEN PRINT INCHES,Y;
    "yds ";F;"ft ";I;"ins":STOP
200 NEXT I
210 NEXT F
220 Y=Y+1:GOTO 110
230 FL=0
240 FOR T=1 TO LEN(Z$)-1
250 IF MID$(Z$,T,1)>MID$(Z$,T+1,1)
    THEN Z$=LEFT$(Z$,T-1)
    +MID$(Z$,T+1,1)+MID$(Z$,T,1)
    +MID$(Z$,T+2):FL=1
260 NEXT
270 IF FL=1 THEN 230
280 RETURN
```

their delivery service very efficient. Not only that, but at less than £28 the interface seems to me, just another punter, as super value for money.

As far as running CP/M on a 1541 drive is concerned, it's not really worth the trouble with anything less than the 1571 anyway as CP/M programs tend to require a lot of disc access. Colin would probably be far happier with programs written specifically for the 128 – there are many of extremely good quality which leave the CP/M equivalents for dead.

*Peter Lee Webb*
*Aberdeen*

*"That one's for Mrs Kerr of London, NW3 . . . that one's for Mr Macdonald of Glasgow . . . that one's for . . ."*

## The original ribbon re-inker

I was rather hurt by your news item in issue March 13 headed PCW Ribbon Service, in which praises were heaped upon a company in Cardiff claiming ribbon re-inking as their "original idea". After all, I have been advertising such a service in *Popular Computing Weekly* regularly since June 1986! Furthermore, I completely fail to see how Mr Maragna can claim his idea is original, as I re-inked three ribbons for him last November (for £4.50).

I can re-ink most makes of ribbon (not only the PCW), my introductory price is only £1.50, and I already have over nine months of customer satisfaction under my belt. I can also re-ink single-colour ribbons, as well as black (introductory price £2), and can offer home re-inking kits for certain types of ribbon.

*Nick Godwin*
*Aladdink*
*Berwickshire*

## Monkey business

You were kind enough to publish my letter re puzzles, under the heading "Monkey Puzzles" and I hope you will also publish this. Thank you Mr G. Lee. Your puzzles really are enjoyable and I apologize profusely, genuflecting with my P.C.B. and 16 bit microprocessor held aloft in total surrender. O.K.! O.K.! you were and are right. You see I deal with the problems from a purely number theoretic point of view forgetting completely that the setter could have a bent for the esoteric Sherlock Holmes/crossword puzzle problem. As I say – sorry Gordon – all is forgiven!

*Frank Hughes*
*Abergele*

## Leicester QL group

I am writing to inform all Leicestershire readers about the existence of a new Sinclair QL club, open to anyone who has an interest in the Sinclair QL. Further information can be obtained from Peter Ash, 53 Woodland Road, Leicester (0533 766857) or Douglas Johnstone, 70 Cedar Road, Blaby, Leicester (0533 775175).

*Douglas Johnstone*
*Leicester*

## Amstrad NW group

I would like to inform your readers of the user group called ANWUC (Amstrad North West User Club), The club has just reached a membership of 2,530 Amstrad users from 13 countries around the world.

ANWUC has now been active for almost two years and has become one of the biggest user clubs in the North. The club now spans the globe from Singapore, Hong Kong, Australia, New Zealand, Tasmania, to several European countries as France, Belgium, Germany, Switzerland, Austria, Denmark, Sweden, Norway and Ireland. At the moment the club is in contact with several US CP/M user groups.

The club produces its own news magazine for it's members throughout the world.

ANWUC holds its weekly meetings every Wednesday from 3 till 10pm and has over 70 members per meeting. It has discounts for its members, from 3 inch and 5¼ inch discs to disc drives, CP/M books, Thingi's, AMX Mice, *Pagemakers,* games, programs and public domain software.

ANWUC has its own Sig on T P Fido: 061-494 6938, 8 bits, no parity, 1 stop bit, 300/300, 1200/75. On connecting with the board hit the Return about twice a second (this lets the host computer know at what speed you are communicating) and then answer the questionnaire. MSGS to ANWUC should be left under area 7.

The club covers the full range of Amstrads computers from the CPC464 to the PC 1512 and has discount at several local computer stores.

*C Heyliger*
*41 Millwall Close*
*Gorton*
*Manchester M18 8LL*

We're sorry but *Popular Computing Weekly* cannot guarantee to reply to *all* letters requesting a personal answer. It helps us enormously if readers are prepared to have general queries answered on these pages, so, if possible, please do not send SAEs.

# Queen – under pressure

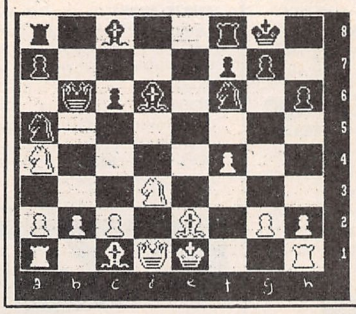
Back to Game One in the Readers vs *Colossus* chess tournament, where the Readers team is playing black, this week's Readers vote elected to move the queen from c7 to b6 (see diagram below for details).

*Colossus,* playing white, has replied by moving the c3 knight to threaten the black queen.

## Your next move

Where do you think black should play next? Send your suggested move to *either* Inter-Mediates (*Popular* Chess), Freepost, Sawbridgeworth, Herts CM21 9YA (you do not need to use a stamp with this address), *or Popular* Chess, Unit 2, The Maltings, Sawbridgeworth, Herts CM21 0PG (with a stamp).

Please note that if you use Freepost, your entries must be posted promptly – Freepost is slower than paid-for mail. All entries must reach either address by Wednesday, April 1.



The move which gets the most votes will be entered into the game. Results and *Colossus*'s response will be published in two weeks' time.

## Prizes

A British Museum reproduction Arran chess set will go to the person suggesting the most accepted moves at the end of the game. Five copies of *Colossus Chess 4* (available for most popular micros) will go to the most consistent entrants for the duration of the game.

*Next week, we return to Game Two, where the Readers are playing white.*

## Game One

**The moves so far:**

| | | |
|---|---|---|
| **1** | Pe2–e4 | Pe7–e5 |
| **2** | Ng1–f3 | Nb8–c6 |
| **3** | Bf1–c4 | Ng8–f6 |
| **4** | Nf3–g5 | Pd7–d5 |
| **5** | Pe4xd5 | Nc6–a5 |
| **6** | Bc4–b5+ | Pc7–c6 |
| **7** | Pd5xc6 | Pb7xc6 |
| **8** | Bb5–e2 | Ph7–h6 |
| **9** | Ng5–f3 | Pe5–e4 |
| **10** | Nf3–e5 | Bf8–d6 |
| **11** | Pd2–d4 | Pe4–d3 (en passant) |
| **12** | Ne5xd3 | Qd8–c7 |
| **13** | Nb1–c3 | Ke8–g8 o–o |
| **14** | Pf2–f4 | Qc7–b6 |
| **15** | Nc3–a4 | ? |

# Evesham Micros

**ALL PRICES INCLUDE VAT & DELIVERY**

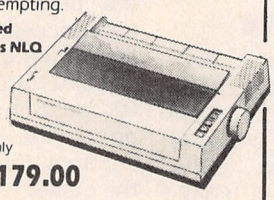
## PRINTERS

**Look at our special prices on top quality selected printers. Prices quoted include VAT, insured receipted delivery and parallel/Centronics printer cable to suit your micro (please state type when ordering). Spectrum or QL owners please add £20.00 to price for supply of Centronics interface.**

### Panasonic KXP1080

Fantastic quality and value. A truly reliable printer at a price that is very tempting.

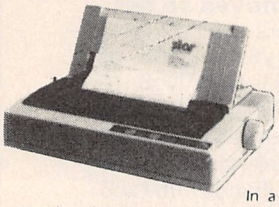
- **Friction and tractor feed**
- **100 cps draft and 20 cps NLQ**
- **Epson compatible interface**
- **Wide range of print styles**



**You could pay a lot more than this for a lot less printer**

Only **£179.00**

### THE star PRINTERS FOR BUSINESS — NL-10



***WHICH* MAGAZINE BEST BUY**

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Automatic cut sheet feeder available as an option for **£63.25**

**Don't buy** any other sub £300.00 dot matrix printer until you have seen this one. Combines many unique features with **superb reliability, styling and print quality.** Interchangeable interface cartridges mean it will suit any computer; ideal for Commodore owners who may wish to change later. State Parallel/Centronics, Commodore, or IBM cartridge, when ordering.

### THE star PRINTERS FOR BUSINESS — NX-15

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Wide carriage version of the NL10, similar features and same high quality with 134 column capability.

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### THE star PRINTERS FOR BUSINESS — POWERTYPE DAISYWHEEL PRINTER

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- **Switch selection of options**

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DON'T FORGET ALL PRINTER PRICES INCLUDE VAT, CARRIAGE AND CABLE

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| | |
|---|---|
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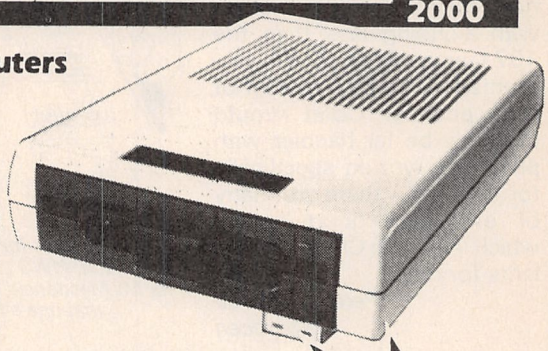
## THE EVESHAM ENHANCER 2000

### For COMMODORE Computers

The Evesham Micros version of this reliable and compact disc drive has a **new ROM** to ensure a **very high** degree of compatibility with disc turbos and protection schemes.



**FEATURES**

- ★ **Handles Disc Turbos**
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**IMPORTANT: ONLY THE EVESHAM MICROS VERSION OF THIS DRIVE HAS THE NEW ROM THAT WILL HANDLE DISC TURBOS AND LOAD OVER 98% OF PROTECTION SCHEMES.**

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**THREE PURCHASE OPTIONS —**

**OPTION 1** Evesham Enhancer with free s/ware. **ONLY £149.95**

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|---|---|
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| | |
|---|---|
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| | |
|---|---|
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| **Cumana 1mb single** | **£155.00** |
| **Cumana 2mb double** | **£249.00** |

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**AMSTRAD 1512 – most models now in stock.**

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| | |
|---|---|
| **ASCII PC Compatible 640K twin drive** | **£425.00** |
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**HARD DISK**

EASYCARD drive on a card suits Amstrad single- or twin- drive models. 20mb storage. Easy installation and highest quality (as used by Compaq) **£499.00**

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|---|---|---|
| **3"** | Box of10 | **£29.00** |
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| | 25 disks as above with 50 capacity lockable box | **£22.95** |
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| | 50 capacity lockable box | **£10.95** |
| | 100 capacity lockable box | **£13.95** |

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This kit with **ultra detailed fitting instructions** will allow you to expand the memory of your 1512 to 640K. That extra memory is really useful when using GEM and it really is straight forward to fit.

Only **£27.00**

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All items subject to availability, E.&O.E. Orders from Government and Educational departments welcome. Goods shipped anywhere within Europe at advertised price.

# Revelations about Spellbound

*Tony Kendle with another week's worth of letters, pokes and tips for games fans*

Now for those who believe that we really must have said everything there is to say about the Magic Knight game *Spellbound* here is a revelation in the form of another letter from Adam Mayer from Liss in Hants.

"The key came when I realised that the four leaf clover was in fact a good luck charm," (yes it seems obvious to me as well), "but I was led astray by some of the people in your magazine who said that you need the rune stone – you don't at all!

"To light the candle you need the shield and the four leaf clover. Drop the clover, hold the shield and pray – Bang! one lighted candle. After that everything went fine until I tried to free Gimble.

"You need Orik (learning magic by post) to hold the crystal ball, then throw all three crystals at Gimble to give him one big headache. After that you cast the release spell. Then I found you had to go up to the gallery and in the room where the picture of the sea and castle is. Then you call in the characters in the reverse order of the pictures in the gallery, from Elrand to Gimble.

"Keeping up with arcade adventures, can anyone help with *That's The Spirit*? So far I have the following objects; ash tray: sleeping tablets; key for church; telecomputer; A thing with 'HI' on it that you can eat; tape; bone; guide to New York – if you read it you get a ferry ticket; gun and reactor; sandwich.

"So far I have managed to throw the bone at the dog, swear at granny, and spray the ghost using red paint and the squirter. How do you get rid of the cat and the phantom? Also what do I do on the computer? I've typed help and it says 'At line 150 bad line'.

"What do I do? On the high score table I have topped AC13 'Thing on key' but before it came FLT, AC13 then my score – what happened? Is this a clue?

On the Firebird game *Mega Bucks*, which is like an exact copy of *Spellbound* at £1.99, windows and all. I have reached 95% but am now stuck. How do you open the cemetery door?

"Finally can you please get more information from David Jones about *Stormbringer* and the progress of the other versions."

Thanks for the letter Adam. I hope some of our readers can help.

My own particular sleep stealing arcade advernture at the moment is the game *Sceptre of Baghdad* by Atlantis Software,. How the times have changed – this is very similar in feel, and easily as good as, the Wally Week games yet here it is selling as a cheap release. If anyone has the solution – please send it in.

I want to finish this week with a tip from Mahesh Patil, also known as Mac, who has sent in this particular piece of good news for Commodore owners regarding the brilliant arcade effort from the Gargoyle team in Dudley.

"Looking through some back issues I saw a poke for *Lightforce* and a request for other versions so I decided to try a quick hack.

"Load the game and reset it. Now type

```
POKE 14235,234
POKE 14236,234
POKE 14237,234
```

and then SYS 2061 to restart the game.

"You will now continue to have five lives even if you get killed. The pokes simply cancel the routine which decreases the number of lives by replacing the machine code commands with NOP(No Operation i.e. do nothing) statements."

Which reminds me that it is high time we got back to our occasional series intended to teach the skills of hacking to beginners. Anyone who finds certain aspects of the whole process of putting in pokes, or finding cheat routines, impossible to follow please write in. I want to hear exactly what you find difficult, and what you would like to know.

I must make the usual proviso that we can't go into detail about breaking software protection routines but many programs released today do accept that these are pointless when tape to tape copying is so easy so we will still have plenty of games to choose from.

If any experienced hackers also have any comments to make, please do not hesitate to get in touch.

```
5 REM . . CHOPPER SQUAD Number of lives
                        By L Cowley
10 INPUT "Enter number of lives 1-255 ",
num
20 BORDER 0:OPENOUT "":MEMORY 999:CLS:LO
CATE 10,10:PRINT "Loading Please Wait":L
OAD "!CODE1",6000:GOTO 70
30 POKE 6006,locn-256*INT(locn/256):POKE
 6007,INT(locn/256)
40 POKE 6008,lenth-256*INT(lenth/256):PO
KE 6009,INT(lenth/256)
50 POKE 6010,69
60 CALL &BC6E:CALL 6000:CALL &BC71
70 RETURN
80 DATA 1000,5000
90 DATA 10000,16384
100 DATA 29816,14336
110 RESTORE 70
120 FOR n=1 to 3
130 READ locn,lenth:GOSUB 20:IF PEEK(601
1)<>0 THEN PRINT "LOADING ERROR. . . Ple
ase try again.":STOP
140 NEXT
150 POKE 1766,num:CALL 1000:STOP
```

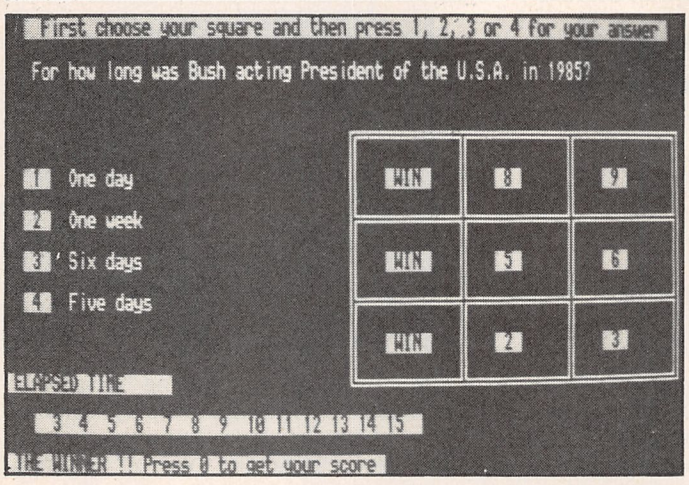
## Charts

### Top Twenty

| | | | |
|---|---|---|---|
| 1 | (1) | Feud | Bulldog |
| 2 | (2) | BMX Simulator | Code Masters |
| 3 | (4) | Gauntlet | US Gold |
| 4 | (6) | Paperboy | Elite |
| 5 | (7) | Footballer of the Year | Gremlin Graphics |
| 6 | (3) | 180 | Mastertronic |
| 7 | (9) | Ninja | Mastertronic |
| 8 | (11) | Konami's Coin-op Hits | Imagine |
| 9 | (12) | Ollie and Lisa | Firebird |
| 10 | (8) | Curse of Sherwood | Mastertronic |
| 11 | (10) | Leaderboard | Access/US Gold |
| 12 | (14) | Computer Hits Vol 3 | Beau Jolly |
| 13 | (5) | Bomb Jack 2 | Elite |
| 14 | (–) | Big 4 | Durell |
| 15 | (19) | Hit Pack | Elite |
| 16 | (18) | Gun Law | Mastertronic |
| 17 | (16) | Park Patrol | Firebird |
| 18 | (20) | Five Star Games | Beau Jolly |
| 19 | (–) | Escape from Singe's Castle | Software Projects |
| 20 | (–) | Short Circuit | Ocean |

All figures compiled by Gallup/Microscope

# 1,000 questions




*Micro Trivia* is the latest in the crowded computer quiz field, boasting a bank of 1,000 questions.

The program follows a slightly different format to *Trivial Pursuit*, but one similar to the coin-op machine versions of the game.

You play the game as a type of noughts and crosses. Select a square, answer the question correctly from the multiple choice selection and the square fills with a 'win'. Get it wrong and you score a 'loss'. The idea is to get three wins in a row, horizontally, vertically or diagonally.

In the coin-ops, this may get you your money back. In *Micro Trivia,* you get a "fun IQ score", and if it's high enough, your name on the "victory parade".

Of course, the IQ scores have everything to do with the speed and accuracy of your answers, and nothing to do with intelligence. Just as well, really, since the 'fun IQs' of the Popular office have ranged from –10 to 387.

In addition to this, *Micro Trivia* is offering the chance of winning a cruise down the Nile for high scorers who complete a limerick most inventively.

The original disc contains "general knowledge" questions, according to the inlay, although in practice these are almost solely about historical/current affairs. Further discs on subjects including sport, soap opera and pop music are available from the publisher.

The IBM PC version of *Micro Trivia* also contains that well-know gimmick, the pop-up pseudo word processor screen for playing the game at work.

It's hard to think of anything either positive or negative to say about *Micro Trivia.* The on-screen presentation is utilitarian, without any of the nice graphic touches which ODE/Domark were able to add to the *Trivial Pursuit* licence, the questions on the original disc are of the sort where you need to know your dates, and in some cases, statistics, but I haven't yet come across any snippets of wisdom of the 'fascinating but useless" variety which the first trivia quizzes were all about.

So, it's perfectly adequate, but with the questions in the first pack all being much of a muchness, it's not going to hold the attention for that long.

**Popular Appeal ♦♦**

**Christina Erskine**

**Program** *Micro Trivia* **Micros** IBM PC compatible, Spectrum **Price** £19.99 **Supplier** Harold Gale Associates, Bond House Street, St John's Square. Wolverhampton, West Midlands WV2 4AH.

# Coaster's clear

Budget games are the ideal excuse for mindless violence without the distraction of any unnecessary plot. *Solar Coaster* (clever title) is a hybrid of *Galaxions, Zalaga* and *Phoenix* which is fast, colourful, and violent enough for any Amstrad headbanger.

Optyx is a new name to me, and although *Solar Coaster* is way down in the low nothings as far as originality goes, I look forward to seeing more of the company's games.

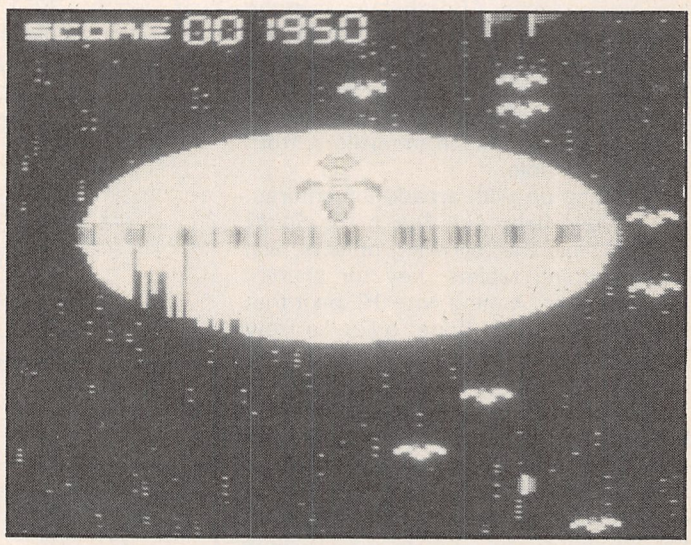
While the first three screens of aliens are fairly easy – you don't even have to move off the bottom of the screen to finish them off – things get more difficult later on. First you have to destroy the giant egg-shaped mother ship, blasting the guard fighters, then cutting through the bottom of the ship; then the second phase starts, and things get nasty as swooping lines of aliens force you to abandon the bottom of the screen, and thrust out to where no being has gone before.

Some excellent spot effects, particularly the space-searing explosion when you die; rather annoying sound effects, but that's what the volume dial is for, isn't it? Otherwise, a little gem.

**Popular Appeal ♦♦♦**

**Chris Jenkins**

**Program** *Solar Coaster* **Micro** Amstrad CPC **Price** £1.99 **Supplier** Optyx Software, New House, Stoney Street, Madley, Hereford HR2 9NJ.




# They win, Zulus

When Britons ruled the waves, upper lips were permanently stiff and the playing fields of Eton were considerably greener than they are nowadays. In those days of Empire, we tended to go around places and kick the hell out of the natives – *Zulu War* is a simulation of one of these incidents.

The British armies are hugely outnumbered, and there are times when you wonder exactly where these black hordes are coming from, as you manoeuvre your regiments around the map, attempting not to get surrounded.

The game system is simple, if anything too simple for the hardened gamer, but this means that it would be suitable for any wargaming beginners.

The tactics you must employ, too, are fairly basic – but with three levels of difficulty on the main game *(Ulundi),* and a second game on the flip side of the tape, you should get a fair amount of mileage out of this one.

**Popular Appeal ♦♦♦**

**John Cook**

**Program** *Zulu War Machine* **Micro** Spectrum **Price** £9.95 **Supplier** CCS, 14 Langton Way, London SE3 7TL.

# MASTERFILE 8000

FOR ALL AMSTRAD PCW COMPUTERS

**MASTERFILE 8000**, the subject of so many enquiries, is now available.

**MASTERFILE 8000** is a totally new database product. While drawing on the best features of the CPC versions, it has been designed specifically for the PCW range. The resulting combination of control and power is a delight to use.

Other products offer a choice between fast but limited-capacity RAM files, and large-capacity but cumbersome fixed-length, direct-access disc files. **MASTERFILE 8000** and the PCW RAM disc combine to offer high capacity with fast access to variable-length data. File capacity is limited only by the size of your RAM disc.

A MASTERFILE hallmark is the provision of multiple, user-designed display formats. This flexibility remains, but now it's even easier. With **MASTERFILE 8000** you design your formats "live"; no more questionnaires, just move your format effects around the screen using the cursor keys!

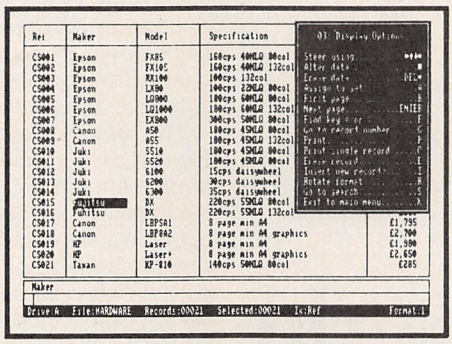
Record updating is even easier than before — just steer your cursor to any field on the screen and then insert/erase/alter as required.

Special options are provided for handling dates and surnames, and column totals can be generated.

All screen work is done graphically — and hence we offer unique panel, box, and ruled line options. Choose the line spacing at pixel resolution — you will be amazed how much clearer 9-pixel lines are than the usual 8-pixels. (Study the picture.) And all this faster than CP/M normally lets you paint the screen! PCW printer functions, under menu control, are provided.

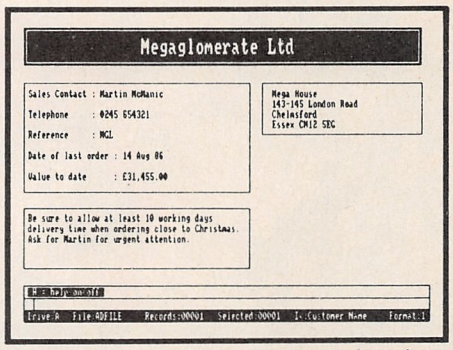
Keyed files are maintained automatically in key sequence, with never any need to sort. You can have unkeyed files too, where records can be inserted at any point in the file.

Any file can make RELATIONAL references to up to EIGHT read-only keyed files, the linkage being effected purely by the use of matching file and data names.




You can import/merge ASCII files (e.g. from MASTERFILE III), or export any data (e.g. to a word-processor), and merge files. For keyed files this is a true merge, not just an append operation. By virtue of export and re-import you can make a copy of a file in another key sequence. New data fields can be added at any time.

File searches combine flexibility with speed. (**MASTERFILE 8000** usually waits for you, not




the other way around.) You can even assign subsets of a file into one or more of seven pigeon-holes for subsequent reference or further manipulation.

**FIELD-TO-FIELD CALCULATION** is available, using any mixture of terms and arithmetic operators + — * / ( ).

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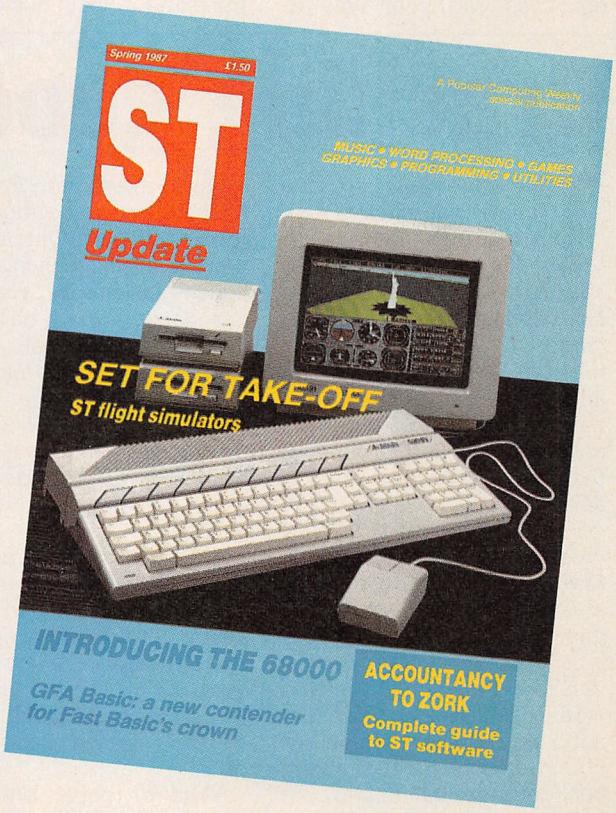
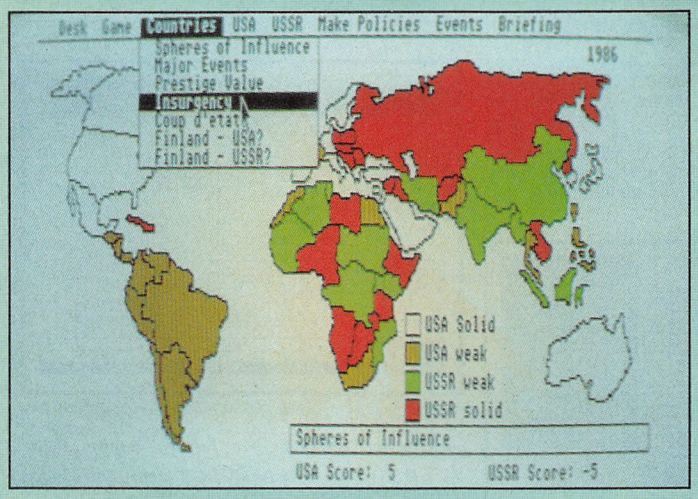





# The murky world of geopolitics

If you ever wondered why the Americans don't send troops into Afghanistan to help the Mujahedin, try playing *Balance of Power* and see what happens. This Mindscape game, previously out on the Mac and Amiga and distributed by Mirrorsoft, allows you to enter the murky world of geopolitics as you attempt to subvert and cajole countries into your way of thinking.

For an eight year span of history, 1986–1994, you play the part of the President of the United States or the Premier of the Soviet Union, either against the computer or another player. The basic objective is to keep the world intact and to have scored more prestige points than your opponent at the end of the game. Should nuclear war break out, and it often does, everyone loses.

The way to score prestige points is to convince the computer, in a crisis, that you really would press the button to blow up the world. To be convincing you must have various factors in your favour to back up your argument. To back down in a major crisis costs the loser prestige and influence around the globe.

The options available, on Expert Level, include shipping arms, sending out troops (always provocative), supplying economic aid, destabilisation, treaties and diplomatic pressure. Whilst not being particularly complicated, *Balance of Power* is extremely complex in the way that all the various factors and world opinion of the two sides are considered.

The price may be high (and winning is very difficult), but then the best always costs more, and *Balance of Power* is simply the best strategy game out on the ST.

**Popular Appeal ♦♦♦♦**

**Duncan Evans**

**Program** *Balance of Power* **Micro** Atari ST **Price** £45.95 **Supplier** Mirrorsoft, Maxwell House, 74 Worship Street, London EC2A 2EN.

# Delving

Ta-ta, Terra. The Hsiffies are hissed off that nobody can pronounce their name and so the buck-toothed buccaneers are after earthling guts. Luckily there is always the Damocles team, that elite squad which you joined many moons – not to say a few beers – ago. So grab that joystick – it's blastin' time!

It's been a long wait for the sequel to *Sanxion,* and once again the fiendish Finn, Stavros Fasoulas – which is also a bit of a mouthful – has gone for the classic shoot 'em up format. And once again he's produced a classic. If you liked *Sanxion,* you'll flip over the follow up.

The time has been well spent because this is one of those rare programs where everything adds up. The blasting is well balanced, with the waves of fighters following just the right flight patterns. Life is difficult, but not quite impossible, once you learn the ropes. There's no sign of that curse of lesser games of frantic firepower either – too slow responses. Just keep your finger on the trigger and go for it.

# Cracking good!

The old ideas are the best, they always say, although what do "they" know about it? The resurgence of ancient classics like *Breakout* and *Defender,* thinly disguised as the modern versions *Arkanoid* and *Nemesis,* baffles me; there must be more original concepts floating around in the ether for fertile minds to seize upon.

Having said that, as a 1987 version of *Breakout,* Gremlin's *Krakout* has its moments. For a start, the format of the game is almost infinitely variable. The intro screen allows you to adjust the side of the screen on which your bat appears, whether music or sound effects play, scrolling backgrounds, ball speed, bat speed and so on.

Once the game starts, you soon realise that there's a lot more to this than to *Breakout.* Bashing away at various patterns of bricks is just part of it; there are aliens flying about which can freeze your bat, introduce an extra ball, swallow the existing ball, and so on. It's up to you to learn how to use them.

There are also bonuses to be gained from hitting certain bricks; an expanded bat, extra lives, smart bombs and such.

*Krakout* is a very polished program, with plenty of speed, colour and good sound and graphic spot effects. It's also deliberately devoid of rubbishy scrolling messages and "I love Tracy" displays, which is all to the good.

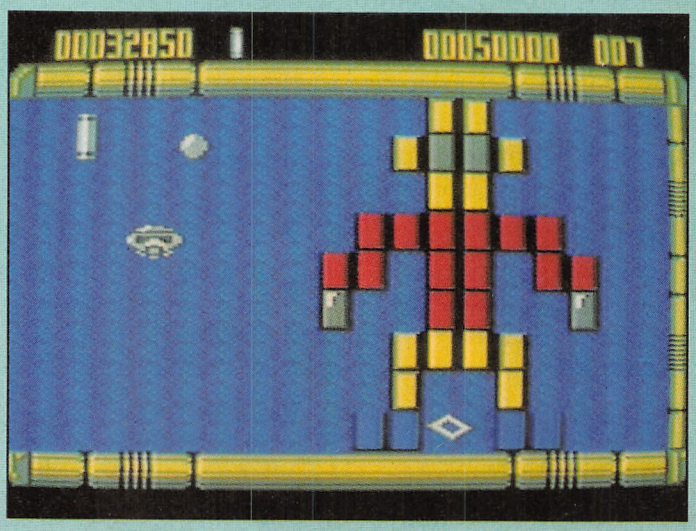
What's more, once you have mastered the 100 screens, you can play another set or design your own with the optional *Construction Set* at £4.99 (£7.99 disc).

It all boils down to whether you enjoy the original *Breakout* concept, or feel that smacking a ball at a wall of coloured bricks smacks too much of "ping-pong" TV consoles. If you're not old enough to remember that era, then *Krakout* will probably strike you as fresh, new and exciting.

**Popular Appeal ♦♦♦♦**

**Chris Jenkins**

**Program** *Krakout* **Micro** Commodore 64 **Price** £9.95 tape, £14.95 disc **Supplier** Gremlin Graphics, 10 Carver Street, Sheffield.



# into Delta

There's also a strategic element, which is guaranteed to keep you on your toes. After every wave of fighters come the floating paving stones. Each one contains the sort of add-on that no smart space cookie would want to be without. All you have to do is score enough credits and one or more of these will turn pale blue, which means that you can pick it up by flying over it.

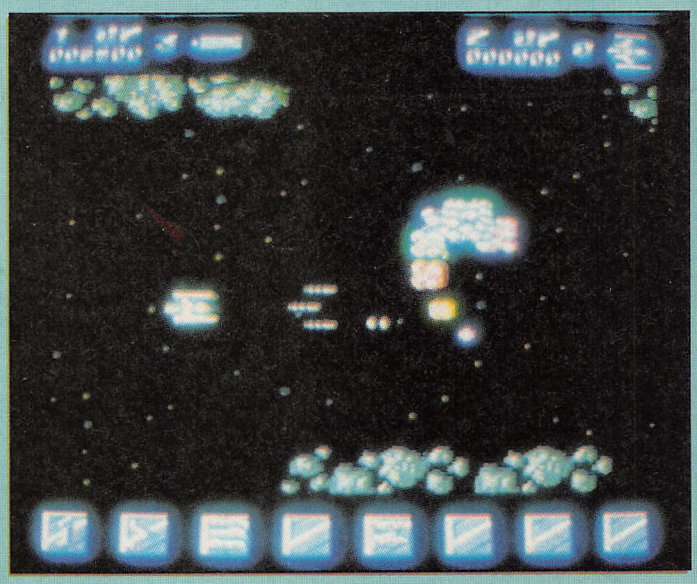
But it isn't quite so easy, because the slabs' benefits have a limited life and fade away. Which means you need to pick your peripherals wisely. Beware, also, of waves of Hsiffies which remove credits. This won't tax the true psychopaths too much, but the brainwork is a welcome element in a game of mass destruction.

The final things that make *Delta* the mega-deltoid flexing challenge that it is, are the music and graphics. Aliens as brightly coloured as fireworks streak towards you while collisions resound through space. But best of all is the Philip Glass goes hip-hop theme tune – one to play at parties.

In the interests of adrenalin production, do yourself a favour and buy *Delta*. It's a blast!

**Popular Appeal** ♦♦♦♦♦
**John Minson**

**Program** *Delta* **Micro** C64 **Price** £9.95 **Supplier** Thalamus, Front Office, 1st Floor, Advance Works, 44 Wallace Road, London N1 1PQ.



# Heady stuff

The brains of Jon Ritman and Bernie Drummond must be decidedly odd! Remember all those warped monstrosities in *Batman?* Well, now they've gone for total weird-out, with two spherical dogs seeking doughnut ammunition and . . . you see what I mean?

At first sight there's a temptation to consider *H Over H* a mere clone of their earlier triumph – after all Head and Heels do look like second cousins to the evil dogs who bugged the Batty one. But once you've gone through the initial routine, to set sound, difficulty levels and controls, it becomes obvious that this is something completely different.

After all, while the man with blue undies over his tights was all alone, these two canine saviours of the universe have to co-operate if they're to overcome the evil Blacktooth Empire – and that's the whole tooth and nothing but the tooth. The problem is that, at the start, they're separated by a fence which is too big to bounce over.

Caped Crusaders will recognise one or two of the problems though, which should be enough to get them into a situation where Head can collect his ammo and Heel pick up a purse. Jumping on to the teleports gets you out of the rooms, but then there are conveyor belts and exploding floors to handle. Look for control systems and be patient is my advice.

In these early stages at least, there's less dodging than in *Batman,* but you'll still need those nifty jumping skills. The thing to remember is that if you keep your finger pressed on a direction key while in the air, you'll float in that direction, which means you can make long, short and even sideways leaps.

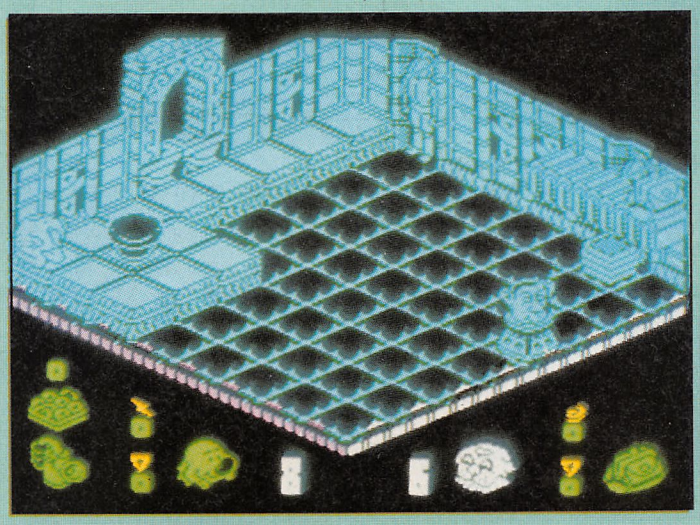
Once you've reunited the two mutts they will act as a dynamic duo. Of course, there is the option of scarpering to safety, but being heroes, they'd do better to take on the evil empire single-handedly . . . or should that be double handedly? Anyhow, as each of them possesses different skills, there will be plenty more problem solving before the universe can sleep safely.

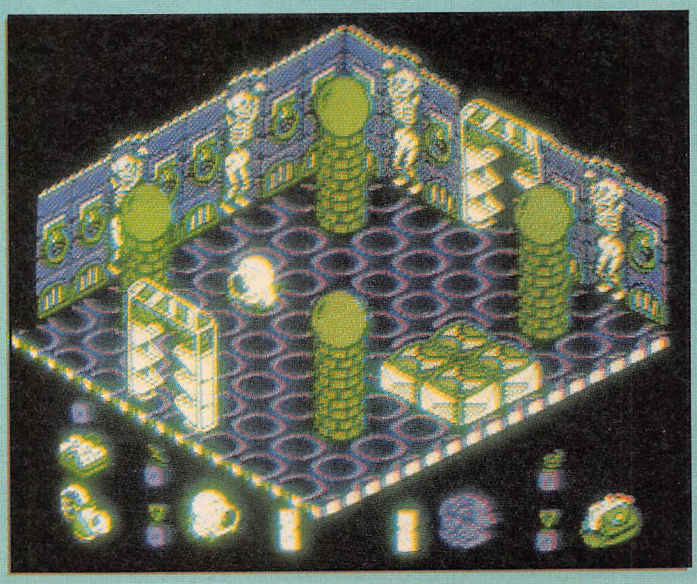
It's almost impossible to fault this game. Head and Heels are chubby and cute, and the decorator responsible for the decoration of Castle Blacktooth has a fine way with evil interiors.

So I'm left with only one reservation about this topsy-turvy arcade adventure – what is going on in the minds of Ritman and Drummond . . . and what will they come up with next?

**Popular Appeal** ♦♦♦♦♦
**John Minson**

**Program** *Head Over Heels* **Micro** Spectrum 48K/128K, Amstrad CPC **Price** £7.95 Spectrum, £8.95 Amstrad **Supplier** Ocean, 6 Central Street, Manchester M2 5NS.





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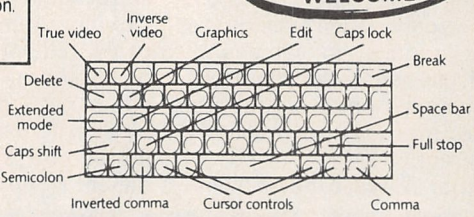


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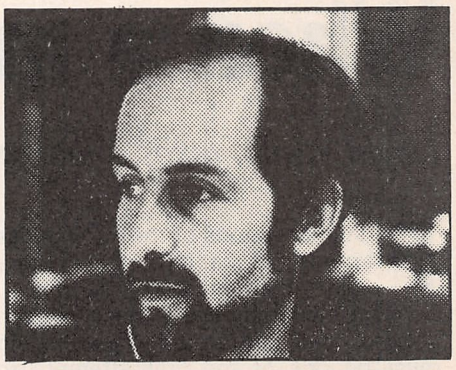
# Helping out with the hints



*Tony Bridge comes clean on the Mega-Hints and offers advice on other games*

First of all, some welcome news for those of you who may have sent games off to Central Solutions. One or two letters have reached me from readers who seem to have lost their tapes since this company went quiet, and now I am pleased to report that Sandra Sharkey of *Adventure Probe* appears to have found some of them! If you've recently sent your adventure off to Central Solutions and heard no more, then drop Sandra a line at 78 Merton Road, Wigan WN3 6LS – no promises, but she might just be able to match you up with your game.

Now, I hang my head in shame: yes, some of you may have noticed that the Grand Elf's "Mega-Hints" (*Popular,* 19 February) were a bit too mega even for him – Mr G Wardle of Hyde took me to task over some of the clues to *Red Moon,* which were oh-so-cunningly disguised as clues to *Snowball* (of course, only the Ramp is relevant to this game; the forge and so on belong in *Red Moon*). Mr Wardle was the first person to spot this, and so win the first prize which is help in the mazes in *Colossal Cave.*

The first maze, with "passages all the same" need only be entered if your treasure has been purloined by the Pirate, who will have whisked it off to his chest in the maze. Although you can enter the maze from two locations, initially go south from the west end of the Hall of Mists (you can also go Down from the Stalactite near Bedquilt, but you'll find that you can't return Up – the advantage of the other entrance is that if you change your mind, you can simply retrace your steps North). Now go E,S,S,S,N,E,E,NW. Here you'll find the Pirate's chest, although the location will simply be a Dead End if he hasn't appeared yet. Having dealt with the chest, proceed SE, N and finally Down to the Splendid Chamber.

The "Different Maze" is different (ah, the Knowledge of the Ancients for 50p a week . . .). This contains a Vending Machine which will come in handy when your lamp begins to wane – at the west end of the Long Passage, go S then Climb, then once finished with the Machine, go N, and Up.

Oh, and if you think that you might now be out of trouble, I've got news for you; there's a *third* maze in the Cave just waiting for complacent adventurers . . .

But I did get *something* right in the MegaHints Supplement – oh, all right, I'll come clean! Mr Wardle found me out again. The *Red Moon* clues I managed to get in the right place were not entirely adjacent to the truth – in fact, I said that you shouldn't enter the Room of Mirrors, but of course you can, *if* you use a bit of cunning. So, take the Ring, the Potion, Armour, Weapons (not Magic) and the Mushroom to the entrance of the room and then drop them all. Make sure that your stamina is as low as possible and eat the mushroom to reduce your height. Why do all this? Because when you enter, your reflection assumes all the attributes you possess upon first entering. Now you must dodge the attack of your reflection and exit Southwest. When you return to normal size drink the potion, don the armour, take the Weapon and re-enter. Your reflection will still of course, be a tiny, weedy shadow of your former self and easy to defeat. How simple, and how elegant – thank you, Mr Wardle.

So to *The Pawn,* Rainbird's now-classic release for the QL, Atari ST and all computers south. Many people have been asking help in this one, and David Gordan's plea is typical. I've only seen snatches of this adventure on passing Commodores and STs, and I'm looking forward to receiving my copy of the Amstrad CPC version any day now.

David wants to know how to kill the adventurer, how to pass the guards and enter through the cream doors.

Well, you'll know from the lavish book that comes with every copy (pirates are rather unfortunate in this regard) that a list of encoded clues is included, and you'll also know that the help is only available at the right time and not before. But as this is quite near the start of the game, let me tell you (but if you've been awake, Kronos will also have told you) that you must give the adventurer the chest – as you know, no adventurer worth his salt can resist opening chests, and in this case, a nasty surprise awaits! As for the guards, they are looking for a pass-note (see Kronos). The cream doors, as far as I am aware, are the entrance to the adventure-writer's room, the final location, so I imagine that you have much more to do before earning the right to enter here. Let me know how you get on by which time I will, I hope, have played through to this point myself.

If you're in a position to help David in *The Pawn,* his address is 24 Lambolle Road, London NW3 4PG.

## Adventure Helpline

**San Francisco 1906 on Atari XL.** I've found the dog, apple, gun, hammer and lumber but I can't get any further. Can offer help on Time Machine, Escape from Tromm, Mordon's Quest, Emerald Isle and Dungeon Adventure. Barbara Armitage, 46 Cinque Ports Avenue, Hythe, Kent CT21 6HP.

**Hitchiker's Guide to the Galaxy on C64.** I have pocket fluff, jacket fluff and satchel fluff. Where is the fourth piece? What use is the mineral water? Prosser's watch? The Martian, 40 Westbury Mount, Hunslet, Leeds LS10 3DB.

**Return to Eden on Amstrad.** How do I get past the Leviathan? What is the bird for? David Litherland, 1007 Chorley Road, Lostock, Bolton Lanes BL6 4LW.

**Ali Baba and the Forty Thieves on Atari XL.** I cannot find the princess – can anyone help? Mark Cox, 5 Acacia Avenue, Chapeltown, Sheffield S30 4PQ.

**Ultima II on Atari XL.** I cannot raise my character powers, I can't find the cards or the exotics. Mark Cox, 5 Acacia Avenue, Chapeltown, Sheffield S30 4PQ.

**Pilgrim on C64.** How do I get through the wall of rock and what are the axe and lens shade used for? M. Lester, 43 Margaret Road, Kettering, Northants.

**The Helm on C64.** What are the haystack, box, mirror, bulb and gramophone used for? M Lester, 43 Margaret Road, Kettering, Northants.

# When a man loves a modem

*David Wallin takes a look at Modem House's new Series 4 modems*

First impressions of the Pace Series 4 modem is that it looks a lot more stylish than most 'black boxes'. Series 4 modems have a special wedge shaped case, are cream coloured and must be one of the first attempts to produce a modem that actually looks attractive.

Perhaps more importantly, they are probably the best home and small business modems on the market (and possibly, that plastic case would not stand up to school or industry use very well).

The now defunct Scitek-Future Science and Technology (Modem House to you and me) had planned, and was ready to launch, its Discovery range which would compete with the Series 4 on specification and price. Whether Discovery will now appear under another name is unclear, which leaves the Miracle Technology WS3000 as the only real competitor for the Series 4, and personally I think the style and extras on the Series 4 make it a superior modem. Compared to Pace's first modem – the Nightingale, which I was unimpressed with, the Series 4 is a big step forward and should be a great success, especially as the top two modems in the range recently came down substantially in price (bottom of the range is still selling at £265).

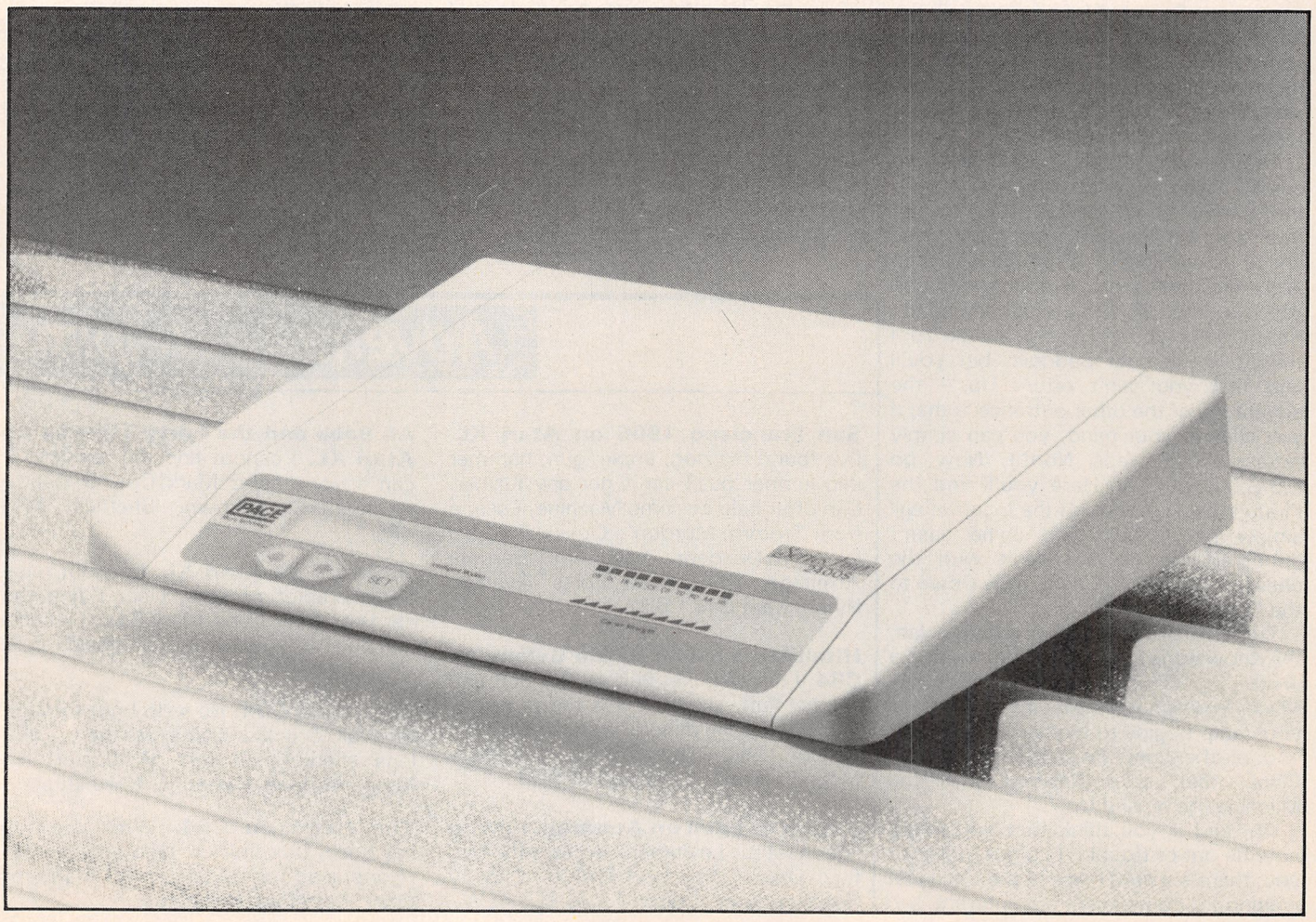
*"The whole standard Hayes command set is supported – the UK version allows for 1200/75 and 75/1200"*

The modem itself performs very well. It filters and then amplifies the incoming signal to produce a strong and clear reception. The cheapest, bottom of the range version has 300/300, 1200/75 and 75/1200 speeds (the model 2123S), the 1200S has the addition of 1200/1200 full duplex and the 2400S has also 2400/2400. Impressive you might think. And for this country it is, though in America 2400/2400 is commonplace with 4800/4800 being the top modem speed.

Auto answer and dial are naturally standard as is baud rate scan (very good too – it has never gone wrong on me and picked the wrong baud rate).

As I mentioned before, there is an internal 64 number telephone directory which is backed up by the same batteries which supply the clock (the battery automatically recharges while the modem is connected to the mains. These numbers can be dialled from the computer with the Hayes command *AT D Nn (where n is from 0 to 63)*. Each number can have a description of up to 16 characters long so most BB names should fit on.

The whole standard Hayes command set is supported (the UK version which allows for 1200/75 and 75/1200) with an extra 14 commands available. These cover the 64 number store, unattended



mode and time/date facilities. The internal clock on the Series 4 is very accurate and the date seems to handle things like leap years without any trouble. The date can be sent to the computer in reply to the command *AT K*. This could be used to set a computer's internal clock fairly easily which is useful on many computers which do not back up their clocks.

When you turn the modem on at the mains, or after a power cut, it performs a self test to check it is OK. It should display a message like:

*Series Four*
*ready*

provided all is OK. After about three seconds the message goes and the familiar time and date appear and the modem is ready for use. If you press reset while the modem is showing the above message, it will re-perform the self test.

I have used the modem for Prestel, other Viewdata systems, Telecom Gold (at 1200/1200), PSS and many Bulletin Boards with no problems.

The manuals deserve a mention as well. A smart, black plastic, loose leaf ring binder holds a quick reference card, an installation guide and a loose leaf manual. The quick reference card lists the Hayes commands on one side and the most common 'S' registers and information on the Result Codes (error messages, etc) on the other. The installation guide basically tells you how to set up the modem and gives a small amount of information to the user. The main manual is concise despite its length, informative and fairly simple to understand. Overall, in all three, there is a lot of good manual to read and, indeed, some other modem manufacturers would be advised to read them.

The front of the modem has a 2 line × 16 character LCD screen. There are also three touch sensitive buttons and 20 status LEDs. The LEDs are split into two rows of 10 LEDs each. The bottom row contains 10 triangular red LEDs which are used to show the carrier strength, ie, the strength of the carrier on the line. This generally stays around the O 18 mark, but it can be lower which suggests a bad and quiet line on which radialing is advisable, especially if you wish to perform up- or downloads. These LEDs also 'flash' as the call is dialled and the phone on the other end rings. The top 10 LEDs show:

ON – power on
OL – on line
TR – data terminal ready
RS – request to send
CS – clear to send
CD – carrier detect
TD – transmit data
RD – receive data
AA – auto answer
HS – high speed (1200 or 2400 speed in use)

## Series 4 modem features

Multi-speed
Autodial
Autoanswer
Hayes Compatible
LCD display (2 lines × 16 characters
Battery backed clock and calendar (displayed on LCD display)
20 status LEDs (10 for carrier strength)
Dial number, Set S register, volume etc, without being connected to computer
Tone (DTMF) or Pulse dial
Three slimline buttons on front (← → SET)
Reset button (on back)
25-way 'D' female RS232 port
Power cable with transformer on plug (lead is far too short though)
Printer port
Telephone through connector
BT approved
REN = 1·5 (total REN on a phone line should be under 4)
54 number telephone directory
Internal loudspeaker
Auto re-dial of last number
Outgoing call monitor (ringing, engaged, etc)
Quick reference card (simple but very useful addition)

| Model | Speeds |
|---|---|
| 1223S – | V21 and V23 (300/300, 1200/75, 75/1200) |
| 1200S – | V21, V22 and V23 (as above and 1200/1200) |
| 2400S – | V21, V22, V22bis and V23 (as above and 2400/2400) |

| Model | Price |
|---|---|
| 1223S – | £265 |
| 1200S – | £399 (was £479) |
| 2400S – | £499 (was £619) |

These LEDs are useful, but the average user won't use many (ON, OL, TD, RD, and maybe AA and HS). For an experienced user, these LEDs are invaluable for monitoring how your call is going. Full use of all 10 is explained in the manual.

The three touch buttons are used in conjunction with the LCD display to dial a number (can be a vocal call – the computer need not be connected), set an S register, set the LCD contrast, set the speaker volume, set the time and finally the date. These three are very useful and make the Series 4 into *more than* just a modem. You can store 54 telephone numbers in the modem and dial any one quickly. Also the LCD shows the time and date which is a very useful desktop aid.

The rear of the Series 4 boasts a reset button, a standard (25 way female 'D' style) RS232 port, a printer port, a power input, telephone lead and a telephone through connector.

The printer port – another of the Series 4's special features – allows for a special type of auto answering. A Centronics interfaced printer is connected to the modem, which is left in unattended mode and when a call is detected, the caller will be logged on and able to type in a message which will be printed out to the printer. The modem can also be left with a couple of lines of text to greet a caller with. Put simply this is the modem's answer to a telephone answering machine.

One thing this 'unattended' modem can be used for is if you run a BB, and it is off-line for some reason, then you can leave a message saying why and invite users to leave you any messages, comments, etc, which can be printed out.

Another use of this mode which I believe is on its way is to use the Series 4 and printer as a full telex machine, but I have no details of this.

Now on to a criticism. The power cable plugs into the modem via a 5-pin Din socket. The cable is supplied with a transformer and built in plug on one end and the 5-pin Din on the other. Unfortunately the two are less than 3 feet apart. This means that I sometimes have to place the modem under my desk on a shelf so that it can reach the power supply. This is such a minor problem but is so infuriating (and so common with computer hardware).

However, there is no such problem with the telephone cable which is about three or four metres long and easily reaches the wall socket (even with the modem on a shelf under the desk). A through connector to let you use a telephone without buying a splitter is supplied.

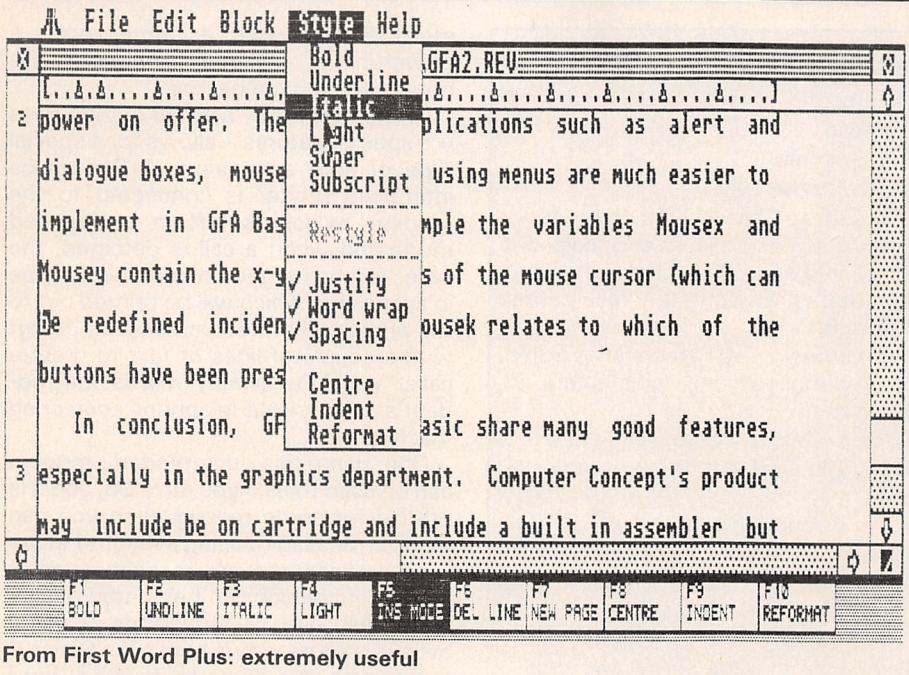
A telephone can be connected into the back of the modem (standard connection) and when the modem is not in use the phone may be used. The second the modem begins to dial or takes over the line, the rear phone port is cut out which prevents any noise getting in from the telephone itself.

To use the unit to autodial a vocal number, you just press the touch buttons until dialling starts, wait for it to finish, pick up the phone and press the reset button. The call is transferred to the telephone connected through the modem.

All in all, if you can afford a Series 4, it is a very good buy. Improvements are planned which will be offered as upgrades to current owners. The 1200/1200 is probably the best as there are few 2400/2400 services around. If you send long mail, currently at 1200/75 or 300/300 then you may find that the Series 4 with its 1200/1200 full duplex speed can actually save time on each item of mail and save you money – quickly paying for itself.

# Searching perfect proc

*Although there has been an excellent bundled with the STM, it has companies producing other, do the same job. With these one is tempted to ask who bundled version? Here Roger alternatives and con*




From First Word Plus: extremely useful

## First Word Plus

*First Word Plus* is extremely useful thanks to its memory resident spelling checker. This can be used either to check a finished document or as a kind of dictionary that may be browsed through as you type. Being memory resident means it's very fast and being integral to the word processor makes it much easier to use than most checkers. Unfortunately it only detects your errors and unlike some others makes no attempt to correct them for you.

The graphics features of this program are limited to simply importing pictures from other programs and inserting them into your text. There are no facilities to edit these pictures within *First Word Plus*.

Other differences between this program and *First Word* are really operational improvements rather than new features. They enhance the already excellent user friendly environment, but to my mind should be provided at only a nominal charge as a software upgrade, where applicable, instead of being sold as a stand alone product.

The printer driver software has undergone drastic changes that now give user definable line spacing and the printing of a document whilst editing another. Although this is obviously good news I think there are sufficient 'spooler' programs in the public domain to make the value of this feature in terms of cash rather questionable.

A prompt line above the Gem file selector has been added which provides a useful safety net as it is possible for the program to misinterpret your choice from a drop down menu and therefore perhaps print a file that you wished to edit. A *Goto page number* feature aids hopping around your document.

New formatting commands allow word wrapping by a mixture of hyphenation and padding with spaces. If selected the program hyphenates the last word on the line rather than lines appearing over spaced.

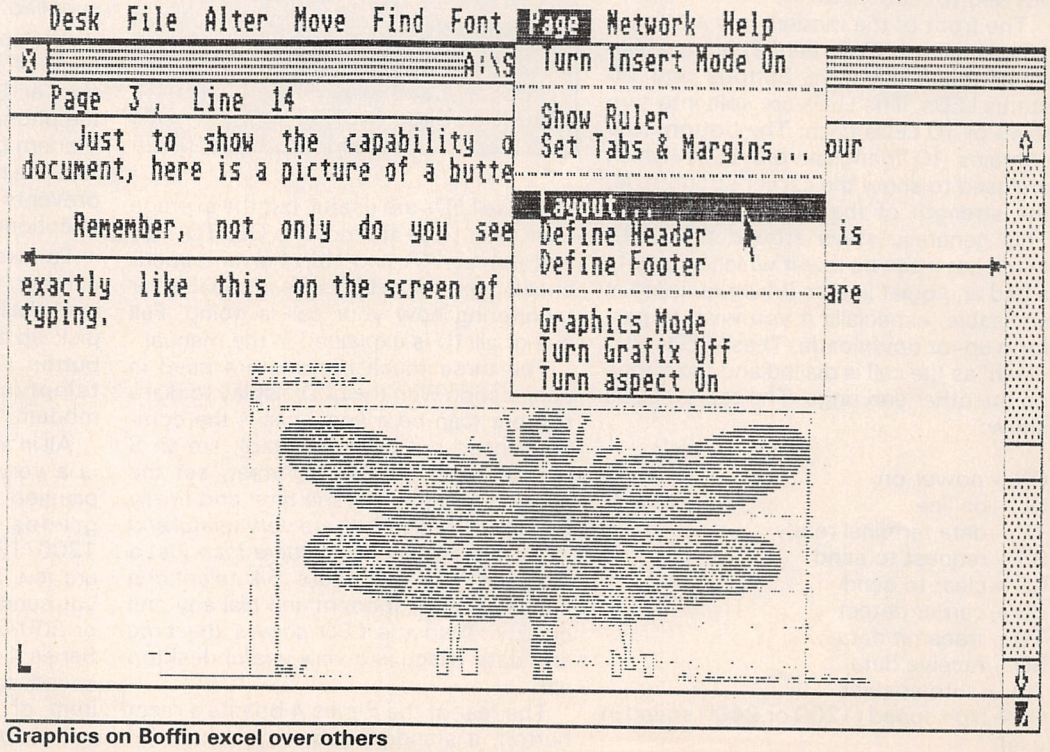
Word count and memory checks give statistics to the number hungry whilst four standard rulers and the ability to write numbered footnotes are further enhancements, it is also possible to reformat the entire document with one command.

## Boffin

Boffin is probably the most versatile word processor available for the ST at the moment. Its strength lies not so much in its *Wordstar* keystroke compatibility nor in its use of Gem, an area in which, if anything it is weaker than most; *Boffin's* strength lies with its integrated graphics capability.

Drawing pie and bar charts is very easy and these can be labelled in a choice of character sizes and angles. If you don't like the normal character set you can define your own, though this may only be used within the graphics editor. Pictures may also be imported from other programs such as *Neochrome* or *Degas* to be included in your documents.

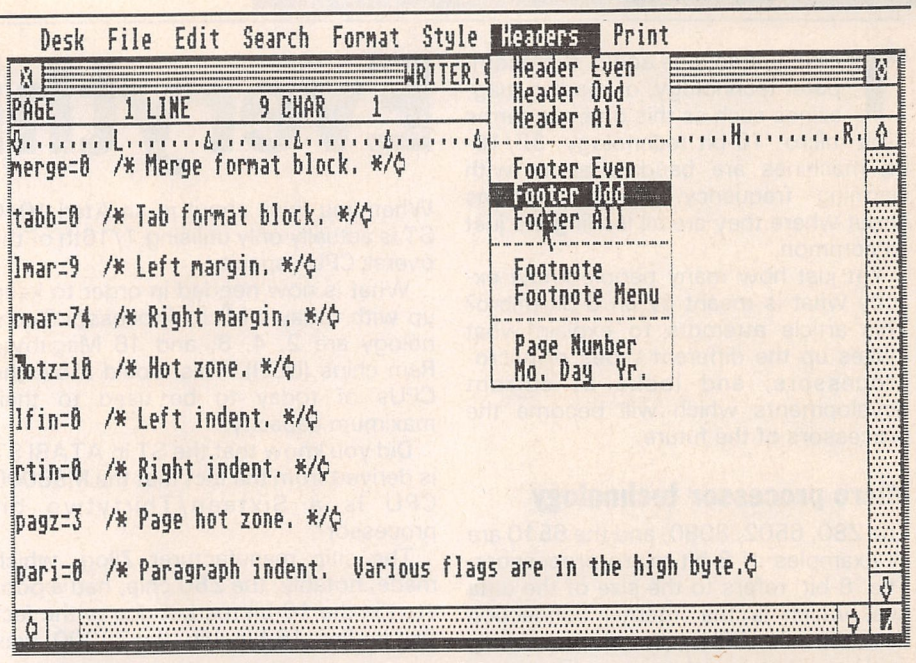
All the standard drawing tools are provided such as circle, line, poly line and so




Graphics on Boffin excel over others

# for the word essor

*word processor,* First Word, *not stopped other software more advanced programs to costing around £100 each, needs them above the Howorth looks at three siders their merits.*

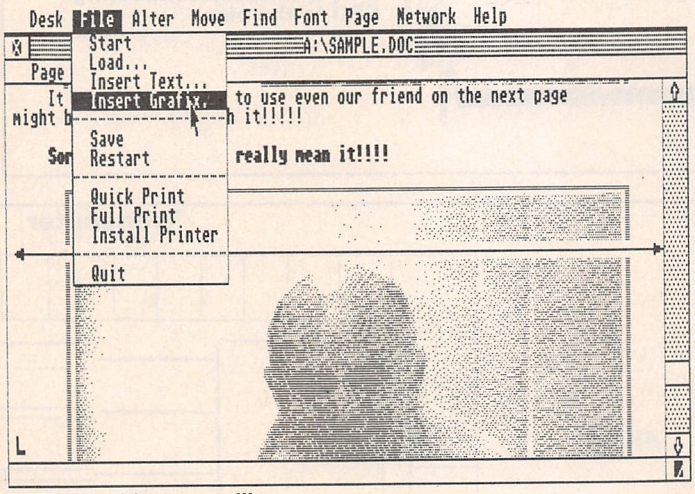



**Haba Writer II – certainly the most powerful**

on. *Boffin* does not provide the kind of technical drawing facility offered by packages such as *Easy Draw,* but it does give a broad and useful every day graphics capability from within a word processor.

My real disappointment with *Boffin* is that it only allows one document to be open at a time, and styles such as italic are only available as a retrospective function, or restyle of your existing typing. These niggles would be more bearable but for a few minor bugs that crop up occasionally which can be infuriating.

Having said this there are areas in which *Boffin* is well appointed or in some cases unique. Printer configuration is taken care of by two comprehensive menu boxes and text headers and footers can be up to nine lines long, and there's a word count function for those fellows who need to know.




**Boffin provides versatility**

## Haba Writer II

*Haba Writer II* is certainly the most powerful word processor reviewed here. It's not that it does anything that the others don't, simply that it does the same things in a more flexible and user defined way. It really is a shame that *Haba Writer II* omits the integral spelling checker of *First Word Plus* and the graphics of *Boffin* – a hybrid of all three would have to be the winner in any contest.

*Haba Writer II* offers almost unlimited flexibility in every function. Most common tasks can be performed from both drop down menus and function keys – in fact, of the 67 menu options, 37 are duplicated with combinations of the function keys and various 'shifts'.

Printing can be performed as either a background or foreground task and there are plenty of functions to tailor the program to your printer.

If you're constantly referring to other documents whilst preparing another you will be pleased to know that up to six text windows can be on screen simultaneously.

There is also a rather unusual 'glossary' function which saves on to disc files of abbreviations for your most commonly used phrases, together with the phrases themselves. In this way, somebody's address could be inserted into a document simply by typing their name. Like its cousins reviewed here, a word count function is also included.

Unfortunately this program is flawed by its virtues: it's so comprehensive that it takes time to learn and understand. If you are a prolific writer, constantly slaving away over a hot ST, you would quickly benefit from this type of program.

However, for many people the facilities in *Boffin* or *First Word Plus* may be more relevant.

## Conclusions

Each of these word processors is an excellent piece of software and each has unique features that suit it to a particular type of user.

Anybody wanting to use simple graphics or charts within their letters should look seriously at *Boffin.*

*Haba Writer II* is overall the most powerful of the bunch but offers no graphics facilities at all. This together with it's complicated command structure would probably limit its appeal to those writing long reports or books.

This leaves *First Word Plus* as some kind of piggy in the middle. It's the most user friendly and it does have the integral spelling checker. Also in its favour it can interchange files with *First Word,* but it's incapable of any serious graphics work, and as a word processor it is left standing by *Haba II.* The spelling checker is fast, yet there are loads of these on the market already. They are slower but cheaper, some retailing for only £20, the more expensive also providing more facilities.

**Product** *First Word Plus* **Price** £79.95 **Supplier** GST Software, 91 High Street, Longstanton, Cambridge CB4 5BS.

**Product** *Haba Writer II* **Price** £74.95 **Supplier** Haba Software, Pier Road, North Feltham Trading Estate, Feltham, Middx.

**Product** *Boffin* **Price** £113 **Supplier** Software Punch, 38 Ullett Road, Sefton Park, Liverpool 17.

# Everything you wa

*. . . about microcomputer tec*
*Keith Hoyle delves into the 8-b*
*tells you what makes them b*
*technology might be chi*

Talking to anyone about microcomputer technology, or reading magazines such as this one, the terms 8-bit micro, 16-bit technology, 32/16-bit machines are bandied about with alarming frequency. Prognostications about where they are all leading are just as common.

Yet just how many people know exactly what is meant by an 8-bit micro? This article attempts to explain what makes up the different types of microprocessors, and looks at current developments which will become the processors of the future.

## Micro processor technology

The Z80, 6502, 8080, and the 6510 are all examples of 8-bit micro processors. The '8-bit' refers to the size of the data bus, which is the internal connection between the CPU (central processing unit), and its internal memory (Ram).

Data from the memory of the computer is transferred into the CPU along the data bus for manipulation. If you look at the illustration below you will see why an 8-bit micro can only address 64K at any one time. Most 8-bit CPUs have an internal address bus some 16 bits wide, this carries the address in memory of a location where a piece of data will come from.

If you think back to the days when you were learning binary notation, and add up all the above numbers you will see that the maximum number the data bus can carry is 255, and the largest number the processor can address is 65356 bytes, or 64K.

## 16-bit CPUs

The Motorola 68000 CPU, probably the most popular 16-bit CPU in use today,

**I--------16 bits wide address bus--------I**

**32768–16384–8192–4096–2048–1024–512–256–**

**128–64–32–16–8–4–2–1**

**I-----8 bits wide-----I**
**data bus**

can be found in the Atari 520/1040 ST, Apple Macintosh, Apple Lisa and the Commodore Amiga. It is also used in laser printers. The Motorola range is quite extensive from the 6800, 6809, and the 68008 (Sinclair QL), to the 68000, 68010, 68020 and the 68000L12 chip which is capable of running at 14MHz.

The CPU residing inside the Sinclair QL is a scaled-down version of the 68000 CPU, simply because it only has an 8-bit address bus. The M68000 on the other hand has a full 16-bit wide data bus and a 32-bit wide internal address bus, but its bigger cousin the M68020 has a full 32-bit wide external address bus.

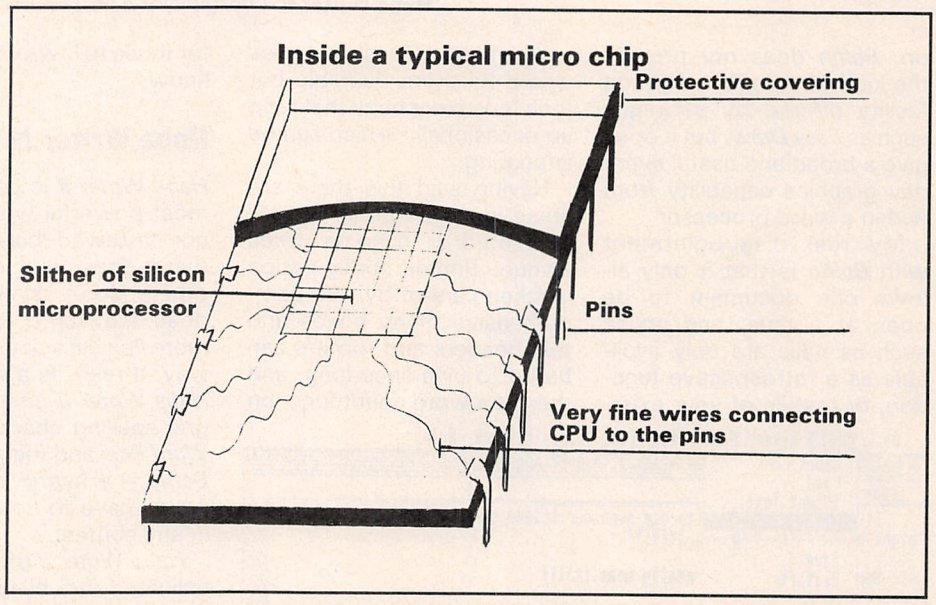
This allows them to directly address 16,384Kb or 16 Megabytes of Ram.

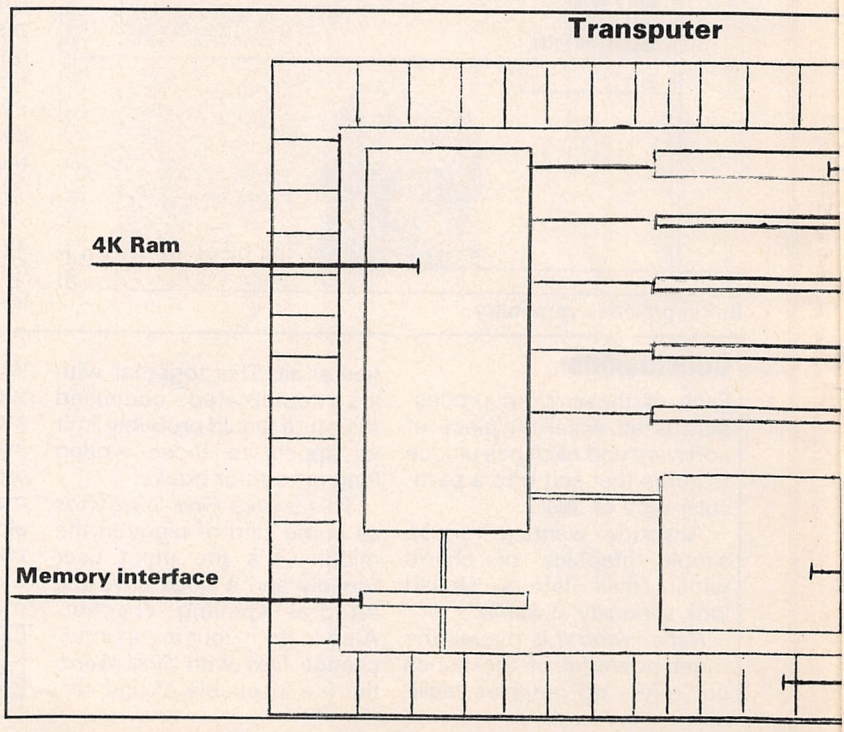
When you think about it, an Atari 1040 ST is actually only utilising 1/16th of the overall CPU capacity.

What is now needed in order to keep up with today's Micro Processor Technology are 2, 4, 8, and 16 Megabyte Ram chips (ULSI). This would allow the CPUs of today to be used to their maximum capacity.

Did you know that the ST in ATARI ST is derived from the fact that the M68000 CPU is a Sixteen/Thirtytwo bit processor?

The chip manufacturer Zilog, which made, notably, the Z80 chip, had a poor start in the 16-bit market due to the fact that its first 16-bit chip, the Z8000, was



# nted to know . . .

*nology but were afraid to ask.*
*and 16-bit micros of today and*
*te. Also, a look at what new*
*ped in in the near future.*

incompatible with the Z80 architecture, and so made it unable to run any of the vast range of the CP/M programs that are available for CP/M compatible machines.

Although Zilog were to produce another compatible 32-bit chip the Z80000 (Z80K) it too was not compatible with the Z80 CPU. Zilog went back to the drawing board and came up with the Z800 16-bit CPU which is compatible with the Z80. The Olivetti M20 computer uses the Z8000.

## Chip technology

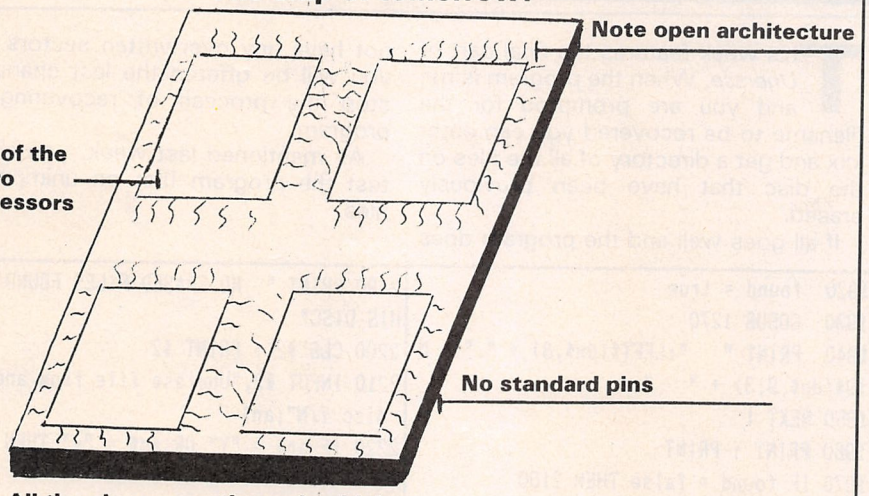
The chip technology of today uses the term VLSI (very large scale integration) which means that you can get more than 100,000 gates on a single piece of silicon.

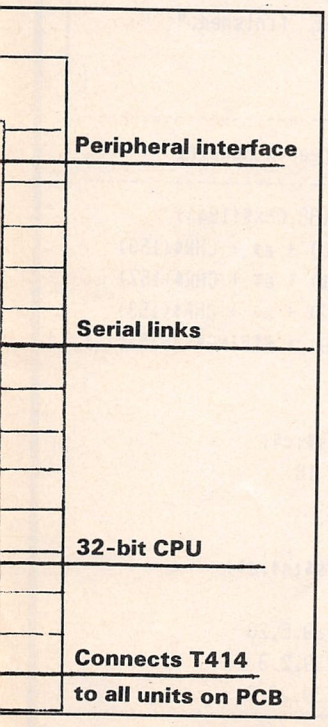
Does the future hold ULSI (Ultra Large Scale Integration), which could mean say more than 3,000,000 gates per single piece of silicon?

As you can see from the above sketch the piece of silicon is quite small when compared to the overall size of the chip itself. The wires connecting the silicon to the outside world are very fragile and a voltage in excess of +35V could 'fry' the chip, in other words it would be like blowing a fuse, the wires would just melt rendering the chip useless. Tomorrow's chips could look like this.

Think of it 4, 8, 16, or even 32 16-bit microprocessor's on a single chip design. (In fact, the Japanese already have a 16Mb Ram chip in development). You could have one CPU for graphics, one for sound control, one for disc I/O, and one that was in control of the other CPU's (supervisor), which could interrupt the execution of any one of its underlings.

**The chip of tomorrow?**




## Transputer

How many people have even heard of a transputer, let alone know what one actually is? The Inmos T414 32 Bit Transputer is a marvel of today's technology.

It is basically a computer on a chip. The Inmos Transputer consists of 4K on-board memory, four memory interface links, peripheral interface, and a 32-bit CPU running at 10 mips (millions of instructions per second).

The transputer is what is termed as a Risc chip (reduced instruction set chip), which means it has only 70 instructions in all. It can be programmed in either Fortran, Pascal and C, but to use more than one transputer in a system and make them run concurrently it has a special language called OCCAM.

This allows transputers in a system to communicate which each other. This is a special technique called parallel processing, which means that each processor is assigned a small portion of calculation, then signals the (supervisory) processor when it has finished its part of the calculation.

When it has received signals from all the processors that they have finished it can carry out the final calculation itself.

The current price of a 10 mips Transputer is around £300, but as production costs and material costs fall the price is expected to drop to around £50. A Transputer runs approximately 10 times faster than a Motorola 68000 CPU!

The serial links on the transputer allow it to communicate with other transputers in a system. The transfer rate of each serial link is 10MBits (million bits per second). Each link can run simultaneously giving a total transfer rate of 80 MBits.

The 4k of on-chip memory is there to replace the conventional registers found on the older chips, and it sees no difference between on-chip memory and standard Ram except for access time.

The transputer can see a total of four giga bytes of ram. (One giga byte is one thousand million bytes, or 1,000 Megabytes.) There are already several products that are compatible with the transputer: the G213 graphics processor, and the M212 disc controller.

Picture the computer system of the future: all links in the system, ie, keyboard, optical disc unit, and all the internal links on what would have been the PCB are now fibre optic cable. At the heart of such a system you would have a transputer which could be further complemented by adding additional transputers as and when they are needed. This system would blur the distinction between software and hardware design. All the technology required for such a system is present today. At the moment though it still costs quite a lot of money to implement each individual item.

*Thanks to Inmos for information pertaining to the transputer.*

# Programming: QL

## Word Wrap

*Phillip Lavender*

This is a quite simple, but useful, procedure to word wrap large blocks of text in any QL window (of any size). Word wrap stops words being cut in half at the end/start of a new line.

```
10 REMark   WORD Procedure (C) 1986 P.Lavender.
20 REMark   Simple word processor
30 :
100 a$='This is a demonstration of the new PROCedure ~WORD~,
the parameters are window number, text to be processed.
eg call by ~WORD 1,
a$~ to print the text a$ to window 1.'
110 CLS
120 PRINT 'Processed text -'
130 FOR f=1 TO 4
140 WORD a$,1
150 END FOR f
160 PRINT \\'Unprocessed text -'
170 PRINT a$
180 :
10000 DEFine PROCedure WORD (a$,n)
10010 LOCal mid$,num,new$
10020 new$=a$
10030  REPeat loop
10040   num=' ' INSTR new$
10050   IF num=0 THEN PRINT#n!!new$;:EXIT loop
10060   mid$=new$(1 TO num-1)
10070   new$=new$(num+1 TO)
10080   PRINT#n!!mid$!
10090  END REPeat loop
10100 END DEFine WORD
```

# Programming: Amstrad CPC

## Unerase

*Eric Roy*

This week features the final part of *Unerase*. When the program is run and you are prompted for the filename to be recovered you can enter xxx and get a directory of all the files on the disc that have been previously erased.

If all goes well and the program does not have any overwritten sectors then you will be offered the last chance to stop the process of recovering the program.

As mentioned last week, you should test the program first on unimportant files.

```
1660 NEXT i
1670 RETURN
1680 REM-----------------------------
1690 REM  Messages displayed on screen
1700 REM-----------------------------
1710 PRINT : PRINT
1720 ON msg GOTO 1740,1800,2000,2090,213
0
1730 '
1740 PRINT "  File found in other user a
reas..."
1750 CLS #2 : LOCATE #2,12,2
1760 INPUT #2,"Continue Y/N";an$
1770 IF an$ = "Y" OR an$ = "y" THEN CLS
#2 : GOTO 1630
1780 GOSUB 1630 : GOTO 2200
1790 '
1800 GOSUB 1630
1810 LOCATE 1,2
1820 PRINT ">>ERASED FILE ";f$;" NOT FOU
ND<<"
1830 PRINT
1840 PRINT " Searching directory for era
sed files"
1850 PRINT
1860 '
1870 found = false
1880 FOR i = 0 TO 63
1890  user = (i * dirlen) + dirptr
1900  IF PEEK(user)  <> erased THEN 1950
1910  IF PEEK(user+1) = erased THEN 1950
1920  found = true
1930  GOSUB 1270
1940  PRINT "   ";LEFT$(dn$,8) + "." + M
ID$(dn$,9,3) + "   ";
1950 NEXT i
1960 PRINT : PRINT
1970 IF found = false THEN 2180
1980 GOTO 2200
1990 '
2000 GOSUB 1630
2010 LOCATE 14,2
2020 PRINT ">>S O R R Y<<"
2030 LOCATE 4,6
2040 PRINT f$;" cannot be unerased!"
2050 PRINT
2060 PRINT "  Part of file has been over
written"
2070 GOTO 2200
2080 '
2090 LOCATE 4,6
2100 PRINT "Ready to unerase  ";f$
2110 GOTO 1750
2120 '
2130 PRINT "  More than one extent has b
een found"
2140 PRINT
2150 PRINT "  The file may not unerase c
orrectly"
2160 GOTO 1750
2170 '
2180 PRINT : PRINT
2190 PRINT "  NO ERASED FILES FOUND ON T
HIS DISC"
2200 CLS #2 : PRINT #2
2210 INPUT #2,"Unerase file from another
 disc Y/N";an$
2220 IF an$ = "Y" OR an$ = "y" THEN CLS
#2 : GOSUB 1630 : GOTO 130
2230 '
2240 MODE 2 : MODE 1
2250 PRINT "UNERASE  finished."
2260 PRINT : PRINT
2270 END
2280 REM-----------------------------
2290 REM  Main screen & Heading
2300 REM-----------------------------
2310 a$ = STRING$(38,CHR$(154))
2320 b$ = CHR$(150) + a$ + CHR$(156)
2330 c$ = CHR$(151) + a$ + CHR$(157)
2340 d$ = CHR$(147) + a$ + CHR$(153)
2350 s$ = CHR$(149) + STRING$(38," ") +
CHR$(149)
2360 '
2370 PRINT b$;s$;s$;c$;
2380 FOR i = 1 TO 16
2390  PRINT s$;
2400 NEXT i
2410 PRINT c$;s$;s$;s$;d$;
2420 '
2430 WINDOW #0,2,39,5,20
2440 WINDOW #1,2,39,2,3
2450 WINDOW #2,2,39,22,24
```

```
2460 '
2470 PRINT #1,,"U N E R A S E"
2480 PRINT #1,," by Eric Roy "
2490 RETURN
2500 REM-----------------------------
2510 REM  Initialise
2520 REM-----------------------------
2530 dirptr = 36864 : erased = 229
2540 dirlen = 32 : extptr = 12
2550 allptr = 16
2560 true = -1 : false = 0
2570 '
2580 FOR i = 0 TO 180
2590  allblk(i) = false
2600 NEXT i
2610 '
2620 FOR i = 0 TO 15
2630  usarea(i) = false
2640  extent(i) = true
2650 NEXT i
2660 RETURN
2670 REM-----------------------------
2680 REM  Insert disc / load sectors
2690 REM-----------------------------
2700 GOSUB 1630
2710 LOCATE 2,6
2720 PRINT "Insert the disc with the era
sed file"
2730 PRINT
2740 PRINT,"into drive A."
2750 '
2760 sector = &C1 : track = 0
2770 PRINT #2
2780 INPUT #2,"Is it a System,Data,IBM d
isc S/D/I";form$
2790 IF form$ = "S" OR form$ = "s" THEN
sector = &41 : track = 2
2800 IF form$ = "I" OR form$ = "i" THEN
sector = &1 : track = 1
2810 CLS #2
2820 '
2830 a$ = "A" : |DRIVE,@a$
2840 POKE &A04B,track
2850 POKE &A04C,sector
2860 CALL &A000
2870 RETURN
2880 REM-----------------------------
2890 REM Hex data loader
2900 REM-----------------------------
2910 LOCATE 14,6
2920 PRINT "CODE LOADING"
2930 MEMORY &8FFF
2940 RESTORE 3170
2950 READ a$
2960 mem = VAL("&"+a$)
2970 dat = 3270
2980 '
2990 sum = 0
3000  READ code$,check$
3010  IF code$ = "***" THEN RETURN
3020   FOR i = 1 TO 15 STEP 2
3030    byte = VAL("&"+MID$(code$,i,2))
3040    POKE mem,byte
3050    sum = sum + byte
3060    mem = mem + 1
3070   NEXT i
3080  dat = dat + 10
3090 IF sum = VAL("&"+check$) GOTO 2990
3100 '
3110 LOCATE #2,7,2
3120 PRINT #2,"ERROR in Data line...";da
t
3130 END
3140 REM-----------------------------
3150 REM  Data lines for UNERASE
3160 REM-----------------------------
3170 DATA A000
3180 DATA CD30A0C5D5E5CD66,054F
3190 DATA C6E101000209D1C1,0345
3200 DATA 0C10F01813CD30A0,02D4
3210 DATA C5D5E5CD4EC6E101,0542
3220 DATA 000209D1C10C10F0,02A9
3230 DATA ED4B49A0CD18B9C9,0488
3240 DATA 0E07CD0FB9ED4349,0323
3250 DATA A03A4BA0571E003A,0274
3260 DATA 4CA04F2100900604,01F6
3270 DATA C900000000000000,00C9
3280 DATA ***,***
```



# Multi-save

A W Pryer

If you spend a lot of time programming there is nothing more annoying than having finished a fruitful five hour session and then having someone unplug your machine to do the hoovering. Multi-save will regularly save programs after a user set time limit. Also, it offers a printer utility menu to automatically set such things as underline, enhanced, bold etc printing.

The commands are as follows.

**Autosave "filename"*

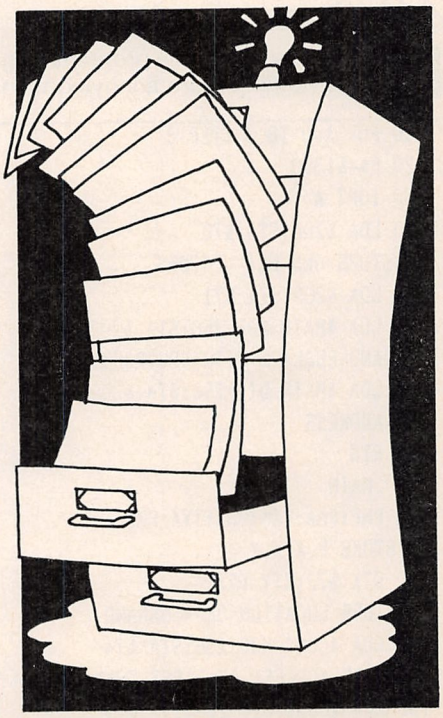
**Nosave* turns off the autosave facility

**Menu* calls the printer menu

**Commands* lists the commands and their syntax

```
 10 FOR A=0 TO 3 STEP 3
 20 P%=&1300
 30 [OPT A
 40 LDA &208:STA &70
  \STORE OLD CLI VECTORS
 50 LDA &209:STA &71
 60 LDA #MAIN MOD 256:STA &208
   \AND REPLACE WITH NEW ROUTINE'S
 70 LDA #MAIN DIV 256:STA &209
   \ADDRESS
 80 RTS
 90 .MAIN
100 PHP:PHA:TXA:PHA:TYA:PHA
  \STORE P,A,X,Y
110 STX &72:STY &73
  \STORE LOCATION OF *COMMAND
120 LDA #COM1 MOD 256:STA &74
  \STORE ADDRESS OF FIRST COMMAND IN
130 LDA #COM1 DIV 256:STA &75
  \LOCATIONS &74,&75
140 JSR checkcommand
  \CHECK FOR NEW COMMAND
150 LDA &76:CMP #1:BEQ menu1
  \IF IT IS JUMP TO ROUTINE
160 LDA #COM2 MOD 256:STA &74
170 LDA #COM2 DIV 256:STA &75
180 JSR checkcommand
190 LDA &76:CMP #1:BEQ autosave1
200 LDA #COM3 MOD 256:STA &74
210 LDA #COM3 DIV 256:STA &75
220 JSR checkcommand
230 LDA &76:CMP #1:BEQ nosave1
240 LDA #COM4 MOD 256:STA &74
250 LDA #COM4 DIV 256:STA &75
260 JSR checkcommand
270 LDA &76:CMP #1:BEQ commands1
280 .exit
290 PLA:TAY:PLA:TAX:PLA:PLP
  \IF NO MATCH,RESTORE P,A,X,Y THEN
300 JMP (&70)
  \JUMP TO OLD CLI
310 .checkcommand
  \CHECK FOR NEW COMMAND
320 LDY #0
330 .check2
340 LDA (&74),Y:CMP #0:BEQ commandmatc
hed \LOAD A WITH NEW COMMAND CHRACTER
350 CMP (&72),Y
  \COMPARE IT WITH PASSED COMMAND
360 BNE nomatch
  \BRANCH IF NOT EQUAL
370 INY:JMP check2
380 .commandmatched
390 LDA #1:STA &76:RTS
400 .nomatch
410 LDA #0:STA &76
420 RTS
```

```
430 .COM1
   \NEW COMMANDS AND JUMP ADDRESSES
440 EQUS("*MENU")
450 EQUB(0)
460 .menu1 JMP menu
470 .COM2
480 EQUS("*AUTOSAVE"):EQUB(0)
490 .autosave1 JMP autosave
500 .COM3
510 EQUS("*NOSAVE"):EQUB(0)
520 .nosave1 JMP nosave
530 .COM4
540 EQUS("*COMMANDS"):EQUB(0)
550 .commands1 JMP commands
560 .getparameters
   \GET ANY PARAMETERS REQUIRED
570 LDX #0
580 .get2
590 INY
600 LDA (&72),Y:STA &C00,X:CMP #13:BEQ
gotallparameters \STORE AT &C00
610 INX
620 JMP get2
630 .gotallparameters RTS
640 .autosave
   \AUTOSAVE ROUTINE
650 JSR getparameters
660 LDX #clock MOD 256
670 LDY #clock DIV 256
680 LDA #4
690 JSR &FFF1
   \RESET INTERVAL TIMER TO 5 MINS
700 LDA #auto2 MOD 256:STA &220
   \STORE AUTOSAVE VECTOR AT EVENT
710 LDA #auto2 DIV 256:STA &221
   \JUMP VECTOR
720 LDA #0:STA &79
730 LDA #14:LDX #5:JSR &FFF4
   \ENABLE EVENT NUMBER 5
740 JMP end
750 .auto2
   \MAIN AUTOSAVE ROUTINE
760 PHP:PHA:TXA:PHA:TYA:PHA
   \SAVE P,A,X,Y REGISTERS
770 LDA &79:CMP #1:BNE auto3
   \CHECK IF ENABLED
780 JMP end
790 .auto3
800 LDX #clock MOD 256
810 LDY #clock DIV 256
820 LDA #4:JSR &FFF1
830 .save
840 LDA &12:STA saveblock2
850 LDA &13:STA saveblock2+1
860 LDX #saveblock MOD 256
870 LDY #saveblock DIV 256
880 LDA #0:JSR &FFDD
   \SAVE PROGRAM USING OSFILE
890 JMP end
900 .clock
910 ]:IF A<>0 THEN 930
920 INPUT"ENTER AUTOSAVE TIME DELAY
        IN SECONDS(1-3600)"TD:IF TD<
1 OR TD>3600 THEN 920 ELSE TD=0-(TD*100)
930 [OPT A
940 EQUD(TD)
950 EQUB(&FF)
960 .saveblock
   \PARAMETER BLOCK FOR OSFILE
970 EQUB(0)
980 EQUB(&C)
990 EQUB(0)
1000 EQUB(&19)
1010 EQUB(&FF)
1020 EQUB(&FF)
1030 EQUB(&23)
1040 EQUB(&80)
1050 EQUB(&FF)
1060 EQUB(&FF)
1070 EQUB(0)
1080 EQUB(&19)
1090 EQUB(&FF)
1100 EQUB(&FF)
1110 .saveblock2
1120 EQUB(0)
1130 EQUB(0)
1140 EQUB(&FF)
1150 EQUB(&FF)
1160 .nosave
1170 LDA #1:STA &79
1180 JMP end
1190 .menu
1200 LDA #3:JSR &FFEE
1210 LDA #22:JSR&FFEE
1220 LDA #7:JSR&FFEE
1230 LDA #23:JSR&FFEE
1240 LDA #1:JSR&FFEE
1250 LDA #0:JSR&FFEE
1260 LDA #0:JSR&FFEE
1270 LDA #0:JSR&FFEE
1280 LDA #0:JSR&FFEE
1290 LDA #0:JSR&FFEE
1300 LDA #0:JSR&FFEE
1310 LDA #0:JSR&FFEE
1320 LDA #3:JSR &FFEE
1330 LDA#12:JSR&FFEE
1340 LDY#0
1350 LDA #TEXT MOD 256:STA &74
1360 LDA #TEXT DIV 256:STA &75
1370 .SCREEN
   \CREATE PRINTER DRIVER SCREEN
1380 LDA (&74),Y
1390 CMP#255:BEQ SELECT
1400 JSR &FFE3
1410 CPY#&FF:BEQ SCREEN2
1420 INY:JMP SCREEN
1430.SELECT JMP key
1440 .SCREEN2
1450 INC &76:INC &75:LDY#0:JMP SCREEN
1460 .end2
1470 LDA #22:JSR&FFEE
1480 LDA #7:JSR&FFEE
1490 .end
1500 PLA:TAY:PLA:TAX:PLA:PLP
1510 LDA #3:JSR &FFEE
1520 RTS
1530 .TEXT
1540 EQUB(13)
1550 EQUB(132)
1560 EQUB(157)
1570 EQUB(141)
1580 EQUB(135)
1590 EQUS("   DOT MATRIX PRINTER DRIVER
")
1600 EQUB(13)
1610 EQUB(132)
1620 EQUB(157)
1630 EQUB(141)
1640 EQUB(135)
1650 EQUS("   DOT MATRIX PRINTER DRIVER
")
1660 EQUB(13)
1670 EQUB(132)
1680 EQUB(157)
1690 EQUB(135)
1700 EQUB(31)
1710 EQUB(11)
1720 EQUB(3)
1730 EQUS("(C)1987 A.W.Pryer")
1740 EQUB(31)
1750 EQUB(3)
1760 EQUB(6)
1770 EQUB(131)
1780 EQUS("1...CONDENSED PRINT")
1790 EQUB(31)
```

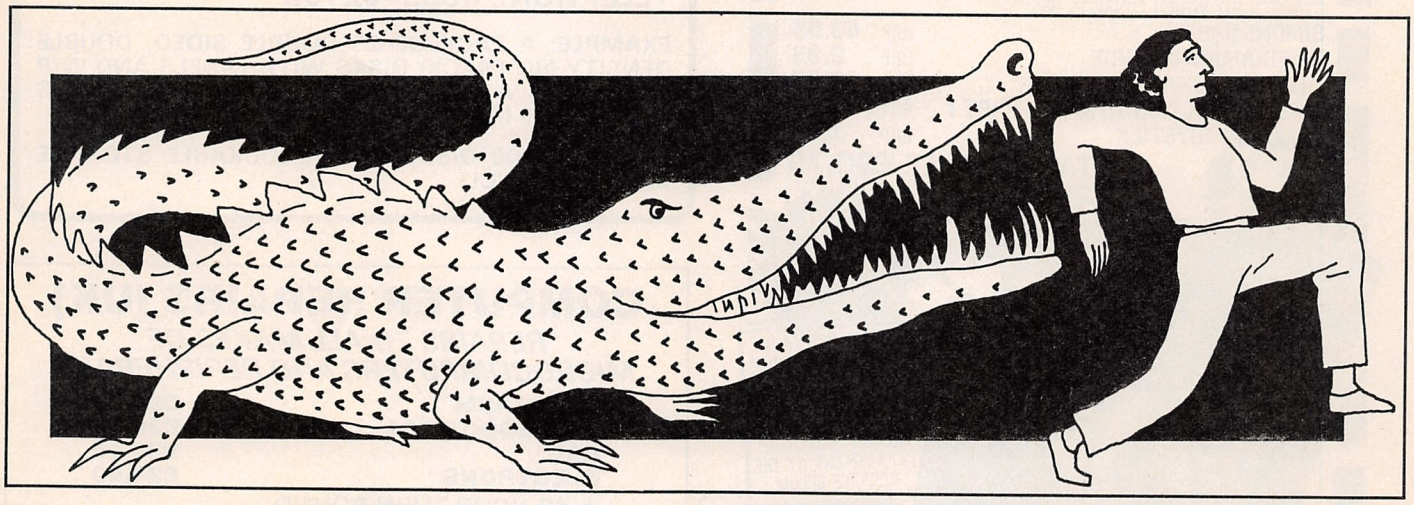


# Xedion

*Mark Cullimore*

At last, the final episode of Xedion. After typing it all in and debugging note that the game is controlled by a joystick in port 2, *F1* pauses and *F3* unpauses the game.

Should you not wish to type in the listing you can get a copy on cassette for £2.50 or £3.50 on disc from Mark Cullimore, 5 Heol Sant Bridget, St Brides Major, Bridgend, Mid Glamorgan CF32 0SL.



```
60410 DATA 0,0,60,0,0,24,0,1,24,128,5
60420 DATA 24,160,21,60,168,85,102,170,255,223,255
60430 DATA 85,94,170,21,60,168,5,24,160,1,24
60435 DATA 128,0,24,0,0,60,0,0,102,0,0
60440 DATA 94,0,0,94,0,0,60,0
60450 DATA 0,0,0,0,0,0,0,0,0,0,62,0
60455 DATA 0,127,0,0,201,128,0,201,128,0,127,0
60460 DATA0,34,0,0,28,0,0,0,0,0,0,0
60465 DATA0,0,0,0,0,0,0,0,0,0,0,0
60470 DATA0,0,0,0,0,0,0,0,0,0,0,0
60480 DATA0,0,0
61000 :
61001 FORA=0TO4:POKE2043+A,251:NEXT
61002 POKE53280,6:POKE53281,6
61003 GOSUB63999
61005 PRINT"■■■■■■"TAB(30)"■/■\■"
61010 FORA=0TO15:PRINTTAB(30)"■|■|"
61015 NEXTA
61017 PRINTTAB(30)"■\■/"
61020 PRINT"■■■■■■
```

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**From: E & J Software Room 7, 37 Westmoor Road, ENFIELD, Middlesex EN3 7LE**

# Memory move

*Simon T Goodwin*

This command for the Amstrad CPC series allows large chunks of memory to be moved easily. The syntax is as follows.

*:Move, source address, destination address, length*

```
10 REM ------------------------------
20 REM          !MOVE command
30 REM ------------------------------
40 REM
50 MEMORY 41999
60 FOR n=42000 TO 42049
70 READ a$
80 POKE n,VAL("&"+a$)
90 NEXT
100 CALL 42000:REM INITIALISE
110 REM
120 DATA 21,19,A4,01,1D,A4,C3,D1
130 DATA BC,00,00,00,00,22,A4,C3
140 DATA 26,A4,4D,4F,56,C5,DD,6E
150 DATA 04,DD,66,05,DD,56,03,DD
160 DATA 5E,02,DD,46,01,DD,4E,00
170 DATA ED,B0,C9,00,00,00,00,00
180 DATA 00,00,00,00,00,00,00,00
```

# Sideways

*Jonathan Temple*

This short machine code routine for BBC and Electron computers allows text to be printed sideways from the current text position. Use **Line text* to print.

Note that the routine does not work in Mode 7 and uses characters 253–255.

```
 10 FOR pass=0 TO 1
 20 P%=&A00:[OPT pass*2
 30 BEQ bad:STX &F2:STY &F3:LDY#0
 40 .loop LDA (&F2),Y:STA &CEF
 50 CMP #13:BEQ out:TYA:PHA
 60 LDX #&EF:LDY #&C:LDA #10
 70 JSR &FFF1:LDY #7:.lp2
 80 LDX #7:LDA &CF0,Y:.lp3
 90 LSR A:ROL &CF8,X:DEX:BPL lp3
100 DEY:BPL lp2:PLA:TAY
110 LDA #255:JSR &FFEE:LDA #10
120 JSR &FFEE:LDA #8:JSR &FFEE
130 INY:BPL loop:.out JMP &FFE7
140 .bad JMP &E310:]:NEXT
150 ?&200=0:?&201=&A:MODE 4
160 PRINT  :*LINE Sideways Text
```

# Poly-Fractals

*Olaf Lipor*

Create interesting and complex graphic effects with this BBC program (also works on the Electron). After a short pause while the machine code is assembled you will be prompted on the use of the *Z* and *X* keys within the program.

```
10MODE2
20VDU23;8202;0;0;0;
30COLOUR2:PRINTTAB(1,8)"Please wait -
"'" m/c initialising":MOVE500,500
40FORA%=1TO55:READF%:A%?&900=F%:NEXT:
F%=0:A=INKEY(100)
50COLOUR132:CLS:A=INKEY(5):COLOUR128:
CLS
60FORA%=0TO18STEP2:COLOUR8:PRINTTAB(A
%,0);"*":COLOUR15:PRINTTAB(A%+1,0);"*":N
EXT:PRINTTAB(0,1);"*";TAB(19,2);"*":COLO
UR8:PRINTTAB(19,1)"*";TAB(0,2)"*"
70FORA%=0TO18STEP2:COLOUR15:PRINTTAB(
A%,3);"*":COLOUR8:PRINTTAB(A%+1,3)"*":NE
XT
80COLOUR9:PROCtitle("Trichromatic Ima
ge",1,1):COLOUR14:PROCtitle("Generator",
5,2)
90COLOUR3:PRINTTAB(1,29)"Use 'Z' & 'X
' keys"TAB(1,30)"to polyfractulize";:A%=
GET:COLOUR129
100?&996=RND(256):?&997=RND(15):?&998=
RND(256)
110GCOL0,?&997:VDU25,ASC("U"),(?&996 *
4)+50;?&998 *4;:A%=GET:IFF%=7CALL&929
120F%=F%+1:IFF%<17GOTO100 ELSEPRINTTAB
(0,10);:FORA%=1TO40:PRINTCHR$(A%?&900);:
NEXT:A%=GET:RUN
130DEFPROCtitle(A$,X%,Y%)
140FORZ%=1TOLENA$:PRINTTAB(X%+Z%-1,Y%)
;MID$(A$,Z%,1):SOUND0,-15,3,3:A=INKEY(25
):NEXT:ENDPROC
150DATA72,97,118,101,32,121,111,117,32
,110,111,116,104,105,110,103,32,32,32,32
,98,101,116,116,101,114,32,116,111,32,10
0,111,44,32,112,114,97,116,32,63,169,9,1
62,3,32,244,255,169,10,162,3,32,244,255,
96
```

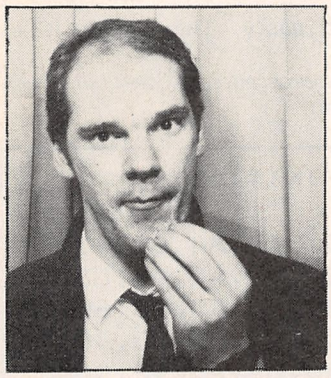
# Programming Spotlight – Magic

*Stuart Slater*

Programming Spotlight is where long programs are featured and offered to sale to you, the reader, by the author. Programs featured in this spot become the copyright of Popular as usual, for the sum of £10. We reserve the right to set a reasonable price for the programs on offer.

Magic is a two level graphical adventure where it follows the adventures of a freelance druid and his exploits. You have the option of casting water, fire or other spells to defeat the roaming monsters while seeking to escape from that level.

So, for a copy of Magic on the Commodore +4 and C16 send £2.25 to Stuart Slater, Programming Spotlight, Popular Computing Weekly, 12–13 Little Newport Street, London WC2H 7PP.



## with Kenn Garroch

### Basic alteration

*Norman Stone, of Chelmsford, Essex, writes:*

**Q I have a Commodore 128, a 1570 disc drive, and a MPS 1000.**

**I wish to know if you can alter a program – i.e. if the program was written for the 48K Spectrum, could the Basic language be altered so that it can be loaded and used on a Commodore 128.**

**If it can then how do I go about this? I must point out that this is not for a commercial game.**

A If the program is written in Basic and contains no *Pokes, Peeks* machine code, then it is usually possible to convert the program but it's not always worth the effort needed. Basic is a standard language, but there are many differences between the various dialects used on other machines.

To convert a program, first of all you need a listing from the machine you are converting from. Most of the commands will convert straight away but there are a few differences and the best way to sort these out is to get both Basic manuals and find out what the commands do, and find the nearest equivalent on the C128.

The dialect of Basic used on the C128 is fairly common and contains most of the commands you will need for a conversion. Unfortunately, the Spectrum uses a vary strange version of Basic, the oddest thing being the string handling. The main thing to note is that when splitting strings up, most Basics use the *Lefts, Rights* and *Mids* functions. The Spectrum however, uses *To*. An example is given below.

```
LET a$ - "This is a string"
PRINT a$(1 TO 7)
gives "This is"
Normal Basic could use:
PRINT LEFT$(a$,7)
to obtain the same effect.
```

String arrays on the Spectrum can also be a little odd since *Dim a$(10)* doesn't give an array of 10 strings but defines a$ to have a constant length of ten characters. Use *Dim a$(10)* as the equivalent to Dim a$(10,10).

For simple Spectrum programs, the two oddities mentioned above are really all you need to know to convert to the Commodore. For more complex programs, the best thing to do is see what the program does, then rewrite it from scratch.

### Pioneering video

*B Cooper, of Rue-De-Pont Marquet, St Brelade, Jersey, writes:*

**Q I am thinking of buying another computer (I own an Acorn Electron). I wish to use the computer for video work and have read about the Pioneer PX7 (MSX) and the Commodore 128/64. I noticed that the Pioneer PX7 can superimpose video pictures with its display. Is this possible on the Commodore machines? I would like to use the graphics available on these machines.**

A I presume the PX7 is an MSX machine, in which case, it should be possible to set the back plane of the video display to take an incoming video picture. Not all MSX machines have this facility but the video processor chip, the TMS 9929A is definitely capable of it (set bit 0 to one in VPD reg 0). Presumably, the PX7 has an external video input which will allow this picture mixing.

The VIC chip on the Commodore machines does not allow external video to be made part of the display and, as far as I know, it would take a bit of electronics and some butchery to get them to do so. There may be some third party manufacturer somewhere which disagrees?

### MPS Ribbon

*A Dean of Wideopen, Newcastle Upon Tyne, writes:*

**Q I have a Commodore 64 with an MPS 80 1 printer and recently my printer ribbon has dried up. I have tried all the computer shops in Newcastle for a new one, but none of them stock them any more. I wonder if you know anywhere where I may order one by mail?**

A There are a number of places, pick one of the following:
Thoughts & Crosses, 33 Market Street, Heckmondwike, West Yorks. Tel. 0924 402337, or MicroMedia, Rydal Mount, Baker Street, Potters Bar, Herts. Tel 0707 50913.

Best to phone first to make sure they have one in stock but, since they advertise them, they should.

### Atari or Amstrad?

*Steven Delany of Northfield, Aberdeen, writes:*

**Q I currently own an Amstrad CPC 6128 and am considering upgrading to the Atari 520 STFM. I would like information on two subjects before I do so.**

**Firstly, the ST has a built in TV modulator. Using this, can you display 80 column text on a domestic colour TV set? If so, is it better quality than you get via the Amstrad MP2 modulator (which is unreadable in 80 column mode). If not, could you advise on an alternative cheaper monitor to the two produced by Atari. With the modulator, can you display all three screen resolutions with a domestic TV?**

**My second query is concerning discs and drives. The 520 STFM has a built in ½ Mega byte drive which, when formatted, gives 360K of storage. The 1 Mega drive built into the 1040ST gives 720K of formatted storage. Both drives take double density discs, but the 520 is single sided, the 1040 double sided. On the Amstrad the drive is single sided, however, it is possible to use both sides by turning the disc over. Can you do this on the Atari? If so, should you use double sided discs as with the 1040 or will normal single sided discs be OK?**

A The 520 STFM will display only the two lower resolution modes on a domestic TV via the modulator. The high res monochrome mode is only available with Atari's monitor SM125 since it uses a 70Hz signal that is incompatible with other monitors. The colour modes are, however, available via standard RGB so any RGB monitor can be used.

The chances are that the 80 column mode available in medium resolution is roughly the same quality as that put out by the Amstrad, so you are better off with a monitor if you can afford one.

The 3·5 inch discs used on the Atari are not reversible as are the 3 inch discs used on the Amstrad. The ½ Meg drive will only hold 360K and turning it over isn't going to work. The double sided system used on the 1040 gives 1 Meg by using a double sided disc drive, i.e. a head for each side and hence the need for double sided discs. For the ½ Meg drive, single sided, double density discs are what you need.

**Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Kenn Garroch and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke, PCW,* 12-13 Little Newport Street, London WC2H 7PP.**

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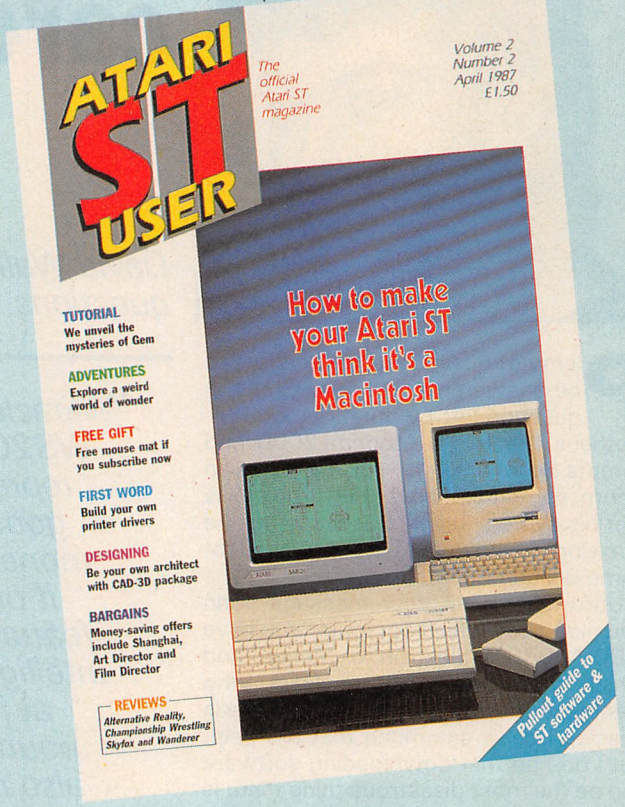


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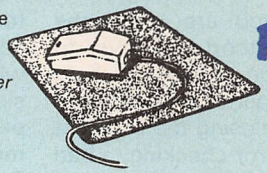

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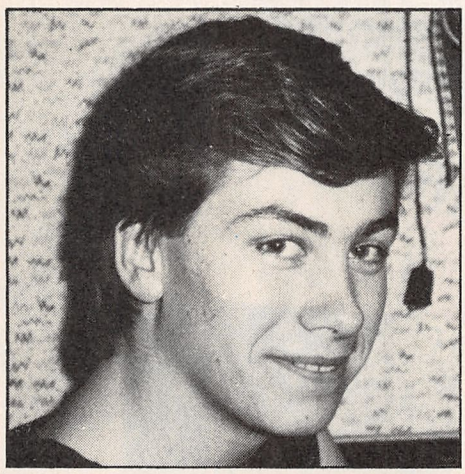


# Choose your modem carefully

*David Wallin returns with answers and advice for readers' questions*

Plenty of questions from readers to be answered this week. Firstly, a question left by John Hall on Prometheus. He has a Modem 2000 and comms Rom which he purchased at an Acorn computer show. His problem is that his system keeps crashing when he is trying to download from Prestel or some Bulletin Boards.

Unfortunately in your message John you didn't say which computer you have (BBC A, BBC B, Electron, or Master) and which the Rom is (or at least who manufactures it). With these details missing I can't say much that will help, but I do find that downloading software can be the most disastrous thing there is in communications.

One thing to remember is that there are various download methods, each a recognised Format in itself; Ascii, Hex, XModem, YModem, CP/M, Modem7, Viewdata (there is only one standard for Viewdata systems) and CRC methods to name but a few. Whilst most standards are very similar there can be basic differences which mean that they are not compatible. Ascii is the simplest transfer method, simply sending Ascii characters. 16-bit CRC, a method used by *Comm+*, is one of the most accurate and powerful and will work on 8-bite machines.

So, make sure you are using the correct download method and never to try and download on a line which is anything less than perfect. As downloading (except when using the simplest methods) involves error checking, a bad line can prevent you from even getting past the first block of data. This is both frustrating and, as you are on-line for a long time, be expensive.

Next, on to news about Spectrum Viewdata host software. The details about this software which enable Spectrum owners to run their own viewdata systems, were left to me on Prometheus by someone called Frodo (it takes all sorts, I suppose). It is supposed to be better than Communitel (the BBC's viewdata host system) in every possible way.

Whether this is true or not I don't know, though I find it hard to believe as the BBC is potentially a much better communicating computer than the Spectrum. For example, the Spectrum has a screen width of 32 characters, the BBC 40.

> *"Miracle Technology's WS2000 modem represents very good value for money. Although if offers most features found on intelligent modems at just a few pounds more, it also resembles a full manual modem"*

Viewdata systems are 40 characters wide and so the Spectrum has problems coping with them. On top of that, the BBC has Mode 7, the graphics of which are based on the viewdata graphics set.

Also the BBC can easily be connected to a disc drive (all of which are compatible) but the Spectrum is either stuck with the Microdrive system which is slow or a series of different and incompatible disc drives. Anyway, if you want more information, contact me at my Prestel Mailbox number: 088349334.

"Power without the Price" is the sales pitch used for selling the Atari ST and Mr T Bradley strongly agrees with it. He wants to know what modem fulfils the same specification. Well, I can think of four modems which are in the £100–£150 bracket which do give a lot of power (there are of course others, but these four are about the best in the price range).

Miracle Technology's WS2000 weighs in at £110 and represents very good value for money. This is a device of the manual speed select variety. Since whilst it offers most features found on intelligent modems at just a few pounds more and performs most of its functions and operations automatically, it also resembles a much cheaper, fully manual modem. Personally I would not really recommend it to the beginner – an intelligent modem at only a few pounds more is a good deal easier to use and more powerful.

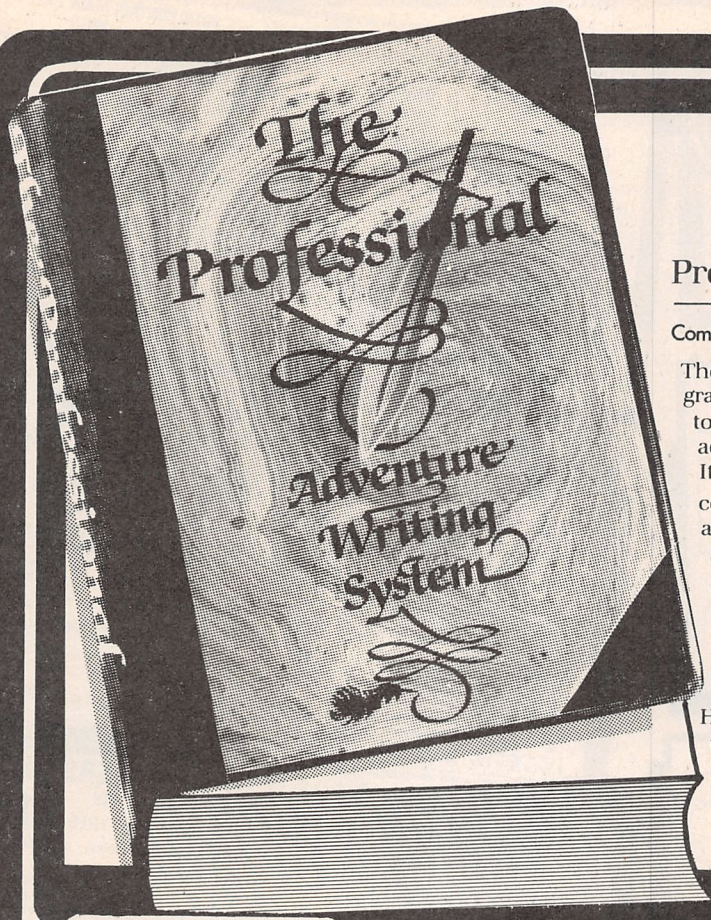
So on to these cheap, intelligent modems. There is the WS4000, the Astracom AC1000 and the PACE Linnet. The WS4000 is a fairly good modem, though a bit overpriced at £150. It has 300/300, 1200/75, 75/1200 and 1200/1200 as standard with 1200/1200 full duplex available as an upgrade. Auto dial and answer are there, with bell speeds also being standard.

The WS4000 could be described as either an intelligent WS2000 or a cut down WS3000 – all in all a very good modem but about £15 more than it should be.

Although there is an internal telephone directory, it is not battery backed up and so unplugging the modem, or even a powercut, will lose you your directory and you'll have to type the whole lot in again.

The AC1000 comes from a company called Astracom. It appears to be a fairly good intelligent modem and carries a price tag of £145. It offers 1200/75, 75/1200 and 1200/1200 but no 300/300 which I find odd. Autodial and answer are also standard. Basically it is very similar to the WS4000 both in specifications and price. So, in fact, is the Linnet from Pace. It is a little cheaper at £139 and does have 300/300, but no 1200/1200. There is auto answer and dial but no Ans facility (the WS4000 and AC1000 both have Ans). The phone number store is 32 numbers long and should suffice most people.

For the ST, which? Well, I think the WS4000 is best, though the lack of a battery-backed number store is annoying and if you think that will cause a problem then go for one of the other two modems. Ideally, see what software packages there are and find out if they recommend one specific modem, if so that should be the best one.

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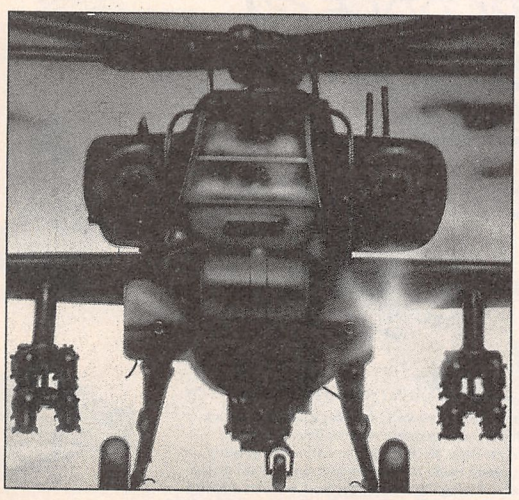

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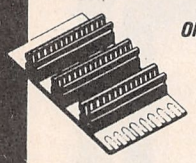

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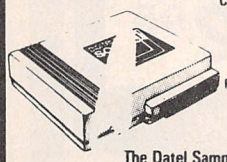

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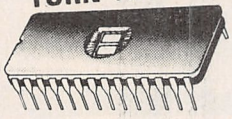

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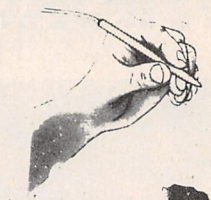

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# Watch for that little black box

*Mark Jenkins with new musical packages for the BBC and Amstrad PC*

In the past few years the IBM PC range has been popular as a music micro over in the States, where they can afford that sort of thing. The fact of the matter is that the PC really is a Personal Computer in the US, but it's only with the release of the affordable Amstrad PC that British musicians are taking to the system in any numbers.

Luckily many companies are matching the price of music software to the new low-priced PCs, so you won't find yourself spending big business money for music software. But before we go on to look at one such package (Passport's *Master Tracks* Midi composer) we'll take a quick look at a new accessory for the BBC micro.

The Barry Box was designed by Barry Landsberg and is an eight-bit digitiser for the standard BBC (BBC Master Series compatibility is coming along in the autumn).

The "black box" itself has input and output level controls, a microphone input socket and an exterior output so you can replay sounds through a hi-fi rather than through the BBC's built-in speaker.

The built-in software has several different sections beginning with a Help page. You can load or save sounds to disc or sideways Ram, dump the screen display to an Epson-type printer or exit the program to standard Basic.

The other options – mainly available on the function keys or shifted function keys – include selection of trigger mode, play sound or play reversed sound, display waveform, analyse frequency or amplitude envelope, or smooth out sound (by amplitude or frequency). You can select a sampling time and are shown the buffer locations for the sample start and end plus the number of sample points taken; if you choose to display the amplitude waveform of a sound you can set the resolution to show any segment of the sound.

The frequency analysis page will show you not only the waveform of the sound you've played but also any significant sideband harmonics. Changing the resolution on this display will allow you to measure the frequency of notes and harmonics to within a few Hertz.

The sampling rate of the Barry Box can be varied from 1.5kHz to 40kHz, and at the upper rate you should get a respectably smooth sound. There are no obviously musical functions in terms of playing scales or programming sequences, but it is possible to automate each section of the software using simple Basic.

The Barry Box is also capable of creating sine waves to an accuracy of 0.1Hz and giving a "moving needle" display of the pitch of an input such as an electric guitar. As such you might find it useful for all sorts of applications, although perhaps not as a musical instrument – more as a sort of musician's toolkit . . .

On to *Master Tracks PC,* which will set you back a little more – to be precise, £299 for the software and output card and £245 for the MPU-IPC Midi interface. It's designed for an IBM compatible with 256K (ideally 320K) of memory.

*Master Tracks* is a very powerful Midi composer which copes with up to 60 tracks of polyphonic information including velocity, after-touch, patch change and so on. Thanks to a technique known as dynamic phrase allocation, these tracks don't all have to be the same length and can loop independently, and you can enter notes in real time from a synth keyboard or one at a time from the computer keyboard.

Once you've recorded a basic track you can play it back from any point and punch in and out to make overdubs. Tracks can be edited and combined (not that you're going to be short of tracks with 60 available) and you can alter the velocity of notes played back.

There are five main operating screens – pattern, edit, step edit, song and song list, which are all fairly self-explanatory except the last, which allows you to define a whole set of songs from previously composed material. Each screen has a main window in the centre with options down the side selected by their initial letters or with the cursor keys, plus a display at the top and a message window at the bottom. Almost all functions have a Help option which brings up a few lines of useful information in the centre of the screen.

*Master Tracks* can be run from a hard disc and each track can be given the name of an instrument up to 11 letters long. You can select Midi input and output channels and either set a pattern's length before you begin recording or let the machine record until you want it to stop.

Editing routines include erasing a track, transposing a whole track, correcting down to 64th triplets, changing velocity values or merging tracks together. The edit display in fact shows all Midi events (P=program change, A=aftertouch, W=pitch wheel change and so on) and so any of these events in your performance (including individual notes played) can be changed or edited out.

As you can see, *Master Track* offers a powerful number of options. The only problem is that it seems slow and difficult to use when compared to the latest Atari 520ST products. Quite often you're faced only with a *Wait* statement while the computer thinks about what you've asked it to do, and this can lead to problems if you don't give it time to think.

Keyboard control is much less satisfactory from the musician's point of view than the mouse control systems found on most Atari products, and although the on-screen labelling is pretty good, there is still a certain amount of memory work involved.

If you already have an Amstrad PC, the Passport system (or similar ones from Octave Plateau and other companies which we'll review in the near future) is a logical choice which will give you massive numbers of control options over as much Midi equipment as you like. However, if you're buying a music-oriented system from scratch, you ought to check out the Atari ST range as well.

*BML Electronics, 24 Larch Grove, Bletchley, Milton Keynes MK2 2LL, 0908 640805. Price: £79.95 including user guide, cables and microphone.*

*Rittor Music Europe Ltd, 149 The Broadway, Cricklewood, London NW2 3HY, 01-208 0558.*

If you have any queries or tips for this column, please write to Mark Jenkins at *Popular Computing Weekly,* 12–13 Little Newport Street, London WC2H 7PP. Mark would also welcome examples of your own music on audio or program tape, or disc.

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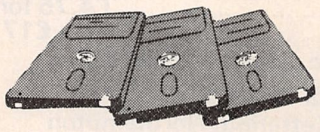

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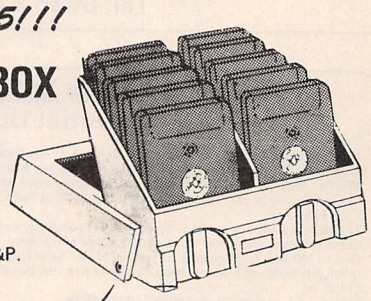

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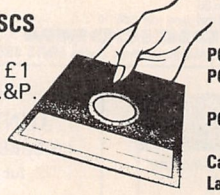

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# New Releases

*John Cook looks through this week's new arrivals*

## Amstrad CPC

**Program** *Alpine Games* **Type** Arcade **Price** £2.99 **Supplier** Atlantis Software, 28 Station Road, London SR25 5AG.

As a *Winter Games* variant, at least it does a better job than the infamous Anco *Winter Events* at thinking up a new name. But only just.

**Program** *Sailing* **Type** Arcade/Strategy **Price** £9.99 (tape), £14.99 (disc) **Supplier** Activision, 23 Pond Street, Hampstead, London NW3 2PN.

See Commodore 64 listing for comment.

**Program** *H.R.H.* **Type** Text Adventure **Price** £2.99 **Supplier** 8th Day Software, 18 Flaxhill, Moreton, Wirral, Merseyside L46 7UH.

Out with the addition of graphics on Spectrum for quite some time, now comes the text only CPC version – having said that it is four pounds cheaper than its predecessor.

The plot is that the Queen's dole cheque arrives on your doormat one Wednesday morning due to an administrative mix up in the DHSS. Naturally, being the Queen (with all those dependants, heating allowance for 16 royal palaces, etc) it all adds up to quite a tidy sum.

Naturally, without this money, the whole infrastructure of the British monarchy would crumble in hours – yes – you must cash the Giro and, for the good of the country, hand the bananas to the Queen yourself.

Not the most serious of adventures, but a refreshing change from the usual pixie bashes.

The humour might not be to your taste, but as long as you don't let your Granny near the monitor, it's doubtful if anyone is going to be deeply offended.

Not bad then, and with more 8th Day product being released on the CPC at £2.99 very soon, along with a disc based compilation that will bring six adventure for £6.95, adventurous Amstrad owners have quite a bit to look forward to.

**Program** *007 Superfile 2 + Listfile 3* **Type** Application **Price** £9.95 **Supplier** ZX-Guaranteed, 29 Chadderton Drive, Unsworth, Bury, Lancs. BL9 8NL.

Two filing/record programs, the latter being strictly for single line files, the former for slightly more detailed work. But the name . . . *007 Superfile.* Not licenced to corrupt, I hope.

**Program** *Shao-Lin's Road* **Type** Arcade **Price** £8.95 (tape), £14.95 (disc) **Supplier** The Edge, 36/38 Southampton Street, Convent Garden, London WC2E 7HE.

Reasonable arcade conversion job by the Edge finally finds its way onto the CPC.

**Program** *Ball Breaker* **Type** Arcade **Price** £8.95 **Supplier** CRL, CRL House, 9 King's Yard, Carpenter's Road, London E15.

The most recent of the *Breakout/Arkanoid* variants to arrive, this time in glorious 3-D.

Yes, here we have *Breakout* in side-on perspective 3-D – quite an achievement – only it doesn't quite come off as a game. Working out where to position your bat is tricky, not helped by the variable ball speed, depending how much animation is going on at the time.

A brave attempt though and certainly worth looking at for the novelty.

**Program** *Stryfe* **Type** Arcade Adventure **Price** £9.95 (tape), £14.95 (disc) **Supplier** Infogrames, Mitre House, Abbey Road, Enfield, Middx.

All the way from across the Channel and guess what? They've got *Gauntlet* clones over there too! Who said our two nations were divided by an unbridgeable cultural rift?

Sharing clones today, world peace tomorrow. I think the Common Market is great.

## BBC B

**Program** *Looking at Words* **Type** Educational **Price** £15.20 (including P&P) **Supplier** Prism Software, PO Box 211, Chester, Cheshire CH1 3NJ.

Educational program aimed at teaching primary age kids to read.

## Master Compact

**Program** *Looking at Words* **Type** Educational **Price** £16.20 (including P&P) **Supplier** Prism Software, Box 211, Chester, Cheshire CH1 3NJ.

See BBC B listing for comment.

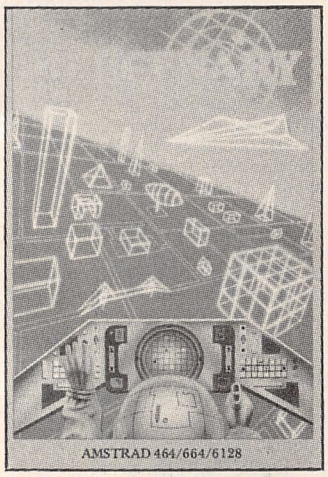
## Commodore 64

**Program** *Sailing* **Type** Strategy/Simulation **Price** £9.99

Pick of the week

## Mercenary escapism

**Program** *Mercenary – Escape from Targ* **Type** Arcade Adventure **Micro** Amstrad CPC **Price** £9.95 **Supplier** Novagen, 142 Alcester Road, Birmingham B13 8HS.




After the whizzo Atari 8-bit, Commodore 64 and, more recently, the Atari ST versions – now comes *Mercenary* on the Amstrad CPC. And it looks great.

In case you don't know, *Mercenary* combines arcade vector style graphics with a true riddle/puzzle type adventure.

The problem is that you have crash landed on this planet (I'm afraid the motor was a write off) and there you are, alone but for your friendly in-helmet 9th generation computer, Benson, who will inform you what is happening via a scrolling 'ticker-tape' section underneath the main 3-D display.

You do seem to have acquired 9000 credits though (scrap value I expect), enough to buy a ship to zap around the place and a bit to spare.

To confuse matters more, there's a war going on between the inhabitants of this world, the nice peace-loving Palyars (bet they like Genesis) and the nasty robotic alien Mechanoids. What to do, eh? Well, here it is on the CPC (lovingly recreated from the Paul Woakes original by a Dr David Aubrey-Jones).

All the elements of the original have been retained, and if you don't read every single word of *Popular* every single week and haven't got a photographic memory (coz we serialised a full solution in Arcade Action a while back) you're likely to be in for a treat.

Expect a Spectrum version to be around the end of April.

**Supplier** Activision, 23 Pond Street, Hampstead, London NW3 2PN.

The only program this week to include the massed choirs of the HMS Ark Royal plus the vocal talents of Rod Stewart? Errr . . . no, but what we have here is an excellent computer version of the America Cup yachting competition. Only they didn't call it that, maybe because, a) the program was finished too late for it to be relevant, b) after paying for the *Howard* and *Big Trouble* licences, there wasn't enough money left in the kitty.

First thing, you name the boat (no champagne supplied) and choose the country.

Remember all that fuss about the hull shapes? Design your own. Change the boat dimensions – even the material your hull is made of . . . then the races start.

You get a split screen with various instruments on the bottom half, and a view of your boat sailing on the top so realistic that I suggest those with weaker stomachs keep a bucket handy by the monitor.

**Program** *Shockway Rider* **Type** Arcade **Price** £8.95 **Supplier** Faster than Light, Sedgley Road East, Tipton, West Midlands DY4 7UJ.

Last of the *Shockway* conversions to come out from FTL – very nice too.

Plenty of action and fast with it as you attempt to go full circle around the walkways of the city.

**Program** *Jumpin' Jimmy* **Type** Arcade **Price** £2.99 **Supplier** Midas Marketing, 35 West Hill, Dartford, Kent DA1 2EL.

Get this. You're a boxing kangaroo, right, and have to collect thingies, jump round the place, knock out koala bears, avoid rattlers, stuff like that. Fun? I think the RSPCA should be informed at once.

## Spectrum

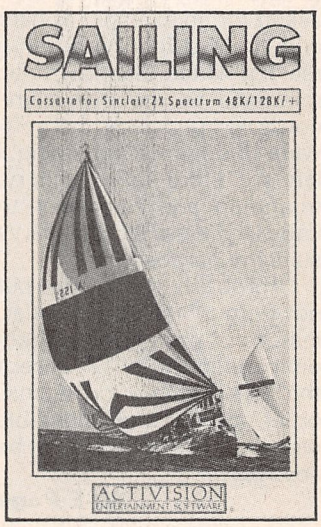
**Program** *Tomb of Syrinx* **Type** Arcade **Price** £1.99 **Supplier** The Power House, Alpha-Omega, 9 King's Yard, Carpenter's Road, London E15 2HD.

Fairly bog standard 2-D arcade adventure in which you must collect the five keys of Syrinx, go where no living man has gone before (the Ladies Room of the Conservative Club perhaps?), etc, etc.

Only outstanding feature is a free audio track on the tape, and the fact that the inlay boasts the mindboggling offer of a free poster . . . if you send them 50p and an sae. Get your mind around that one Aristotle.

**Program** *Sailing* **Type** Arcade/Strategy **price** £7.95 **Supplier** Activision, 23 Pond Street, Hampstead, London NW3 2PN.

See Commodore 64 listing for comment.




**Program** *Sceptre of Baghdad* **Type** Arcade **Price** £1.99 **Supplier** Atlantis, 28 Station Road, London SE25 5AG.

**Program** *Alpine Games* **Type** Arcade **Price** £1.99 **Supplier** Atlantis, 28 Station Road, London SE25 5AG.

**Program** *Enduro Racer* **Type** Arcade **Price** £9.99 **Supplier** Activision, 23 Pond Street, Hampstead, London NW3 2PN.

Pick of the Week in *Popular* some time ago, it's finally hit the streets. Simply the best coin-op conversion this year so far.

**Program** *007 Superfile 2 + Listfile 3* **Type** Application **Price** £6.95 **Supplier** ZX-Guaranteed, 29 Chadderton Drive, Unsworth, Bury, Lancs BL9 8NL.

See Amstrad CPC listing for comment.

## Spectrum 128/ Plus 2

**Program** *Professional Adventure Writer* **Type** Application **Price** £22.95 (including P&P) £27.95 (disc) **Supplier** Gilsoft International, 2 Park Crescent, Barry, South Glamorgan, CF6 8HD.

Full review last week but amongst other things, the program automatically configures to the machine it's being used on, fully exploiting the extra memory on the 128/Plus 2.

**Program** *Tau Ceti (Special Edition)* **Type** Arcade Strategy **Price** £9.95 **Supplier** CRL, CRL House, 9 King's Yard, Carpenter's Road, London E15 2HD.

New version of the excellent *Tau Ceti* game, in which you must knock out the rampaging defence systems left intact when the planet was evacuated after a plague.

Enhancements include Ram-Save feature.

**Program** *The Artist II* **Type** Application **Price** £17.95 **Supplier** Softek, 36/38 Southampton Street, Covent Garden, London WC2E 7HE.

Excellent *Artist II* now on the Spectrum 128/Plus 2.

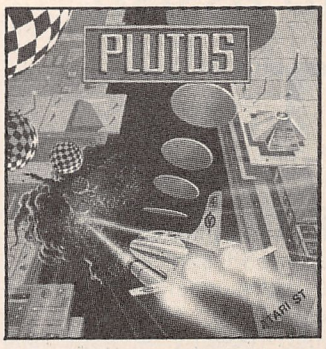
## Atari ST

**Program** *Plutos* **Type** Arcade **Price** £14.95 **Supplier** Tynesoft, Unit 3, Addison Industrial Estate, Blaydon, Tyne & Wear NE21 4TE.

Budget ST software time – and maybe the best of the crop yet from Gordieland.

Fairly run of the mill vertical scroller saved by some nice animation of the aliens and a two player option that has you competing against each other on-screen for the goodies.

A tad more speed would have been appreciated, but for the price, this is a gem.




**Program** *Trailblazer* **Type** Arcade **Price** £24.95 **Supplier** Gremlin Graphics, Alpha House, Carver Street, Sheffield.

An 8-bit classic reaches the ST – and to be quite honest, it's a bit of a disappointment. The scrolling is fine, the colours are good – yet mysteriously, the two player option (with split screen top and bottom, just like the other versions) doesn't seem to allow you to view your opponent (just like the others do). Ummmm – I think there's something wrong here.

**Program** *Macadam Bumper* **Type** arcade **Price** £24.95 **Supplier** Infogrames, Mitre House, Abbey Road, Enfield, Middx.

Ere Infomatique ST games over here courtesy of Infogrames – the first being that Pinball construction program, *Macadam Bumper.*

There are those amongst us that question the validity of a computer pinball simulation which, they say, can never come anything close to the feel of the real thing.

I can identify with that – but *Macadam* comes closer than most, even allowing you to 'shake' the table by vibrating the mouse up and down. Luckily there doesn't seem to be a tilt function.

The five or so tables that are already on the disc are OK, but I'd think that the package comes into its own if you go in for constructing custom pins.

I would have preferred more instructions, but you'll probably like it all the same.

# Discount versus service–

## *or, why are shop assistants never able to assist?*

The micro industry is relatively new and as such may (perhaps) be forgiven for not quite having its act together yet. Newish professions are prone to this. It takes a long time for workable codes of ethics to be established and adhered to – as we have seen in the City just recently – especially when there is a fast buck at stake.

There can really be little excuse though for the abysmal service afforded by many micro retail outlets. It isn't just that they don't know what they are doing; they don't seem to care either. The salesman who knows little or nothing about the hardware or software he is selling appears to be the most common problem but even more infuriating is the one who does know his product but is more concerned with demonstrating how clever he is than in providing a service.

Alan Sugar's approach to marketing his product is admirable. Getting it into the high street seems to be the way to make the present generation computer literate. Hopefully the schools will take note of the next. But if the micro-computer is going to be successfully marketed in the high street of every town then the retail electrical industry must pull itself together and provide proper training for its sales staff.

> *"It isn't just that the outlets don't know what they are doing; they don't seem to care either"*

Of late I have been seriously considering the purchase of a 'Joyce' PCW. So far I have visited three different shops in the hope of getting both meaningful advice and 'hands on' experience of the machine.

In the first, a specialist outlet, the supercilious salesman blinded me with science – which I am neither interested in nor have any particular talent for – and I left the establishment without even seeing the machine booted up let alone getting my hands on it.

In the second, a well known chemist's who also sells everything else under the sun, the bored sales assistant couldn't even summon the energy to talk to me in terms other than monosylabic.

My interest in a PCW on display in the third, a large electrical retailers, immediately drew the attention of the manager who offered the services of his 'computer man'. This very courteous chap showed promise until I asked him to demonstrate Locoscript to me. He booted it successfully and managed to load a demonstration file with the help of frequent reference to the manual, but when I asked for an example of hard copy in NLQ font he got into real hot water. Despite frantic reference to the manual he could not persuade the software to download anything. I left the store feeling angry, frustrated and no closer to knowing whether the PCW suits my purposes or not.

I'll probably still buy one but not from a high street outlet. Instead of paying the full recommended price I'll accept the deal offered by a mail order outfit at a considerable discount. The service can't be any worse!

**W E Page**

# NEXT WEEK

## SPECIAL SUPPLEMENT

### Computer music

**All the latest news on music software for the Spectrum, Commodore 64, PC compatibles and Atari STs. Plus an in-depth review of a range of Midi sequencing software from Passport, and a look at US musical bulletin boards.**

### Commodore add-ons

**A new case for your old 64? Give your traditional-style 64 the all-new 64C look. Then you can add a high speed disc drive and complete the set. Both products courtesy of Evesham Micros, both tested thoroughly in *Popular* next week.**

### ST Sprite Designers

**Eidersoft's *Pro Sprite Designer* and Microdeal's *Sprite Construction Kit* compared.**

## Hackers

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