POPULAR Computing WEEKLY

Only 45p.

29 August-4 September 1985

It's the best selling weekly

Vol 4 No 35

PERSONAL COMPUTER WORLD SHOW PREVIEW

Sinclair slashes QL price in half

SINCLAIR has slashed the price of its QL micro down from £399 to £199.95.

The new price comes into effect from September 2.

Jane Boothroyd, Sinclair's UK sales and marketing manager, said, "We have reduced the price of the QL to consumers in line with reduced manufacturing costs. We will achieve major savings from our substantially increased manufacturing volume, based on sales commitments received to date and more in the pipeline."

The QL price reduction comes just two days after Amstrad formally unveiled its disc-based 6128 and PCW 8256 machines at £399 and £459, respectively. Following the QL price drop the combined price of the QL and 3½ inch disc add-on comes down to £488.95.

The move not only re-establishes Sinclair's claim that the QL is a true low-cost business machine, but could also pave the way for a new QL-based model (see *Popular Computing Weekly*, August 22).

Since its launch in January

continued on page 4 ▶

CPC 664 is now "truly dead"

AMSTRAD has now officially announced it is to drop its CPC 664 disc-based micro.

With the 128K version—the CPC 6128—already in the shops, and the new PCW 8256 launched last week (see *Popular Computing Weekly*, August 22) Alan Sugar, Amstrad's chairman and managing director, said "The 664 is now well and truly dead.

"It was a natural progression from the 464, but it suffered from a leap in micro technology."

As the 6128 is to sell for £399 (colour) and £299 (monochrome) the prices of the 464 model have been cut to match. The colour monitor version of the 464 comes down from £349 to £299 and the monochrome monitor version comes down from £239 to £199.

The new desk-top word processing mod-

cont on page 4 ▶

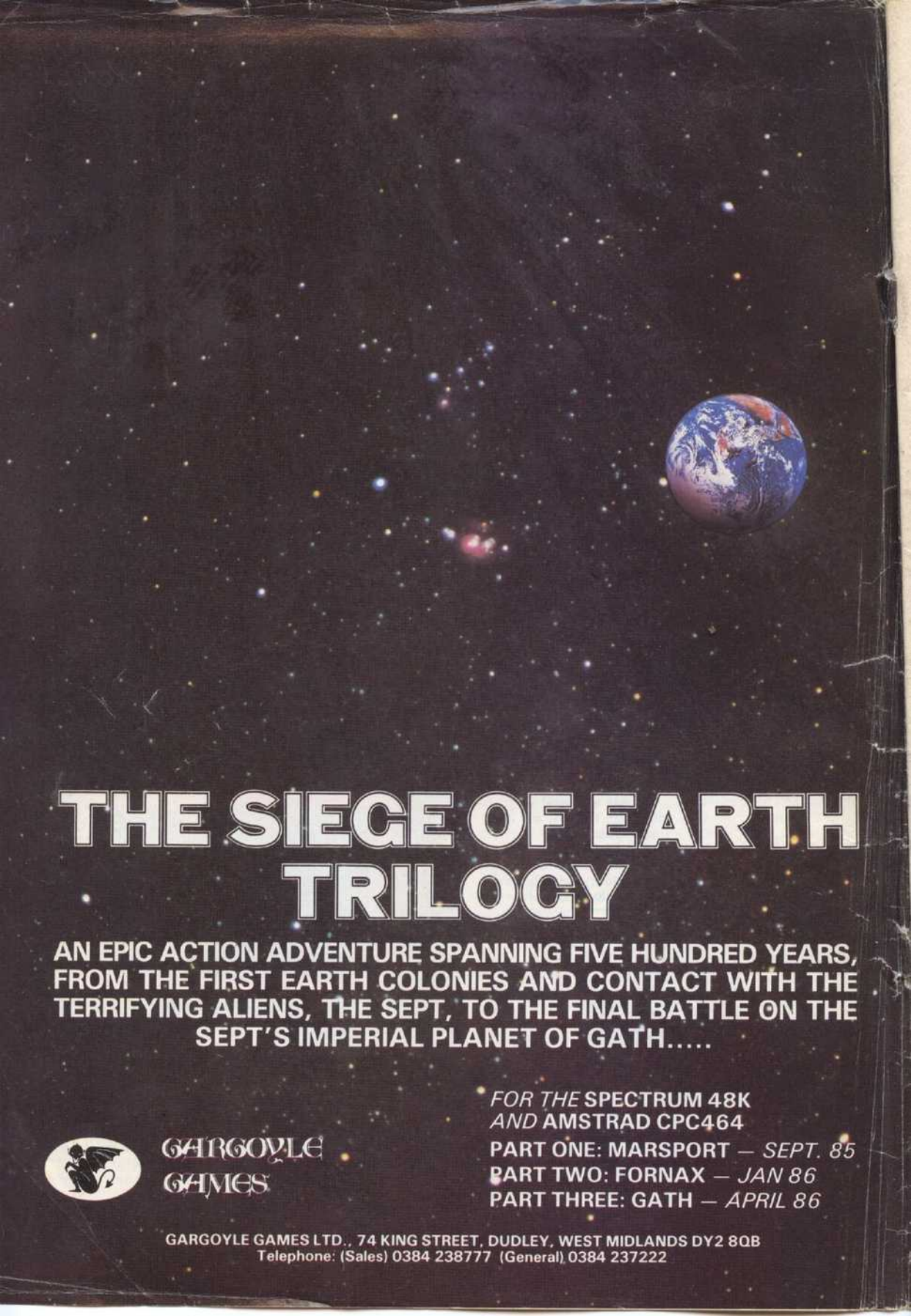
NEW AMSTRAD 8256 EXPOSED

All-in-one: micro, disc, monitor and printer

NIGHTSHADE, Ultimate's long awaited Spectrum title has now been released. It features 'Filmation 2', said to be an enhancement of the 3D system featured in Knight Lore and Alien 8.

Played in a background of tudor houses, archways and other buildings the game involves finding four special weapons and using them to kill four specific monsters. The game – very much in the arcade mould – is priced at £9.95.

INSIDE ⟩ WARLORD – A CELTIC SKIRMISH IN PICK OF THE WEEK ⟩


THE SIEGE OF EARTH
TRILOGY
AN EPIC ACTION ADVENTURE SPANNING FIVE HUNDRED YEARS, FROM THE FIRST EARTH COLONIES AND CONTACT WITH THE TERRIFYING ALIENS, THE SEPT, TO THE FINAL BATTLE ON THE SEPT'S IMPERIAL PLANET OF GATH.....
FOR THE SPECTRUM 48K
AND AMSTRAD CPC464
PART ONE: MARSPORT — SEPT. 85
PART TWO: FORNAX — JAN 86
PART THREE: GATH — APRIL 86
GARGOYLE GAMES
GARGOYLE GAMES LTD., 74 KING STREET, DUDLEY, WEST MIDLANDS DY2 8QB
Telephone: (Sales) 0384 238777 (General) 0384 237222

CONTENTS

Vol 4 No 35

4 NEWS
Acorn's world beating chip

5 SHOW PREVIEW
What to look out for at the *Personal Computer World* show

9 MACHINE PREVIEW
John Cook finds how Amstrad means business with the PCW 8256

13 SOFTWARE REVIEWS
Cylu on Spectrum – Project Planner on QL

16 STAR GAME
High speed action on Spectrum 48K

18 BBC AND ELECTRON
Your last helping of Pandemonia code for BBC B

20 THE QL PAGE
Multi-purpose graph plotting concluded

23 AMSTRAD
Simple animation for Amstrad owners

24 COMMODORE 64
Voiced numbers with the Currah Speech unit

Show time. For a preview of next week's *PCW* show see page 5

6 Letters
26 Arcade Avenue
27 Adventure Corner
28 Peek & Poke
34 Adventure Helpline
35 Top Ten Charts
36 This Week
36 New Releases
38 Puzzzle, Ziggurat, Hackers

EDITORIAL

This time next week the 1985 *Personal Computer World* Show will be in full swing. Over the last eight years the show has emerged to become the number one showcase for the industry's new products.

In fact most companies have been working round the clock to get previews and demo versions ready of the new hardware and software intended for sale at Christmas.

It is strange – given the prevailing climate of doom and gloom in some quarters of the micro world – but this year's show promises to be the most exciting in four years.

In contrast with last year's show it looks very unpredictable with possibly more than nine new micros being shown for the first time.

The biggest question marks will be hanging over the Sinclair stand. The company has in recent weeks struggled through a severe cash crisis to emerge perhaps bearing not one but two new computers. From Sinclair's point of view the *PCW* Show will give the first indications of whether the new products – expected to be new Spectrum and QL derived machines – will capture the imagination of the public the way the Spectrum did in 1982. Sinclair needs to make a big success of the show.

Other stars expected to be shown include Atari's strong contender the 260 STD – for the first time in public. And Amstrad will show its price-busting PCW 8256 – also for the first time – together with the 6128.

It's not just the micros that *will* be there that are interesting. There may be a number of significant omissions. It seems doubtful that Acorn, for example, will launch its successor for the BBC micro at the show. And strangely, Commodore seems to be pinning all its hopes for this year on the now rather overpriced C128 when the machine everyone wants to see is the Amiga. The Amiga launched in a blaze of publicity in the US last month, is apparently not being shown in public for fear it would overshadow the C128. A wise decision – it would.

This *PCW* Show is the most important for five years – it will show the direction that all the major manufacturers will be taking over the next crucial eighteen months. Success or failure.

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

ABC

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

Popular Computing Weekly. Tel: 01-437 4343.

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

Computer Trade Association Magazine of the Year

Acorn claims world first for new chip

ACORN is claiming a world first with the announcement of the first production models of a revolutionary 32-bit microprocessor.

Acorn has beaten a number of major chip companies to be the first to produce what is termed an RISC processor chip.

RISC stands for Reduced Instruction Set Computer technology—as opposed to CISC (Complex Instruction Set) which most chips up until now have been based on. Making the chip's instruction simpler increases the speed at which it can operate. Prototypes of the Acorn RISC device can handle up to 3m instructions per second.

"RISC is nothing new as a theory," explained Mark Carrington, marketing analyst at Acorn's Business division. "Research into RISC architecture has been going on at Stanford and Berkeley Universities and also IBM's Yorktown Heights research centre in the US."

Acorn however is the first company to put such a chip into production. Development was completed by a team of VLSI (very large scale integration) technology engineers who joined Acorn shortly after its first reshuffle in February this year.

Acorn's 32-bit RISC chip will now be developed further internally, before being used in machines. It would theoretically be suitable for implementation in the recently launched Cambridge Workstation, but Mark Carrington would not comment on whether such a move was planned.

New printer for Amstrad

AMSTRAD has announced a new printer to be used with both the 464, 664, and the new 6128 micro.

The new dot-matrix model – the DMP 2000 – prints at 105

cps (characters per second), and takes both single sheet and continuous feed paper.

The printer will also operate with any micro which uses a standard Centronics parallel interface. It will be available in October and costs £159.95.

Ex-Quicksilva chief to launch new label in September

ROD COUSENS, ex-managing director of Quicksilva, and former vice-chairman of the Guild of Software Houses, has set up his own new software company.

Called Electric Dreams Software, three programs will initially be released, to be previewed at the *Personal Computer World* Show and on sale in October.

The first three are *Riddlers Den*, an arcade strategy game for the Spectrum, which will be priced at £7.95, *I of the Mask* for the Spectrum (£9.95), which is being written by *Ant Attack* author Sandy White, and features advanced 3D graphics, and a sports simulation for Spectrum and Amstrad at £9.95.

"We have been set up as a division of Activision," Rod explained, "but we are based

Rod Cousens

Sandy White

in Southampton, and will be quite autonomous, doing our own marketing and so on. It is possible we may be able to export our programs to the States through Activision US.

"There are some Commodore titles also in development, and we plan to respond closely to the market – so we may not necessarily be just a games house."

Spectrum Elite has novel protection

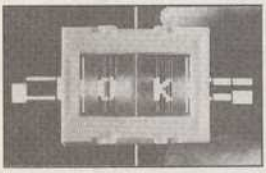
FIREBIRD'S version of *Elite* for the Spectrum – now scheduled for late September – will be the first commercial product to use Lenslok, a new anti-piracy device.

Each copy of *Elite* will be packaged with a special Lenslok lens, which acts as an on-screen 'unscrambler'.

Before playing a game of *Elite*, the program will randomly generate two figures the matrix of which has been scrambled. The user will only be able to see the two characters by looking at the screen through the Lenslok lens, which alters the refraction from the screen. The user must then type in the two characters, and only if they are correct will the game proceed.

Tony Rainbird of Firebird said, "We are also planning to use Lenslok on *Booty* for the QL. It seems particularly important to protect QL programs in this way, since you need to make a back-up microdrive so any device which prevents audio copies is no good.

"However, we haven't committed ourselves to putting Lenslok on all our ti-



Lenslok

tles – we'll see how *Elite* on the Spectrum goes first."

The manufacturer of Lenslok, ASAP Developments, has also had discussions with Ocean, US Gold, Ultimate and Acornsoft.

PCW 8256

continued from page 1

el, the PCW 8256 will be available in Dixon's and a large number of independent stores in September, at £458.85. It will also be available then through office equipment distributors, directly to companies.

Up until the end of December, Dixons will have "an element of exclusivity", according to Alan Sugar, being the only high street chain to stock the machine. From the beginning of next year, the PCW 8256 will be available in other high street stores. By then Amstrad will be able to produce enough PCW machines to keep up with demand.

Amstrad claims to have sold 200,000 computers in 1984 worldwide, and is aiming for 600,000 in 1985.

QL cuts

continued from page 1

1984 sales of the QL have been disappointing. Early teething problems did little to help the machine and so far world-wide sales have only reached around 60,000.

Recently the machine has suffered heavy discounting in some stores to clear stocks.

Sinclair continued discussions with its major creditors throughout last week, although so far, the terms of repayment to creditors remain unchanged.

The major creditors are Thorn-EMI, Timex, AB Electronics, Barclays Bank and Citibank.

The talks, which are expected to reach a conclusion within the next two weeks, were described as an "ongoing confidence building exercise," by a Sinclair spokesman.

Showing off

Christina Erskine *looks at what's likely to be on offer at next week's* PCW *show*

This year's *Personal Computer World* Show — the eighth, which runs from September 4-8 at Olympia in West London, promises to be very exciting.

Most of the home orientated companies will have stands in the National Hall, Olympia, with business firms generally in Olympia 2.

Sinclair Research is widely expected to show some new products, and to put on a convincing display that its troubles of the last months are over. It seems likely that an expanded memory version of the Spectrum will be shown, possibly a 512K version of the QL, and maybe even a glimpse of Pandora, the Spectrum portable. A QL mouse is in the offing, too.

Sinclair is keeping quiet about its plans for the show and will only confirm that all its existing products will be there, plus the latest software for the QL.

520 ST – at last

Atari will be taking a large stand to accomodate around 50 third-party software houses showing ST programs. The show will mark the first public showing of the 520ST in this country, and Atari has also promised the first view of the 260STD with built-in disc drive and its compact disc Rom data storage system.

The show should mark the beginning of genuine availability of the 520ST in the shops, as Atari builds up its production capacity. The 260STD is still expected to reach the shops before the end of the year and Atari is hoping the CD Rom Player — a first for a home system — will be out by Christmas.

Amstrad will be showing its full complement of micros. The new PCW 8256 will get its first public showing, and Amstrad will also be highlighting the business capabilities of the 6128. The 664, though it will be there, will be taking very much a back seat.

Commodore is dividing its stand in two — music featured strongly on one side and the new C128 on the other.

Music software on show includes *Music Maker 64*, and the new *Music Maker 128, Sound Sampler, Sound Expander* — which gives the C64 eleven voices — and the full range of Playalong albums, all from Music Sales.

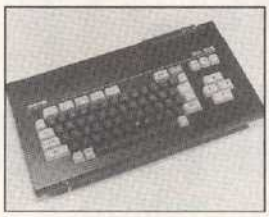
The C128 will be shown with software running — from Commodore itself comes a word processor (a modified version of Precision's *Superscript), Microclerk*, an accounting package, *Personal Money Management*, and two games, *Mandroids* and *Pazazz*.

Some CP/M software should also be up and running on the C128, and Commodore is also, like Atari, giving space to third party companies. CP/M distributors Softworld, utility house Vizasoft, educationalists ASK, and again Music Sales will all be there.

All the new peripherals running with the C128 will be shown: the 80-column monitor, the 1571 disc drive and the mouse controller.

For reasons best known to itself, however, Commodore has decided not to show the exciting new Amiga model in public. Commodore seems to be worried that it would overshadow the C128.

Commodore claims that the conversion from the US TV standard NTSC to PAL means the Amiga cannot be released over here until January. The machine may however be shown to a select audience of retailers and commentators.



Toshiba's HX-22 MSX

The MSX manufacturers will all be represented on one MSX stand. A number of enhanced MSX machines featuring 128K video Ram, with a up its sleeve, although interestingly, only 128K models will be shown. A new colour monitor will be shown for the first time, as will the Enterprise mouse, commissioned from Aztec Software at £49.95. The main emphasis will be on its disc controller (£99).

"This will connect any 3½ inch or 5¼ inch drive to the Enterprise. It will also give file compatibility with MS-DOS and full CP/M compatibility," said product manager Steven Gandy.

The company is also hoping to be able to show 60 software titles, including an original Enterprise adventure, *The Seventh Seal*, which runs on the 128K machine.

Acorn is fully expected to unveil the Communicator, its answer to ICL's One Per Desk, with built-in telephone / modem and software. The Cambridge Workstation, 32016 second processor for the BBC and the BBC B Plus will also be exhibited. It is unlikely, though, that it will be ready to preview its BBC B Plus successor in time.

The *PCW* Show is the time when many software houses reveal their Christmas releases, whether in prototype or finished form.

Beyond has promised that *Superman* will fly for the first time in this country at the show, and *Eye of the Moon* and *Enigmaforce (Shadow-Fire II). Nexus* and *Iron Heroes* should also be making their debut.

Ocean will be previewing its version of fun-loving Sylvester Stallone's *Rambo: First Blood Part II, Transformers* and *Knight Rider*.

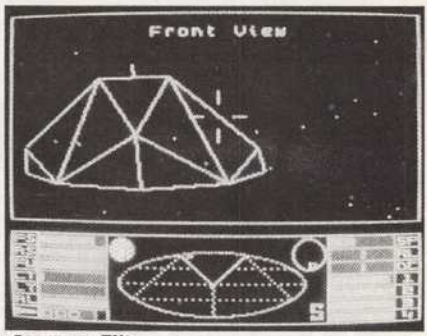
US Gold is planning to link its booth up with Ocean's to create one mega-stand, and show for the first time in Britain a prototype of Epyx's *Winter Games*, Datasoft's movie tie-up *Goonies* and the licensed Disney titles. *Summer Games II* will also be a sure-fire crowd puller.

Also bound to be attracting the crowds is Melbourne House, with the first part of *Lord of the Rings*, which

Mega-stand

should reach the shops this autumn. Three separate *Lord of the Rings* adventures will eventually be released, corresponding to the parts of Tolkien's trilogy. *Terrormolinos* — the package holiday spoof from the authors of *Hampstead* — is also being launched.

Firebird has found space on its stand to allow Birtish Telecom's implementation of MUD to run throughout the show, while Firebird itself will be showing *Elite* on the Spectrum for the first time.



Spectrum *Elite*

Level 9 has a new adventure to preview — *Worm in Paradise*. Not an 'easy' one like *Red Moon* or *Emerald Isle*, this completes the *Snowball/Return to Eden* trilogy, will cost £9.95, and will be available for most micros.

Metacomco will launch a C implementation for the QL to round up its highly acclaimed language range for that machine, and also show an Assembler/Editor for the Atari 520ST. Sadly, Metacomco will not be displaying its Amiga software.

Mirrorsoft will have its *Spitfire 40* conversion for the Spectrum on show, and also *Ninja*, a martial arts arcade title.

Psion, whose name has been linked with so many quality Sinclair products at *PCW* Shows past, is concentrating far more on its Organsier pocket micro this year, and showing *Xchange*, its suite for business machines. There is still no sign of Flight, its long running flight simulation project for the QL.

Letters

Speculative

Congratulations on a fair review of the 6128; on the whole this was very good, except for one or two small inaccuracies.

I am sure the comment about the spare ULA socket is going to fuel quite an amount of speculation. Unfortunately it is nowhere near as exciting as the review may have suggested. In production, we use two different manufacturers ULA chips, each of which have slightly different external clock circuitry and driver chips – for this reason, two ULA sockets are provided on the board.

The new CP/M on the machine is Plus (3.0), not 3.1.

Pip has not been re-written in any way – it is absolutely standard.

The facility that allows the single drive to be treated as both A: and B: is buried deep within the BIOS, so that any application program that would usually require two drives may be used (though there may be a lot of tedious disc changes). For example, try typing *Dir* B: on a single drive system.

Cliff Lawson
Software Engineer
Amsoft
Brentwood House
169 Kings Road
Brentwood

Just a joke

How dare you say in your review of *Beatles Quest* that the Beatles were nearly as famous as Duran Duran!

Duran Duran have been making records for about six years. During that time the Beatles: 1) sold over 150m records; 2) had 10 consecutive No 1 hit singles; 3) eight consecutive No 1 LPs; 4) made three feature films. Has Duran Duran ever done any of this? The answer is no.

Your reviewer should crawl back into the slime-pit from which he came. You've just lost one of your readers. I would rather read *Woman's Own*.

"Is it RISC capital that Olivetti's injecting into it, Dad?"

K J Walker
103 Ribble Road
Blackpool

It was a joke . . . honest. What we meant to say was that the Beatles were almost as famous as Haircut 100.

User group

I am interested in contacting users of ACT computers, particularly the Apricot/F1/Portable range, with a view to starting a national user group. The idea would be to cover the full range of computing with things of interest to business, home and educational users.

If anyone would like further details please write to me enclosing an sae.

F S Cartwright
Rockside
13 Worley Ridge
Nailsworth
Glos
GL6 0PD

Walkabout line

Whatever happened to Line F860 in Simon Nichols' ZX Basic Code. Vol 4 No 33 ends with F858, yet Vol 4 No 34 starts with F868! What is the meaning of this... the public have a right to know!

A Hall
Bethnal Green
London E2

I'm afraid that line inadvertently went walkabout between weeks. It has now been recaptured, and we can reveal its contents: F860 29 F8 CD 58 F8 2A 0E 5C = D2. Our apologies to all frustrated Spectrum users.

HI-VOLTAGE
COMMODORE SALE

	Old Price	New Price
C64 Computer	£199.95	£149.95
1541 Disk Drive	£189.95	£139.95
MPS801 Dot Matrix Printer	£160.89	£99.95
MPS803 Quality Dot Matrix Printer	£239.95	£149.95
DPS1101 Daisy Wheel	£356.39	£199.95
Easy Script Word Processing Disk	£49.95	£19.95
C64 + 1541 + Easy Script	£389.95	£289.95
C64 + 1541 + MPS801 + Easy Script	£550.85	£349.95
C64 + 1541 + DPS1101 + Easy Script	£796.24	£489.95
C64 + C2N + International Soccer (Holiday Pack)	£199.95	£189.95

All Prices Include VAT
Personal Callers or Mail Order
Mail Order + Export + Trade

Hot Line Phone 01-686 6362

Delivery by Securicor (3 day) please add £5.00 + VAT per item.
Delivery by T.N.T. (Overnight) please add £9.50 + VAT per item.

HI-VOLTAGE
53-59 High Street, Croydon,
Surrey CR0 1QD. Tel: 01-686 6362
PO550s

GOOD BYTE

SPECTRUM

GAME	RRP	OUR PRICE
FRANKIE G. T. HOLLYWOOD	9.95	6.99
A VIEW TO A KILL	10.99	7.99
SPY vs SPY	9.95	6.50
DUN DURACH	9.95	6.99
EXPLODING FIST	8.95	6.75
STARION	7.95	5.95
HYPERSPORTS	7.95	5.25
WORLD SERIES BASEBALL	6.95	4.95
BATTLE FOR MIDWAY	9.95	6.99
NOW GAMES	8.95	6.75
CAULDRON	7.99	5.99
SHADOWFIRE	9.95	6.99
AZIMATE 3000	4.99	3.95
ANIMATED STRIP POKER	6.95	5.25
ROCKY HORROR SHOW	8.95	6.50
ROCKFORDS RIOT	9.95	7.50
JET SET WILLY II	6.75	5.25
BORED OF THE RINGS	6.95	5.25
MATCH DAY	7.95	5.50
HIGHWAY ENCOUNTER	7.95	5.50
RED MOON	6.95	5.25
NICK FALDO'S OPEN	9.95	6.99
BATTLE OF BULGE	9.95	6.99
JUGGERNAUT	7.95	5.95
TALOS	7.95	5.95
DYNAMITE DAN	6.95	5.25
THATS THE SPIRIT	6.95	5.95
FAIRLIGHT	9.95	6.99
ROBIN OF SHERWOOD	9.95	7.50
SOUTHERN BELLE	7.95	5.75
5S COMPILATIONS (PSS)	4.99	3.75
INTERNATIONAL KARATE	6.50	4.25
CYLU	2.50	1.75
FRANK BRUNO'S BOXING	6.95	5.25
PSYTRON	7.95	3.99
PROFINATION	7.95	5.60
CODENAME MAT II	8.95	6.75
TRIVIA	7.95	5.95
TERREMOLINOS	8.95	5.25
DOOMDARK'S REVENGE	9.95	4.99
EXPLODING FIST	6.95	6.50
NOW SOFTWARE	8.95	6.50

COMMODORE

GAME	RRP	OUR PRICE
FRANKIE G. T. HOLLYWOOD	9.95	6.99
WAY OF EXPLODING FIST	9.95	6.99
VIEW TO A KILL	10.99	7.99
ELITE	14.95	11.00
NOW GAMES	8.95	6.75
JUMP JET	9.95	7.50
GRAHAM GOOCH'S CRICKET	9.95	6.99
HYPERSPORTS	8.95	5.99
THEATRE EUROPE	9.95	6.50
COMBAT LYNX	8.95	6.50
PSYTRON	7.95	3.99
TERROMOLINOS	6.95	5.25
SKYFOX (cassette)	9.95	7.50
WIZARDRY	9.95	7.50
CONFUZION	6.95	4.99
CODENAME MAT II	8.95	6.75
JOURNEY	7.95	5.95
JET SET WILLY II	8.95	6.50
WORLD SERIES BASEBALL	7.95	5.25
CAULDRON	7.99	6.50
RED MOON	6.95	5.25
NICK FALDO'S OPEN	9.95	6.99
BATTLE OF THE BULGE	9.95	6.99
THING ON A SPRING	7.95	5.95
ROBIN OF SHERWOOD	9.95	7.50
5S COMPILATION (PSS)	4.99	3.75
BEACH HEAD II	9.95	7.50
WIZZARDRY	9.95	7.50
WIZZARDSLAIR	8.95	6.75
INTERNATIONAL KARATE	6.50	4.25
CYLU	2.50	1.75
FRANK BRUNO'S BOXING	7.95	5.95
NODES OF YESOD	9.95	7.50
PSI WARRIOR	9.95	3.99

AMSTRAD

GAME	RRP	OUR PRICE
COMBAT LYNX	8.95	6.50
CONFUZION	6.95	5.25
EXPLODING FIST	9.95	7.50
ANIMATED STRIP POKER	8.95	6.50
VIEW TO A KILL	10.99	8.99
SORCERY	8.95	6.50
DARK STAR	7.95	5.95
3D STARSTRIKE	6.95	5.25
DUN DURACH	9.95	6.99
TANK BUSTERS	7.95	5.95
DRAGONTORC	7.95	5.95
RED ARROWS	9.95	6.99
RED MOON	6.95	5.25
AIR WOLF	8.95	6.99
FRANK BRUNO'S BOXING	8.95	6.99
EVERYONE'S A WALLY	9.95	6.99
BRIAN BLOODAXE	8.95	6.75
ALL AMSOFT DISKS	12.95	9.95

SPECIAL OFFER QUICKSHOT II £6.50

ALL PRICES INCLOUE P&P

PLEASE NOTE IF OUR ORDER EXCEEDS £50 YOU GET 10% FURTHER DISCOUNT
SEND CHEQUES/P.O. TO
GOODBYTE PCW10
94 LEATHER LANE, LONDON EC1
(TEL: 01-404 4245)
THIS IS JUST A SMALL SELECTION FROM OUR STOCK—PHONE FOR ALL YOUR SOFTWARE NEEDS
PO359

WATCH OUT! IT'S

DYNAMITE DAN

94% Crash Smash

THE No. 1 HERO OF 1985

Popular Computing Weekly Pick of the Week

COMING NOVEMBER ON
COM 64 AND AMSTRAD
48K Spectrum/Spectrum + £6.95

MIRRORSOFT

Maxwell House, Worship Street, London EC2A 2EN. Tel 01-377 4600
Trade orders to: Purnell Book Centre, Paulton, Bristol BS18 5LQ. Tel 0761 413301

SKYFOX

NOW AVAILABLE ON CASSETTE FOR CBM 64

1985 AWARD WINNING U.S. TOP 10 HIT

◄ OUT OF YOUR COCKPIT WINDOW AS YOU SWOOP DOWN TO TAKE OUT SOME TANKS

ENEMY PLANES ATTACK ► SUDDENLY WITH DEADLY FORCE

THE ACTION-PACKED COMBAT SIMULATION

'SKYFOX' is the most realistic awe-inspiring combat simulation you've ever seen on your computer. *'SKYFOX' special features include –*

- ***AIR TO AIR & AIR TO GROUND COMBAT***
- ***3D SCROLLING FLIGHT SIMULATION***
- ***15 SCENARIOS*** (from training mission to massive invasion)
- ***5 SKILL LEVELS*** (from cadet to ace of the base)
- ***AUTO PILOT FEATURE FOR LAUNCH & ENEMY SEARCHES***
- ***ON BOARD & BASE TACTICAL-COMBAT COMPUTERS***
- ***CONTINUOUS LASER CANNONS***
- ***HEAT-SEEKING & GUIDED MISSILES***
- ***JOYSTICK & KEYBOARD CONTROLS***

"SKYFOX" NOW • GET "SKYFOX" NOW • GET "SKYFOX"

Available for the Apple II, II+, IIc, IIe, & Commodore 64/128 on Disk, and NOW CBM 64 Cassette.

Available from all good software retailers – *if its not there, please order it – or in case of difficulty send your crossed cheque/P.O. made out to* **Ariolasoft U.K. Ltd.**, *including your own name and address, to Ariolasoft U.K. Ltd., Suite 105/106, Asphalte House, Palace Street, London SW1E 5HS.*

► ***SKYFOX*** – *Commodore Cassette* **£9.95**, *Disk* **£12.95** ► ***SKYFOX*** – *Apple Disk* **£17.95**

ariolasoft

HIGH PERFORMANCE PROGRAMS

And the word was Amstrad

Amstrad means business with the launch of the PCW 8256. ***John Cook*** *investigates the bumper bundle*

Last April, Amstrad Consumer Electronics – headed by Brentwood's answer to Jack Tramiel, Alan Sugar – entered the home computer marketplace with a product called the CPC 464.

Fifteen months and a claimed 200,000 units later, even the harshest of critics would have to grudgingly admit that Amstrad is doing well.

The reasons for that success are simple: the simplicity of everything-in-one-box and competitive pricing achieved by overseas manufacture.

Having now made its mark in the home computer market Amstrad has moved on to try its hand in the lucrative business and office systems market.

Last week it announced the Personal Computer Wordprocessor (PCW) 8256. What you get in the package is a green-screen monitor with built-in disc drive, a professional keyboard, 256K of Ram, software, and a printer – all for £459. When Amstrad's Chairman suggests that this machine will "blow the lid off the personal computer and word processing market", he might not be wrong.

Hardware

The monitor provided is green screened, displaying 90 columns on 32 text lines. The display is crisp and clear, as you might expect, and a brightness control is situated flush under the right-hand side of the console. Built in to the upper right of the unit mounted vertically is the disc drive. Amstrad have retained the 3-inch floppy format, giving about 180K of storage on each side after formatting. There is space on the lower right of the monitor unit for a second disc drive to be fitted, a 1 Megabyte 3-inch floppy, which should provide an extra 720K of formatted storage. Available by late November, this would be fitted by a dealer – for the sum of £159.

The main circuit board, about the size of an A5 sheet of paper, sits between the television tube and the disc drive towards the rear of the unit. The Z80A processor lies at its heart, with 256K of Ram, 112K of which is used as a Ram disc when running software under CP/M. There is virtually no on-board Rom, as one Amsoft employee explained, "There's just a short bootstrap and that's it. It's a totally clean machine." On the same board are the disc and printer controllers and some interfacing circuitry, plus a novel gate array.

The whole monitor/drive unit (which includes the power supply/transformer as in the other Amstrad machines) sits on a small pedestal, slightly reducing its footprint.

The 82-key keyboard has a normal Qwerty layout to the left, and a selection of function keys on the right, which can double as a numerical keypad. It has a nice feel to it – light but responsive – and shouldn't give too many problems to the touch typists it is primarily aimed at. The whole thing is connected to the monitor via a single spiral-cord connection.

Non-standard characters (such as those used in continental languages and scientific notation) can be obtained by simultaneously pressing *Alt* or *Extra*, plus the appropriate key – a useful feature.

The printer is manufactured by the established manufacturer Seikosha. It is dot-matrix and seems to perform well. In its letter quality mode (probably a fair description – especially with a good ribbon) it prints at 20 characters per second, increasing to 90 cps in draft quality.

The complete PCW 8256 system

When running under CP/M it emulates an Epson, and supports both single sheet and tractor feed operation. You won't be able to use it with your existing computers however. The printer is just a printer mechanism, with the printer driver hardware located on the main board. It connects to the main computer/display unit via two cables – one power, the other ribbon.

That's the basic set up. As well as the disc upgrade mentioned, a combined serial and parallel interface should be available by late September, costing £69. This would allow access, via a modem, to the main electronic mail and information systems, such as BT Gold, plus facilitating the use of serial printers. This will be bundled with the suitable operating software.

Memory upgrades are technically possible, but Amstrad has no plans to explore that avenue at present.

Over 3000 software packages have been written to run under CP/M. The following is a selection of key packages which are available for the Amstrad:

Utilities

Devpac 80	£39.95
DiscDoctor	£12.95
ED80 (Screen Editor)	£29.95
Microsoft Macro Assembler	£225

Languages

Mallard Basic	£99.00
Nevada Basic	£39.95
Nevada Fortran	£39.95
Nevada Pascal	£47.00
Pascal80	£39.95
Nevada Cobol	£39.95
Nevada Pilot	£39.95

Graphics

Viewspread (Saxon)	£29.95

Financial Modelling

Microspread II	£49.00
Cracker (Software Technology)	£49.00
Supercalc 2	£49.95

Word Processing

NewWord (with Spell Plus)	£149.00
Wordstar	£295.00

Database Management Systems

Cambase Plus	£39.95
DBase II	£395.00

Training Software

Hisoft CP/M Tutorial	£12.95
Touch 'n' Go	£56.00

Software

Any machine that calls itself a wordprocessor must surely rise or fall on the quality of the wordprocessing software supplied with it. The PCW 8256 comes with *LocoScript*, a new package written specially for the machine by Locomotive Software. Members of the Locomotive development team are no strangers to writing wordprocessors – a number previously had a hand in developing the Diamond system, very much a top-flight machine.

The system is genuinely easy to use. On booting up (this is just done by turning the machine on and inserting the correct disc), you are presented with the disc management screen (a detailed directory). From there on, documents are

Continued over the page

Amstrad PCW 8256 Specification

Processor: Z80A
Ram: 256K (32K available to Basic)
Rom: Bootstrap loader only
Disc (built in): Hitachi Format 3 inch
Disc operating system: CP/M Plus
Disc software included: *Loco Script*, CP/M, Dr Logo, DR GSX, Mallard Basic
Display: 90 columns by 32 lines
Colour: None
Sound: None
Printer: Dot-matrix 90 cps (20 cps in near-letter quality mode)
Price: £459

created or edited by using single keystrokes and cursor controls. Extensive use is made of window menus, backed up by excellent documentation. Within a few minutes it is possible to produce recognisable results – a major advance on my attempts with other wordprocessing systems.

At first glance the *LocoScript* system seems to provide most major facilities you would expect from a professional wordprocessor in an extremely accessible manner.

Also bundled with the machine comes the software that accompanies the 6128 – CP/M Plus, DR Logo, GSX, DR's graphics extension package with the addition of Mallard Basic, once again by Locomotive Software.

It should be noted that there is no Basic resident within the machine. Mallard Basic must be soft loaded. The precursor of Locomotive Basic, it offers better filing commands and fewer graphics commands (the 8256 has neither colour nor sound).

CP/M Plus opens up a vast library of software to the potential user – some rather pricy (like *dBase II* weighing in at

LocoScript

a cool £450), others public domain, available from the CP/M User Group. When running under CP/M, the printer automatically defaults to Epson control codes, and the screen emulates a DEC VT52. This makes software installation very easy. Amstrad have set up deals with various companies to ensure that there is a good supply of CP/M software available on their 3 inch format, and have tried to negotiate cheaper versions of 'classic' business packages such as *Supercalc*.

The version of Basic supplied, Mallard Basic, runs under CP/M and is generally business orientated. Its advanced file handling facilities offer sequential, random access and keyed random access, and it is broadly compatible with the most common version of Microsoft Basic. When loaded in there is only 32K available for your own Basic programs.

The documentation supplied with the software runs to two volumes, totalling around 700 pages . . . but do not be daunted. These are some of the best written manuals I have ever read in terms of clarity and logical progression. Recommended reading for future manual authors.

The new keyboard layout

Conclusion

So there you have it. Amstrad have taken the basic principles that took the home computer market by storm and applied them to the business sector.

A no-nonsense, well presented package, which although it is being put forward as a dedicated wordprocessor, is certainly capable of very much more than that.

And the price! We are talking about a monitor / keyboard / printer / software bundle . . . for only a little more than the price of a QL!

Make no mistake, this micro could revolutionise the office and home business computer market. The PCW 8256 is, after all, cheaper than a good electronic typewriter.

And the multinational business micro giants like IBM and Wang stand a chance of being hit where it hurts most – right in the profit margins. At £450 nothing else comes close.

Mallard Basic Keywords

Abs, Addkey, Addrec, All, And, As, Asc, Atn, Auto
Base, Buffers
Call, Cdbl, Chain, Chr$, Cint, Clear, Close, Common, Consolidate, Cont, Cos, Create, Csng, Cvd, Cvi, Cvki, Cvs, Cvuk
Data, Dec$, Def, Defdbl, Defint, Def Seg, Defsng, Defstr, Delete, Delkey, Dim, Dir, Display
Edit, Else, End, Eof, Eqv, Era, Erase, Erl, Err, Error, Exp
Fetchkey$, Fetchrank, Fetchrec, Field, Files, Find$, Fix, Fn, For, Fre
Get, Gosub, Goto
Hex$, Himem
If, Imp, Inkey$, Inp, Input, Input #, Input$, Inpw, Instre, Int
Kill
Left$, Len, Let, Line, List, Llist, Load, Loc, Lock, Lof, Log, Log10, Lower$, Lpos, Lprint, Lset
Max, Memory, merge, Mid$, Min, Mkd$, Mki$, Mkik$, Mks$, Mkuk$, Mod
Name, Next, New, Not
Oct$, On, On Error Goto 0, Open, Option, Or, Oserr, Out, Outw
Peek, Poke, Pos, Print, Print #, Put
Randomize, Rankspec, Read, Rem, Ren, Renum, Reset, Restore, Resume, Resume 0, Return, Right$, Rnd, Round, Rset, Run
Save, Seekkey, Seeknext, Seekprev, Seekrank, Seekrec, Seekset, Sgn, Sin, Space$, Spc, Sqr, Step, Stop, Str$, String$, Strip$, Swap, System
Tab, Tan, Then, To, Troff, Tron, Type
Unt, Upper$, Using, Usr
Val, Varptr, Version
Wait, Waitw, Wend, While, Width, Write, Write #
Xor
Zone

6 HITS TO HIT YOU FOR 6

NOW GAMES

AVAILABLE FOR THE COMMODORE 64 AND SPECTRUM 48K FROM 21 AUGUST FOR ONLY £8.95

Now Games is a chart hit compilation of six top selling games from five major software companies. You'll not find better value or variety of gameplay all inside one box — NOW THAT'S WHAT I CALL SOFTWARE!

1 **LORDS OF MIDNIGHT**
BEYOND
— an atmospheric strategy adventure game with over 2,000 screens

2 **BRIAN BLOODAXE**
IMAGINE
— Brian conquers the Brits in this ingenious 184 screen platform game

3 **STRANGELOOP**
VIRGIN
— Many puzzles to solve in this deserted space factory where your only companions are robots (arcade adventure with 240 screens on the Spectrum and 250 on Commodore 64)

4 **PYJAMARAMA**
MICRO-GEN
— Wally is trapped in a nightmare, you must guide this wacky sleepwalker to find his alarm clock in this arcade adventure

5 **ARABIAN NIGHTS**
INTERCEPTOR
— Platform and arcade action are combined in this exotic game

6 **FALCON PATROL II**
VIRGIN
— All action in the burning desert. Guide a harrier jump jet to defeat devious enemy helicopters in this arcade game

So rush to your nearest good software retailer and increase your games collection by 6 in one fell swoop!

AVAILABLE FROM ALL GOOD SOFTWARE RETAILERS

Also available directly from

VIRGIN GAMES MAIL ORDER, 2-4 VERNON YARD, 119 PORTOBELLO ROAD, LONDON W11 2DX

OR... MADE BY ALIEN

THE FINAL CARTRIDGE®

THE FIRST OUTSIDE OPERATING SYSTEM FOR THE CBM 64

This new operating system built in a cartridge does not use any memory and is always there. Compatible with 98% of all programs.

Features:

- **DISK TURBO** - 6 times faster disk access - loading and saving.
- **TAPE TURBO** - 10 times faster, even with files - normal Commodore commands - compatible with standard turbo's.
- **ADVANCED CENTRONICS INTERFACE** - compatible with all the well-known centronics printers and Commodore printer programs. Prints all the Commodore graphics and control codes (important for listings).

  Advanced screen-dump facilities. Prints Low-Res, Hi-res and Multicolour. Full page!!! Even from games and paint-programs, like Doodle, Koala Pad etc. Searches automatically for the memory-address of the picture.
- **24K EXTRA RAM FOR BASIC-PROGRAMS AVAILABLE:** Two new commands „Memory read", „Memory write". They move 192 bytes with machinelanguage-speed anywhere in the 64K Ram of the CBM 64. Can be used with strings and variables.
- **BASIC 4.0 COMMANDS** - like Dload, Dsave, Dappend, Catalog, etc.
- **BASIC TOOLKIT** - with Auto, Renum (incl. Goto and Gosub), Find, Help, Old, etc.
- **PREPROGRAMMED FUNCTION KEYS:** - Run, Load, Save, Catalog, Disk commands, List (removes all list-protections).
- **KEYBORD EXTRA'S** - Allows you to delete part of a line; stop and continues listings; move cursor to lower-lefthand corner. Pokes and Syscalls in Hex. Typ-command operates your printer as a typewriter.
- **COMFORTABLE EXTENDED ML. MONITOR:** - with relocated load scrolling up and down. Bankswitching, etc.
- **RESET SWITCH:** - resets to monitor; resets with old, resets to Hi-Res printing; resets every protected program.

ON/OFF SWITCH - we hope you never need that one.

12 Months replacement guarantee.

14 Days money back guarantee if you are dissatisfied.

SPECIAL INTRODUCTORY PRICE

FOR ONE **£ 50,-** FOR TWO **£ 37,-** each

FOR THREE OR MORE **£ 30,-** each

Don't wait for your friends **ORDER ONE NOW!!!** Just pay the difference if you reorder within a month.

H&P COMPUTERS

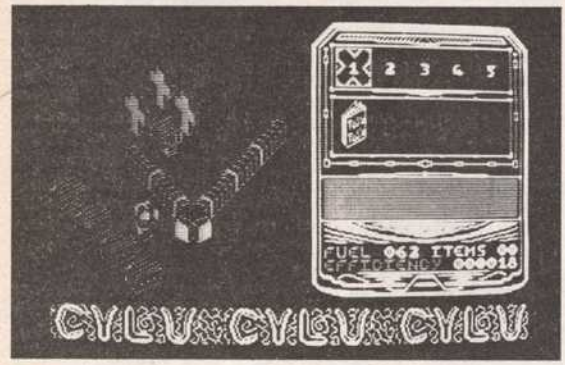
U.K. ORDERS Barclays and Accescards or Cheques should be made out to:
H & P Computers, 9 Hornbeamwalk Witham Essex CM8 2 SZ England.
Telephone: 0376 - 511471.

copyright and registered trademark H&P computers Wolphaertsbocht 236 3083 MV Rotterdam Netherlands Tel 01031 - 10231987 Telex 26401 a mtx nl

Cheap thrill

Program *Cylu* **Micro** Commodore 64 **Price** £2.50 **Supplier** Firebird, Wellington House, Upper St Martin's Lane, London WC2H 9DL

Cylu has to be Firebird's finest budget hour. Beyond the single complaint that graphically it owes rather a lot to Ultimate's *Knight Lore* and *Alien 8*, I can think of nothing else bad to say about it.



Using a similar 3D vantage point to *Alien 8*, it depicts a large maze through which, you, an up-ended silicion chip, must trundly your way.

Within the maze are a host of useful (and useless) objects which you may collect and use at a later date. The task is to find 24 objects and take them to the Master Computer.

Some sections of the maze are only made available via teleports found in the computer section other sections can only be reached once forcefields have been disabled – again it's a matter of finding the right objects and taking them to the computer.

There is one other major difficulty to the game, you must continuously search for fuel – each supply lasts about two minutes so you really don't have time to get things wrong.

The graphics, though Ultimatesque, are also abstract, a strange mixture of basic geometrical shapes, crosses, cubes, etc, and odd objects like books, silicon chips and dice. Between these objects there are a number of pathways; it is mappable but not easy.

The only thing the game rather lacks is sound. What there is seems a little odd. When Cylu walks around you hear the distinctive thud of jackboots rather than the electronic swish you might expect.

Despite having the depressing experience of playing the game nearly 20 times without accomplishing anything other than running out of fuel, I was hooked.

Graham Taylor

Plan ahead

Program *Project Planner* **Micro** QL **Price** £39.95 **Supplier** Sinclair Research, 25 Willis Road, Cambridge CB1 2AQ

Any kind of manager, whether organising flower shows or building houses, will tend to use a technique called Critical Path Analysis – even if they couldn't put a name to it. Whatever you're trying to organise, there are likely to be things that can proceed in parallel, and other events which must be completed before a following vital stage can start. Critical Path Analysis (CPA) is the name for a simple, yet sophisticated, technique for planning the schedule for any project, however complex.

Trouble is, although the basic concepts can be understood and appreciated quite readily, a lot of arithmetic is involved in using CPA effectively. This is where a micro can come in. With a micro many advanced management techniques become accessible to the home user. But to apply these well, a good grasp of the principles and theory is needed.

Accordingly, *QL Project Planner* contains a textbook and interactive teaching programs. As you may expect from Triptych both are very good. The package can safely be recommended to complete beginners, both to computers and CPA. That's user friendly!

You tell the program the activities that comprise the project, tell it what needs to happen before what, and the time each activity will need. From this the program produces a chart which highlights the critical activities (whose delay would delay the whole project), and indicates where dawdling can be tolerated. Most usefully, activities can be modified, deleted or added while you watch the chart. This means you can experiment with 'what if' questions until you are sure your schedule is robuts and can cope with the unexpected.

Other reports show the timetabling of the events, both in true date terms and in terms of the time elapsed since the start of the project. The true or calendar dates are especially useful for lengthy projects where weekends, bank holidays, and other breaks must be taken into account. The early and late start and finish dates are shown for each part of the project together. The program will print all reports to an Epson FX or RX printer.

The facility for milestoning is essential for serious use. Milestones can be used to indicate activities which cannot start until some external event has happened. They can also be used to split up your project should you need to specify more than 60 different activities.

Versions of *Decision Maker* have been produced for the BBC, Commodore 64 and Amstrad CPC's. The QL version uses an 80 column display, programmes holidays and gives actual calendar dates.

This impressive program with an established record makes 'real', 'business' CPA available to a potentially huge market on a relatively cheap micro.

John Tucker

List aid

Program *Silas* **Micro** BBC B **Price** £12.95 **Supplier** Astral Software, 152 Melton Road, Stanton-on-the-Wolds, Nottingham

Lprogram listings – either on screen or as a print-out – can be hard to decipher.

The BBC micro has inbuilt aids to arranging program lists more legibly but they cannot cope well with multi-statement lines. *Silas* – Super Intelligent List Augmenting System – can.

On screen it breaks up lines into sections, colours keywords and star (*) commands, indents *For-next* loops and inserts spaces where appropriate to help readability. When used with an Epson-style printer it prints out these features with different type-styles to create the same effect and suppresses teletext codes which upset printers.

Silas limits its indents on-screen to sensible levels but on paper you can expect it to stretch right over 80 columns.

Silas is a machine-code program that loads "transparently" from tape or disc into rarely-used sections of *Ram*.

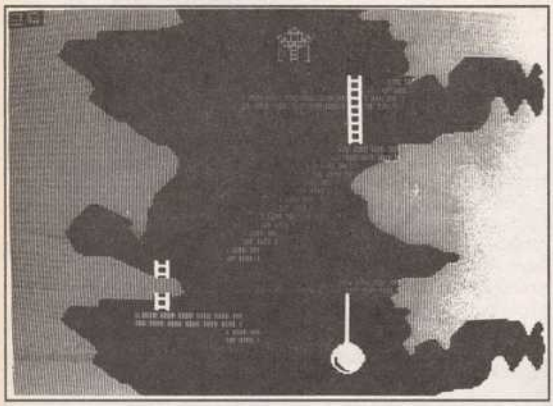
Press a function key and *List* your program to see it in *Silas*-scope. Then *List* for an ordinary peep.

Silas keeps out of the way until you want it.

A sensible and mercifully brief handbook explains the minor limitations of the utility.

This is one of those practical aids that really does make life easier and is warmly recommended.

Jan Watterson



Deft descent

Program *Devil's Descent* **Micro** Spectrum 48K **Price** £0.95 **Supplier** Central Solutions, 500 Chesham House, 150 Regent Street, London W1R 5FA

You have to hand it to Pocket Money Software, its name is one hundred per cent accurate.

This amount, just a bit under a pound, was pocket money even when I was a lad (and in those days. . .). But what about the game? After all, a pound spent is a pound wasted if the product is unplayable.

Well, *Devil's Descent* is far from that. Admittedly it's rather basic, but you didn't really expect *Frankie* did you? If instead you expected an arcade game, a sort of *Lunar Lander*, in fact you won't be disappointed. You have a fleet of eight craft to guide left and right as they descent through forty screens of caverns, avoiding ledges, plant-life, lasers and suspended skeletons.

There are three speeds of sideways drift and you have to be pretty nifty in changing direction. A knowledge of the screen to come helps too as you want to be in position when you enter it.

It's extremely simple to describe but tricky to play and it proved surprisingly addictive. There's always the hope that next time - just next time, you'll do it.

Even if you only play it a handful of times it will have cost less than a dozen goes on an arcade machine. Astounding value.

John Minson

Spelt out

Program *Braxx Bluff* **Micro** CPC 464 **Price** £8.95 **Supplier** Amsoft, 169 Brentwood House, 169 Kings Road, Brentwood, Essex CM14 4EF

"Centuries from now, man has begun to explore unimaginably distant worlds in search of resorses and knowledge" it says on the inlay. Presumably when man finds the knowledge he will learn how to spell resources. This game is converted from Micromega's Spectrum original and since their star programmer Derek Brewster has a thriving second career as a journalist we must assume that it is the Amsoft copyrighters who are responsible for such illiterate drivel as "creatures in there (sic) many forms have feed (sic) on the rovers (sic) energy banks". Perhaps the creatures in there many forms have feed on the writer's higher brain centres as well.

Micromega's 3D range which included such gems as *Deathchase*.

The scenario is reasonable enough – you are a sort of space ambulanceman who must find and rescue the people being 'feeded on' by the creatures (in their many forms). You must land a spaceship, walk on wasteland, drive the rover over a marsh, a ruined city and an acid sea to get back to the base ship, all before the crewmen die. It is a race against time made more difficult by the need for coordination and the aforementioned creatures. Unfortunately playing it boils down to just steering things up and down, left and right and switching to the gun which fires up, down, left and right, etc.

Perhaps I'm being a bit harsh – Micromega never released anything really dreadful – but the whole thing somehow just lacks any spark, and the 3D looks dated and tired against the standards set by the likes of *Knightlore* and *Gyron* today.

Once you have thrown away the box it is somewhat of a disappointment to find that perhaps the game should have gone with it. *Braxx Bluff* was the last in the series of

Not really worth £9 unless you are desperate for a break from platform games.

Tony Kendle

Word power

Program *Dictionary Use* **Micro** Commodore 64 **Price** £7.95 **Supplier** McGraw Hill, Shoppenhangers Road, Maidenhead, Berks SL6 2QL

Dictionary Use is an educational package in the "Ladders to Learning" series. An unusual subject for a computer program, but I think it's handled rather well.

Turning back the clock and trying to imagine myself as an eight-10 years old, I fished out my dictionary and loaded the program. Gee! Wow! It even has a loading screen.

The first couple of screens explain what dictionaries are and what they're used for. Then it is down to the real stuff – how to find a word.

After sections on phonetic spelling, how dictionaries are set out, using dictionaries to find out how a word is spelt, etc, etc, there is a final test to see if you've learnt anything in the last hour.

Anything a youngster could want to know about dictionaries is here, along with useful advice "if this doesn't work, go and ask Mum and Dad".

The thing I liked about *Dictionary Use* is the way that it made the user actually participate in what's going on – you don't just sit watching the computer, learning nothing. This is achieved by the use of small tests after each section, which encourages the child to use his/her dictionary. It is also pretty user-friendly – no reprimands if you get a question wrong. There's not much point in using the program twice, though. Still, it's well-thought-out and presented.

Tom Hussey

NEW

TAPE - Commodore 64 - DISK

SUPER-BREAKER

ALL THIS IS ONE GREAT DISK

1. TURBO BREAKER II: Now transfers many more turbo's to disk than before e.g., Novaloads, Pavloaders, Pavloaders with pictures, Flashload, Hyperload, CBS, Ariola, Burner, Micro Power, Adventure Inter, and lots more.

2. TRANSFER II: To transfer those slow load games to disk.

3. SUPER DISKOPY: Now copy from Disk to Disk in only 3 MINS on one disk drive, copies protected commercial disk with error tracks.

4. TURBO MENU MAKER: This is a selective menu maker that also saves a disk turbo with the file, so now you only include the file names you wish and then turbo load them from the disk.

YOU GET ALL THIS ON ONE SUPER DISK FOR ONLY £22.00 INCLUDING P & P

SUPPLIED SEPERATELY:

TURBO BREAKER II ONLY £12.95 TURBO MENU MAKER ONLY £10.95
SUPER DISKOPY ONLY £10.95 TRANSFER II ONLY £ 8.00

ARROW FILE: Now you can store all your software records in order. List them all or by letter, print them out in double column. This program can be used to make lists of books etc., Only £10.95 Disk.

DISK DOCTOR: A full disk editor, recover a scratched file, edit any block, amend any track, list any track. Only £8.00 Tape.

TURBO SAVER: Make easy back up copies at turbo speed from your slow load programs, multi parts etc., easy to use. £8.00 Tape.

DISKOPY: A selective disk copier to transfer only the files you wish from disk to disk, very easy to use. £7.00 Tape.

ARROW MICRO SERVICES

20 Portmeadow Walk : London S.E.2

1541 FLASH!

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

SUPERSOFT

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

PD404

SUMMER SALE!

PRINTER OFFERS

SHINWA/MICRO P CPA80

Bulk purchase allows us to offer this **highly popular, high specification** printer at an **unheard of price.** This printer, now reported to be the most popular in it's class, boasts many superb features. It uses square pins which avoids that "dotty" look and gives a nicely formed up **"near letter quality"** print at 100cps. Friction and tractor feed are standard fittings and the dip switches are externally accessible. Take a look at these unretouched, actual size print samples.

Standard PICA text (100cps)
PICA text emphasised
True descenders on jpg etc.
ELITE mode gives 96 columns
CONDENSED mode gives 142 columns
ENLARGED mode
SUBSCRIPTS and SUPERSCRIPTS
underlines nicely
Italics available in all modes

We are convinced that this printer offers the **best performance and value** in it's class and at our unheard of price is a **BARGAIN.**

ONLY £189.95

Price **includes** cable to suit BBC, Amstrad, Einstein, CBM 64, Dragon, Memotech or Oric.
For Spectrum owners c/w Kempston Centronics "E" £209.95

ALPHACOM 32

Special Purchase allows us to offer these popular printers at a substantial saving on normal price

ONLY £49.95

STAR SG10C

A superb new 120 cps **Commodore ready** printer that offers many features including friction and tractor feed, CBM graphics, near letter quality mode etc. Packaged ready to use at the special introductory price of

ONLY £255.00

COMMODORE MPS801

Unbelievable price on this poular printer suitable for the '64 & Vic 20

ONLY £99.95 (this is not a misprint)

COMPUTER OFFERS

SPECTRUM+ 48K

For a limited period we are offering the latest model Sinclair Spectrum+ c/w six pack of software for the unheard of price of **£99.95**

SPECTRUM EXPANSION SYSTEM
Save £20 on normal price only £79.95
SINCLAIR QL latest s'ware only £299.95
JOYSTICK SPECIAL DEAL
Protek 3 position switchable joystick interface c/w Quickshot II joystick only £19.95
Quantities are strictly limited so act quickly

PD340

All prices include P&P and VAT. Send cheque, Postal Order or Credit Card No. Credit Card order accepted by phone. Callers welcome. Wide range of goods stocked. Trade enquiries welcome. European orders send price as advertised. Outside Europe £2.00 for airmail. Mail order to Evesham Shop please.

EVESHAM MICROS
BRIDGE STREET, EVESHAM, WORCS., WR11 4RY.
Tel: 0386 49641

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

commodore HORIZONS

Subscribe to **Commodore Horizons** for one year and receive your choice of Sunshine Book listed below, free of charge. Write with your name, address and choice of book enclosing your subscription fee of £10.00 (£16.00 overseas), to:

CH subs. 12-13 Little Newport Street, London WC2H 7PP

- **Beginning Machine Code on the C64**
- **Commodore Disc Companion**
- **The Working Commodore C16**

PD365

Micro Mania

Save the program in this game for Spectrum 48K by Simon Johnson

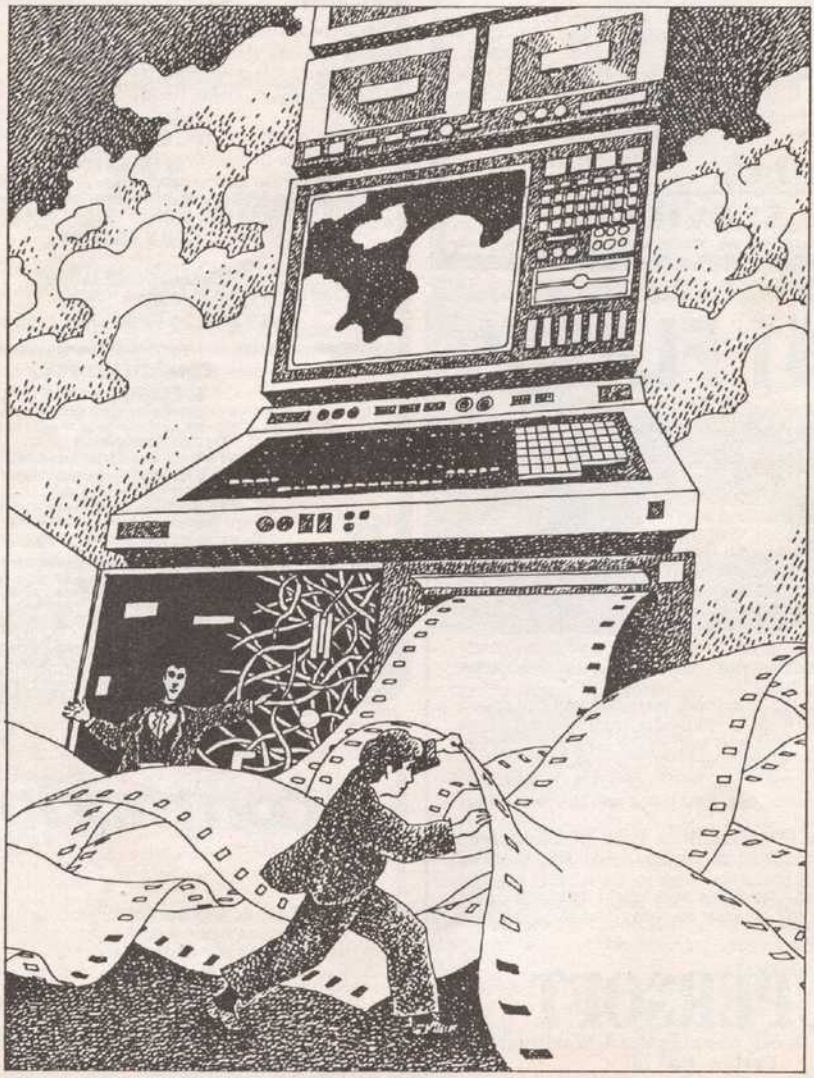
Thousands of bugs have been let loose within a program. It is up to you to save it from crashing by collecting all 12 of the registers used by the programmer before the bugs catch you.

Full instructions are given within the program. Good luck!

Program Notes

Line No	
4-43	Title screen
46-97	Initialisation of variables and presentation of screen
100-300	Mainframe loop
400-420	Clear playing section of screen
700-745	Death routine & game over routine
750-1660	Instructions
8000-9060	Define graphics and initialise machine code sound.

Note: the underlined capital letters in the listing should be entered in graphic mode.



```
  4 GO SUB 9000: LET h$="SIMON
JOHNSON": LET hc=5000
  5 BORDER 0: PAPER 0: INK 5: C
LS
  6 PLOT 0,172: DRAW  INK 2;255
,0
  7 REM intro screen
 10 PRINT AT 0,7; BRIGHT 1;" DE
ADLY ERRORS "
 20 LET sc=0: LET le=1: LET to=
0
 30 PRINT '''"CONTROLS..."''"Q
... UP        A ... DOWN"'"N ...
LEFT      M ... RIGHT"
 32 PRINT '' INK 6;"HIGH SCORE
:"''h$;"  ";hc
 34 PRINT  INK 4;''''"PRESS '1'
FOR INSTRUCTIONS"''"PRESS '2' TO
 START GAME"
 36 LET u=1: LET i=1:: LET y1=2
0: LET y2=1: LET x1=1: LET x2=5:
 LET iu=-1: LET ui=1: PRINT AT y
1,x1; INK 5;"A";AT y2,x2; INK 6;
"B"
 37 PRINT AT y1,x1; OVER 1;"A":
 LET y1=y1+iu: LET x1=x1+ui: IF
 y1>20 OR y1<2 THEN  LET iu=iu*-1
 38 IF x1>30 OR x1<1 THEN  LET
ui=ui*-1
 39 PRINT AT y1,x1; OVER 1; INK
 5;"A"
 40 PRINT AT y2,x2; OVER 1;"B":
 LET y2=y2+u: LET x2=x2+i: IF y2
>20 OR y2<2 THEN  LET u=u*-1
 41 IF x2>30 OR x2<1 THEN  LET
i=i*-1
 42 PRINT AT y2,x2; INK 6; OVER
 1;"B"
 43 GO TO 37+12*(INKEY$="2")+14
63*(INKEY$="1")
 46 REM  initialize variables
 49 CLS
 50 INK 4: LET a=10: LET b=15:
LET c=10: LET d=0
 90 INK 6: PLOT 0,39: DRAW 255,
0: PLOT 0,136: DRAW 255,0: PLOT
0,20: DRAW 255,0
 92 PLOT 0,155: DRAW 255,0: PLO
T 70,40: DRAW -70,-30: PLOT 110,
40: DRAW -40,-40: PLOT 150,40: D
RAW 40,-40: PLOT 190,40: DRAW 65
,-30
 94 PLOT 70,135: DRAW -70,30: P
LOT 110,135: DRAW -40,40: PLOT 1
50,135: DRAW 40,40: PLOT 190,135
: DRAW 65,30
 95 GO SUB 600: GO SUB 400: PRI
NT AT 0,11; INK 2;"SCORE ";sc
 96 FOR t=1 TO (24-le): PRINT A
T 5+RND*11,RND*31; INK 3; BRIGHT
 1;"C": NEXT t
 97 FOR t=1 TO 20: PRINT AT 5+R
ND*11,RND*31; INK 2; BRIGHT 1;"D
": NEXT t
 99 REM mainframe
100 PRINT AT a,b;" "
110 LET a=a+(INKEY$="a" AND a<1
6)-(INKEY$="q" AND a>5): LET b=b
+(INKEY$="m" AND b<31)-(INKEY$="
n" AND b>0)
112 IF ATTR (a,b)=66 THEN  LET
sc=sc+100+(le*10): LET to=to+1:
GO SUB 350: POKE 23307,80: LET 1
=USR 23300
114 IF ATTR (a,b)=67 THEN  GO T
O 700
120 PRINT AT a,b; INK 5;"A"
140 PRINT AT c,d;" "
150 IF c<a THEN  IF ATTR (c+1,d
)<>66 THEN  LET c=c+1
160 IF c>a THEN  IF ATTR (c-1,d
)<>66 THEN  LET c=c-1
170 IF d>b THEN  IF ATTR (c,d-1
)<>66 THEN  LET d=d-1
180 IF d<b THEN  IF ATTR (c,d+1
)<>66 THEN  LET d=d+1
190 IF c=a AND d=b THEN  GO TO
700
195 IF ATTR (c,d)=67 THEN  LET
c=5+INT (RND*10): LET d=0: POKE
23307,10: LET l=USR 23300
200 PRINT AT c,d; INK 6;"B"
300 GO TO 100
340 REM print score
350 PRINT AT 0,17; INK 4;sc
351 IF to=12 THEN  FOR q=1 TO 1
8: PRINT AT 8,7; INK 4+RND*3;"LE
VEL ";le;" COMPLETE": POKE 23307
,90: LET l=USR 23300: POKE 23307
,120: LET l=USR 23300: NEXT q: L
ET to=0: LET le=le+1: GO TO 50
360 RETURN
370 REM clear screen
400 LET k$="
                "
410 FOR y=5 TO 16: PRINT AT y,0
; PAPER RND*7+1;k$: NEXT y
420 FOR y=5 TO 16: PRINT AT y,0
; PAPER 0;k$: PAUSE 1: NEXT y: R
ETURN
599 REM Prepare for next level
600 PRINT AT 10,5; INK 4; BRIGH
T 1;"PREPARE FOR LEVEL ";le: BEE
P .1,20: FOR y=1 TO 50: NEXT y:
BEEP .1,20: FOR y=1 TO 50: NEXT
y: BEEP .1,20: FOR y=1 TO 50: NE
XT y: RETURN
700 REM Death Routine
710 FOR x=1 TO 30
720 PRINT AT a,b;"A": PRINT AT
a,b; OVER 1; INK RND*4+3;CHR$ (7
0+RND*20)
730 POKE 23307,x: LET l=USR 233
00: POKE 23307,x+5: LET l=USR 23
300: NEXT x
740 IF sc>hc THEN  LET hc=sc: G
O TO 750
745 GO TO 5
750 CLS : PRINT ' INK 7;"CONGRA
TULATIONS"''' INK 6;"YOU HAVE AC
HIEVED"''' INK 5;"THE HIGHEST SC
ORE"''' INK 4;"PLEASE ENTER YOUR
 NAME"''' INK 3;"BETWEEN 1 TO 20
 LETTERS"
760 INPUT h$: IF LEN h$>20 THEN
 LET h$=h$( TO 20)
770 GO TO 5
1400 REM instructions
1500 CLS : INK 5: PRINT AT 0,7;"
INSTRUCTIONS": PRINT '"DEEP INSI
DE THE CIRCUITS OF A  COMPUTER
A DATA PULSE GLEEFULLY GLIDES AC
ROSS THE CONTROL LINES ON ITS WA
Y TO AN ADDRESS  DESTINATI
ON."
1510 PRINT "BUT WAIT!.OH NO - A
BUG - . DUE TO A PROGRAMMING ERR
OR THOUSANDSOF BUGS HAVE BEEN LE
T LOOSE AND ARE NOW ON THE RAMPA
GE."
1520 PRINT "YOUR ONLY HOPE OF SU
RVIVOL IS TOCOLLECT ALL THE REGI
STERS THAT  THE PROGRAMMER HAS U
SED (12 IN  ALL) BEFORE THE BUGS
 DESTROY YOU"
1530 PRINT "THE BUGS ARE FAST BU
T WILL ACT  LIKE HOMING MISSILES
 AND FOLLOW YOUR EVERY MOVE SO Y
OU MUST TRY AND GUIDE THEM INTO
A DEADLY  INTERUPT FLAG BEFORE
 THEY REACH YOU."
1540 PRINT AT 21,7;"PRESS ANY KE
Y"
1550 IF INKEY$="" THEN  GO TO 15
50
1560 CLS : PRINT AT 0,6;"INSTRUC
TIONS"
1570 PRINT '"IF YOU GUIDE A BUG
INTO AN  INTERUPT FLAG IT WI
LL BE  DESTROYED."
1580 PRINT "YOU WILL ALSO DIE IF
 YOU TOUCH AFLAG"
1590 PRINT "EACH LEVEL WILL GET
SLIGHTLY  HARDER THAN THE LAST
."
1600 PRINT '"CHARACTERS..."'' IN
K 5;"A ... DATA PULSE"
1610 PRINT ' INK 6;"B"; INK 5;"
... BUG"
1620 PRINT ' INK 2;"D"; INK 5;"
... REGISTER"
1630 PRINT ' INK 3;"C"; INK 5;"
... INTERUPT FLAG"
1640 PRINT AT 21,6;"PRESS ANY KE
Y"
1650 IF INKEY$="" THEN  GO TO 16
50
1660 GO TO 5
8000 REM graphics and m/c sound
9000 FOR a=USR "A" TO USR "D"+7:
 READ s: POKE a,s: NEXT a
9010 DATA 60,90,165,219,219,165,
90,60
9020 DATA 126,153,153,90,60,60,6
6,165
9030 DATA 1,2,3,4,5,6,7,8
9040 DATA 0,0,58,84,171,84,58,19
9
9050 FOR s=0 TO 19: READ z: POKE
 23300+s,z: NEXT s: RETURN
9060 DATA 33,10,0,17,2,0,6,90,35
,229,197,205,181,3,193,225,35,16
,246,201
```

Manic mutants

The final helping of Pandemonia code written for the BBC by ***Jeffrey Cooke***

A nuclear power plant has just exploded and in the ensuing "pandemonia" you attempt, in your already mutated form, to reach the reactor by ascending its waste pipe. You must attempt to stop dangerous particles reaching the sea as you progress through increasingly radioactive levels.

Mutated piranha fish attempt to eat you and various pieces of machinery as well as anti-matter block your path. As an air breathing creature, you must complete each level before your oxygen is exhausted, safe nuclear particles add to your score. Only *you* can save the sea from contamination.

To avoid 'spots before the eyes' syndrome, Jeffrey Cooke is making available copies of the game on tape. Write to him, enclosing £2.50, at 152 Galliagh Park, Derry, N. Ireland BT48 8DF.

```
2660DATA 0CA57CBD0E0C60A57CF0
2670DATA 1320C022A57CF00C2002
2680DATA 22208C2220E8224C8B22
2690DATA 20302360A57A8570A57B
2700DATA 8571A9078575A9048576
2710DATA A9928577A92F857B205D
2720DATA 2560A57A8570A57B8571
2730DATA A907B575A90485762041
2740DATA 27A900857C60A57A8570
2750DATA A57B8571A9048572A907
2760DATA 8573202827A94420C526
2770DATA F00320AB226020002920
2780DATA 062320A82260A57A8570
2790DATA A57B8571A9048572A907
2800DATA 8573202827A90420C526
2810DATA F00320DE2260A9128570
2820DATA A9008571A9038572A900
2830DATA 8573A9C88574A9008575
2840DATA A9018576A9008577A270
2850DATA A000A90720F1FF60A9FF
2860DATA 20A128C9A0D00320AE28
2870DATA 60A90B858BA900858AA9
2880DATA 008589A48AA6B9B9360C
2890DATA 957AE8C8E006D0F52075
2900DATA 23A9008589A48AA6B9B5
2910DATA 7A99360CE8C8E006D0F5
2920DATA 84BAC68BD0D160A57CF0
2930DATA 1DA901857CA57F495585
2940DATA 7F20CB23A57CF00C2002
2950DATA 2220172520E9234C9C23
2960DATA A57FF0DFC67F6020EA28
2970DATA 20332520A72360A57A85
2980DATA 70A57BB571A9088575A9
2990DATA 0485762041278A7D857A
3000DATA A57E857BA900857CA9FF
3010DATA 857F60A57A8570A57B85
3020DATA 71A9048572A908857320
3030DATA 2B27A94420C526F00320
3040DATA A72360A57A8570A57B85
3050DATA 71A9048572A908857320
3060DATA 2B27A90420C526F00320
3070DATA 9D2360A908B588A90085
3080DATA 8AA9008589A48AA689B9
3090DATA 900C957AE8C8E006D0F5
3100DATA 203F24A9008589A48AA8
3110DATA 89B57A99900CE8C8E006
3120DATA D0F5848AC68BD0D160A5
3130DATA 7CF01DA901857CA57F49
3140DATA DD857F209524A57CF00C
3150DATA 20022220D12420B3244C
3160DATA 6624A57FF0DFC67F6020
3170DATA F52820ED242071246045
3180DATA 7A8570A57BB571A90585
3190DATA 75A9038576204127A57D
3200DATA 857AA57E857BA900857C
3210DATA A9FFB57F60A57A8570A5
3220DATA 7B8571A9038572A90585
3230DATA 73202827A94420C526F0
3240DATA 0320712460A57A8570A5
3250DATA 7B8571A9038572A90585
3260DATA 73202827A90420C526F0
3270DATA 032067246045 7A8570A5
3280DATA 7B8571A9038575A90385
3290DATA 76A9568577A92F857B20
3300DATA 5D2560A9138570A90085
3310DATA 71A9148572A9008573A9
3320DATA 328574A9008575A90185
3330DATA 76A9008577A270A000A9
3340DATA 0720F1FF60A57A8570A5
3350DATA 7B8571A9088575A90485
3360DATA 76A9368577A92F857B20
3370DATA 5D2560A9138570A90085
3380DATA 71A9048572A9008573A9
3390DATA 968574A9008575A90185
3400DATA 76A9008577A270A000A9
3410DATA 0720F1FF60E675A57585
3420DATA 79A9008574A570B572A5
3430DATA 718573A5798575A474B1
3440DATA 77A0009172A572290FC9
3450DATA 0FF014C907F010A57218
3460DATA 69018572A57369008573
3470DATA 4CA425A5721869798572
3480DATA A5736928573C675F005
3490DATA E6744C7325A5701869 08
3500DATA B570A57169008571C676
3510DATA D0A960A570290FC900F0
3520DATA 14C908F010A5703BE901
3530DATA B570A571E90085714CE8
3540DATA 25A57038E9798570A571
3550DATA E902857160A570290FC9
3560DATA 07F014C90FF010A57018
3570DATA 69018570A57169008571
3580DATA 4C1226A5701869798570
3590DATA A5716902857160A572C9
3600DATA 00F007A90085724C3126
3610DATA A5703BE9088570A571E9
3620DATA 008571A9018572A90085
3630DATA 7360A572C901F007A901
3640DATA 85724C5426A570186908
3650DATA 8570A5716900857 1A900
3660DATA 8572A901857360A57038
3670DATA E9088570A571E9008571
3680DATA 60A5701869088570A571
3690DATA 69008571608570A90FA2
3700DATA 0120F4FFA0FFA670A9B1
3710DATA 20F4FF986020BF252059
3720DATA 266020BF25A672206726
3730DATA CAE000D0FB60E6722059
3740DATA 26A67220E925CAE000D0
3750DATA FB60E673A672206726CA
3760DATA E000D0F8A67320E925CA
3770DATA E000D0FB608572A00081
3780DATA 7029558573B17029AA6A
3790DATA 8574A572C573F009C574
3800DATA F005A9004CE726A9FF60
3810DATA 20BF25A5721B6A18AA20
3820DATA 6726CAE000D0F8602059
3830DATA 26205926A5721B6A18AA
3840DATA 20E925CAE000D0FB60A5
3850DATA 72186A18AA206726CAE0
3860DATA 00D0F8A67320E925CAE0
3870DATA 00D0FB60A5731B6A18AA
3880DATA 20E925CAE000D0F8A672
3890DATA 206726CAE000D0FB60E6
3900DATA 75A5758579A9008574A5
3910DATA 798575A5708572A57185
3920DATA 73A900A0009172A57229
3930DATA 0FC90FF014C907F010A5
3940DATA 72186901857 2A5736900
3950DATA 85734CB627A572186979
3960DATA 8572A57369028573C675
3970DATA F005E6744C5727A57018
3980DATA 69088570A57169008571
3990DATA C676D0AB60A98020B927
4000DATA A90FA20120F4FF20E0FF
4010DATA 20E429A9FF20B92760AA
4020DATA A0FF88C000D0FBCAE000
4030DATA D0F460203619A200BD00
4040DATA 0A20EEFFEBE0CDD0F520
4050DATA 4529208B2920212A6020
4060DATA B329E688A5858DF70CA5
4070DATA B7C90AB0034CF927A902
4080DATA 8DF70C60A91320EEFFA9
4090DATA 0220EEFFA90720EEFFA9
4100DATA 0020EEFFA90020EEFFA9
4110DATA 0020EEFF60A91320EEFF
4120DATA A90220EEFFA90120EEFF
4130DATA A90020EEFFA90020EEFF
4140DATA A90020EEFF60A91320EE
4150DATA FFA90220EEFFA90220EE
4160DATA FFA90020EEFFA90020EE
4170DATA FFA90020EEFF60200929
4180DATA A20020FA2720542A2019
4190DATA 2820542ACAE000D0EF20
4200DATA 3828A9008585C68460A0
4210DATA 0818ADFF0C100FA202BD
4220DATA FC0C5DF80C9DFC0CCA10
4230DATA F4382EFC0C2EFD0C2EFE
4240DATA 0C2EFF0C88D0DCADFF0C
4250DATA 60857020728C5709003
4260DATA 4CA32860A91520A12818
4270DATA 0AAABDAE2F857AE8BDAE
4280DATA 2F857BA901857C200222
4290DATA A90B20A128B572A57A18
4300DATA 6572857AA57B6900857B
4310DATA A57A186908857AA57B69
4320DATA 00857B60E687A9102033
4330DATA 292045296 0E687A92020
4340DATA 33292045296 0A9502033
4350DATA 2920452960A9108570A9
4360DATA 008571A9018572A90085
4370DATA 73A9328574A9008575A9
4380DATA 018576A9008577A270A0
4390DATA 00A90720F1FF608570FB
4400DATA A5BE186570858EA58F69
4410DATA 00858FDB60A91F20EEFF
4420DATA A90F20EEFFA91D20EEFF
4430DATA A5BF29F04A4A4A4A1869
4440DATA 3020EEFFA58F290F1869
4450DATA 3020EEFFA58E29F04A4A
4460DATA 4A4A18693020EEFFA58E
4470DATA 290F18693020EEFF60A5
4480DATA BD20332960A91F20EEFF
4490DATA A90F20EEFFA91E20EEFF
4500DATA A58D29F04A4A4A4A1869
4510DATA 3020EEFFA58D290F1869
4520DATA 3020EEFF60A58C186901
4530DATA 858CC940D025A900858C
4540DATA A58DF016F838E9018589
4550DATA D8A58DC904B003205C2A
4560DATA 208B294CE329A9018585
4570DATA 208B2960A9008578A903
4580DATA B570A9F18572A9FF8573
4590DATA A900857185785 77A578
4600DATA 182AAABDF00B8574E8BD
4610DATA F00B8576A270A000A907
4620DATA 20F1FFA5781869018578
4630DATA C907D0DC60A91720EEFF
4640DATA A90020EEFFA90A20EEFF
4650DATA A92020EEFFA90020EEFF
4660DATA A90020EEFFA90020EEFF
4670DATA A90020EEFFA90020EEFF
4680DATA A90020EEFF60A04088C0
4690DATA 00D0FB60A9028570A900
4700DATA 8571A9F18572A9FF8573
4710DATA A9FF8574A9008575A901
4720DATA 8576A9008577A270A000
4730DATA A90720F1FF60A588186A
4740DATA B003202A1E602C052DD0
4750DATA 9220229268ABA52A9102
4760DATA C8A52B9102C8984B2031
4770DATA 9220978AC92CF0D5C929
```

```
4780DATA F0034C27916885156885
4790DATA 3FA9008540203692A000
4800DATA A5159102652A852A9002
4810DATA E628A5038538A5028537
4820DATA 1B652AA8A52B6503B034
4830DATA AAC404E505B02D840286
4840DATA 03A5376515A8A9008537
4850DATA 9002E6389137C8D00000
4860
4870
5000DATA 0000000000000000000
5010DATA 000000000000000040C
5020DATA 0C0C0400040404040400
5030DATA 000000000C0C0C0C0C0C
5040DATA 0C0C0C0C0C0C0C040404
5050DATA 00000C3F2B0C0C080C0C
5060DATA 0C0C0C0C08080C000000
5070DATA 00000C0C00000B080808
5080DATA 00000B0000000000000
5090DATA 0000000000000000000
5100DATA 0000000000000000000
5110DATA 0000000000000000000
5120DATA 0004040400000000000
5130DATA 000000000000000C0C0C
5140DATA 0C0C040C0C0C0C0C0400
5150DATA 040400000C1D1D0C0C0C
5160DATA 0C0C0C0C0C0C0C0C0800
5170DATA 00082A020C0C000B0C0C
5180DATA 0C0C0B000B0C00000000
5190DATA 000808000000000000
5200DATA 000B0000000000000000
5210DATA 0000000000000000000
5220DATA 0000000000000000000
5230DATA 0000000000000000000
5240DATA 00000C0C000004040404
5250DATA 000004000000C3F170C
5260DATA 0C040C0C0C0C0C0C0404
5270DATA 0C00000C0C0C0C0C0C0C
5280DATA 0C0C0C0C0C0808080000
5290DATA 080C0C0C0800080B0808
5300DATA 0800000000000000000
5310DATA 0000000000000000000
5320DATA 0000000000000000000
5330DATA 0000000000000000000
5340DATA 0000000004040000000
5350DATA 0000000040000000415
5360DATA 010C0C00040C0C0C0C04
5370DATA 00040C00000C2E2E0C0C
5380DATA 0C0C0C0C0C0C0C0C0C04
5390DATA 00000C0C0C0C0C080C0C
5400DATA 0C0C0C080008080000000
5410DATA 0808080000000000000
5420DATA 0000000000000000000
5430DATA 0000000000000000000
5440DATA 0000000000000000000
5450DATA 0000000014ED3C143C14
5460DATA 0000000038C3C3C3C3C
5470DATA 0000030303C3C3C3030
5480DATA 1000020303C3C3C3C20
5490DATA 0000000203C3C3C2800
5500DATA 0000000003C3C3C0000
5510DATA 0000001438303030314
5520DATA 0000000000000000000
5530DATA 0000000000000000000
5540DATA 000002B343030303428
5550DATA 0000000003C3C3C0000
5560DATA 0000000103C3C3C1400
5570DATA 0000010303C3C3C3C10
5580DATA 0000030303C3C3C3030
5590DATA 2000000343C3C3C3C3C
5600DATA 00000000283E3C283C28
5610DATA 0000000000000000000
5620DATA 0000000000000000000
5630DATA 0000000001414001400
5640DATA 000000003C3E3C3C3C3C
5650DATA 0000010303C3C3C3838
5660DATA 0000030303C3C3C3430
5670DATA 2000000303C3C3C3C00
5680DATA 0000000003C3C3C0000
5690DATA 0000000014383838140
5700DATA 0000002B202020202028
5710DATA 0000000000000000000
5720DATA 0000000000000000000
5730DATA 0000001410101010014
5740DATA 0000000028343434280
5750DATA 0000000003C3C3C0000
5760DATA 0000000303C3C3C3C00
5770DATA 0000030303C3C3C3830
5780DATA 1000020303C3C3C3434
5790DATA 000000003C3B3C3C3C3C
5800DATA 0000000002828002800
5810DATA 0000000000000000000
5820DATA 0000000000000000000
5830DATA 0000010203010000003
5840DATA 0301030303000000203
5850DATA 0302000000000000000
5860DATA 1122110002233220000
5870DATA 0000000000000000040
5880DATA 0000550000400000080
5890DATA 40FF40800000000AAAAEA
5900DATA FFEAAAAA000040B000FF
5910DATA 0080400000000000000
5920DATA 0000000005000000001
5930DATA 0307030100000020702
5940DATA 0000003A803C003FB041
5950DATA 0044B046004980480O4E
5960DATA B050005380550058805A
5970DATA 005D805F0062B0640067
5980DATA 8069006C806E00710000
5990DATA 0000000000000000000
6000DATA 0000000000000000000
6010DATA 0000000000000000000
6020DATA 00000000F00000000000
6030
6040DATA 160212000913090500000
6050DATA 00190400009E001905FF
6060DATA 049E00190400000B00319
6070DATA 05FF0480031904000096
6080DATA 001905FF049600190400
6090DATA 0088031905FF04B80319
6100DATA 04C80096001905C80088
6110DATA 0019055E018B0019055E
6120DATA 0196001904C800B80319
6130DATA 05C80096031905SE0196
6140DATA 0319055E018B0319049D
6150DATA 0396001905980B80019
6160DATA 0533048B001905330496
6170DATA 0019049D03B80319059B
6180DATA 0396031905330496O319
6190DATA 05330488031F04001102
6200DATA 2050414E44454D4F4E49
6210DATA 412012000A130A000000
6220DATA 00190400009E00190500
6230DATA 00B0031904FF049E0019
6240DATA 05FF0480030000000000
6250DATA 0000000000000000000
6260DATA 0000000000000000000
6270DATA 0000000000000000000
6280DATA 0000000000000000000
6290DATA 0000000000000410000
6300DATA 0000406C000100000B5D
6310DATA 0000000030540100000O
6320DATA F0630100000000420100
6330DATA 0000D06B00000000A046
6340DATA 0000000088550000000O
6350DATA 88C00883C5C88410088
6360DATA 41E6884600B846178B4B
6370DATA 00884B8A885000885085
6380DATA 8855008855458850A00B8
6390DATA 5ACF885F00885FFD9864
6400DATA 008864A188690088692E
6410DATA 886E00886E7300000000
6420DATA 0000000000000000000
6430DATA 0000000000000000000
6440DATA 883C008B3C5C88410088
6450DATA 41E6884600B846178B4B
6460DATA 00884B8A885000885085
6470DATA 8855008855458850A0088
6480DATA 5ACF885F00885FFD8864
6490DATA 008864A188690088692E
6500DATA 886E008B6E7300000000
6510DATA 0000000000000000000
6520DATA 0000000000000000000
6530DATA 1010101010165037503
6540DATA 6503790365038105950B
6550DATA 1010004100010000406C
6560DATA 0001000085D00000000
6570DATA 305401000000F0630100
6580DATA 0000004201000000D06B
6590DATA 0000000A04600000000
6600DATA 8855000000008B3C008B
6610DATA 3C5C8841008841E6B846
6620DATA 00B84617884B00B84B8A
6630DATA 8850008850B588550088
6640DATA 5545885A00B85ACF885F
6650DATA 00885FFD886400B864A1
6660DATA 8869008B692E886E008B
6670DATA 6E730000000000000000
6680DATA 0000000000000000000
6690DATA 000000000000883C0088
6700DATA 3C5C8841008841E6B846
6710DATA 00B84617884B00B84B8A
6720DATA 8850008850B588550088
6730DATA 5545885A00B85ACF885F
6740DATA 00885FFD886400B864A1
6750DATA 8869008B692E886E0088
6760DATA 6E730000000000000000
6770DATA 0000000000000000000
6780DATA 0000000000000000000
6790DATA 0000000000000000000
6800DATA 0000000000000000000
6810DATA 0000000000000000000
6820DATA 0000000000000000000
6830DATA 0000000000000000000
6840DATA 0000000000000000000
```

British Telecommunications plc.

The plot continues

Part Two of a graph plotting routine for the QL written by ***John Cochrane***

Space does not permit me to present a full line-by-line description of the program and it's workings. The following should give you a general idea of what's going on though and will give you sufficient clues to work through the details by yourself.

Program notes

Lines 150 to 290 control the running of the program. I have not attempted to be too clever in terms of program layout, I needed the thing to be simple to follow rather than fast or compact. Also, I have not made the program fully foolproof, put in silly data and it's your own fault if you get rubbish out. The program waits for you to press a key (Line 260) to end.

Procedures *Start-Up* and *Read-Data* set up the input data and initialise certain variables which specify the display special mention. 'line-type()' determines the type of curve fit; zero for no curve, one to four for a polynomial of order one to four, and five for a line joining each data point (data is sorted by increasing x-value). Don't use over-long titles, the main title can be up to 29 characters long, the axis titles up to around 20 characters each, and the key-descriptions up to around 12 characters.

Procedure *Find-Fit* contains the least-squares curve-fitting algorithms. Don't ask me to explain this lot, if you really want to get into this sort of thing then I suggest you read a book by Terry E. Shoup called *Numerical Methods for the Personal Computer* (Prentice-Hall). There are other ways to fit curves to data, spline-functions for example, which you may like to add here.

Automatic scaling is provided by procedures *Find-Scale* and *Get-Scale*. Different people like to scale their graphs in different ways. The most important factors are set in Lines 1990 to 2090. These set the permissible intervals between graph grids. The various "complications" in lines 2030-2080 are there to try and set sensible values for the axis end-points, if possible, *Get-Scale* sets zero at the plot origin.

A blank graph is plotted by procedures *Draw-Graph* and *Draw-Axes*, which make use of the plotting routines *Move-To-xy* and *Plot-To-xy*. The plotting routines are set up as separate routines because I wanted to be able to easily convert the program to output to a plotter or plotting-printer. This wastes a little space but increases versatility. If you want to dispense with this feature then you should be able to replace most of the *Plot-To-xy* calls with *Line-R* and also dump the variables *'old-x'* and *'old-y'* at the same time.

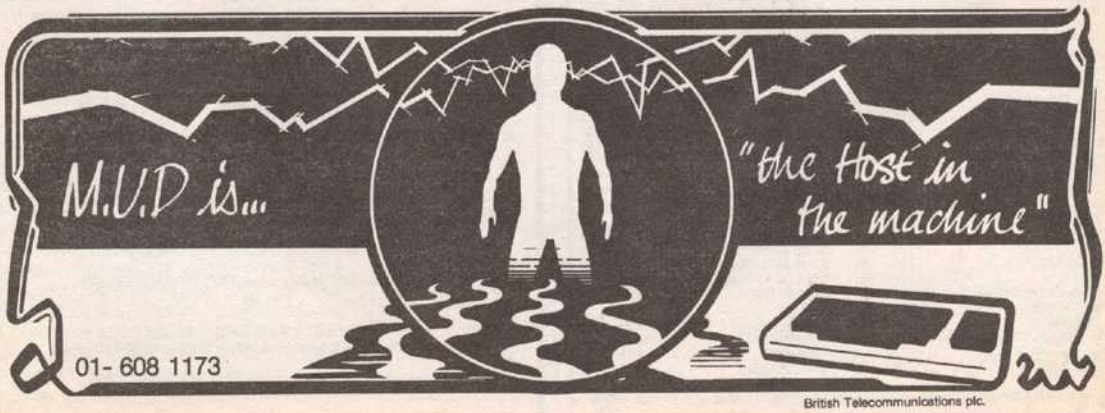
The data itself is plotted by procedures *Plot-Data*, *Mark*, *Plot-Cross*, and *Plot-Poly*. In extreme cases you may find that the curve goes off the graph area. The only easy thing to do in this eventuality is to try to fit a lower order curve to the data.

Finally, a key is displayed at the bottom of the screen (by *Print-Key*) to show what is what. The procedure *Get-Mum* is used to define four-character strings for the numbers to be used when annotating the axes.

I hope that most of the variable-names are self-explanatory and that you will be able to follow most of the program's workings. Drop me a line through *Popular* if you want more information.

```
1730      END FOR K
1740      IF temp_1=0 THEN N=data_points(n_line)
1750    END FOR N
1760    IF x_min>x(n_line,1) THEN x_min=x(n_line,1)
1770    IF x_max<x(n_line,data_points(n_line)) THEN
1780      x_max=x(n_line,data_points(n_line))
1790    END IF
1800    FOR K=1 TO data_points(n_line)
1810      IF y_min>y(n_line,K) THEN y_min=y(n_line,K)
1820      IF y_max<y(n_line,K) THEN y_max=y(n_line,K)
1830    END FOR K
1840  END FOR n_line
1850  REMark Scale axes......
1860  gen_min=x_min:gen_max=x_max
1870  GET_SCALE
1880  xs_min=scale_min:xs_max=scale_max
1890  x_ivl=scale_interval:x_power=scale_power
1900  gen_min=y_min:gen_max=y_max
1910  GET_SCALE
1920  ys_min=scale_min:ys_max=scale_max
1930  y_ivl=scale_interval:y_power=scale_power
1940 END DEFine FIND_SCALE
1950 :
1960 DEFine PROCedure GET_SCALE
1970   absolute_max=ABS(gen_max)
1980   IF absolute_max<ABS(gen_min) THEN absolute_max=ABS(gen_min)
1990   absolute_ivl=(gen_max-gen_min)/10
2000   IF absolute_ivl<(absolute_max/20) THEN absolute_ivl=absolute_max/20
2010   scale_power=INT(LOG10(absolute_ivl)+LOG10(2))
2020   IF absolute_ivl=.5*10^scale_power THEN scale_power=scale_power-1
2030   temp_1=absolute_ivl/(10^scale_power)
2040   temp_2=1
2050   IF temp_1>1 THEN temp_2=2
2060   IF temp_1>2 THEN temp_2=2.5
2070   IF temp_1>2.5 THEN temp_2=5
2080   scale_interval=temp_2*10^scale_power
2090   scale_min=scale_interval*INT(gen_min/scale_interval)
2100   temp_1=10-INT((gen_max-scale_min)/scale_interval)
2110   temp_2=scale_min-scale_interval*temp_1
2120   IF scale_min>=0 AND temp_2<=0 THEN scale_min=0
2130   IF scale_min<>0 THEN scale_min=scale_min-scale_interval*INT(temp_1/2
)
2140   scale_max=scale_min+10*scale_interval
2150 END DEFine GET_SCALE
2160 :
2170 DEFine PROCedure DRAW_GRAPH
2180   REMark Set up blank graph etc.....
2190   CLS #1
2200   INK #1,7:PAPER #1,2:CSIZE #1,3,0
2210   CLS #1,3
2220   temp_1=INT(14.5-LEN(title$)/2)
2230   IF temp_1<0 THEN temp_1=0
2240   AT 0,temp_1:PRINT title$
2250   PAPER #1,0:CSIZE #1,0,0
2260   temp_1=INT(12-LEN(y_title$)/2)
2270   IF temp_1<0 THEN temp_1=0
2280   AT temp_1,0
2290   FOR K=1 TO LEN(y_title$)
2300     PRINT y_title$(K)
2310   END FOR K
2320   temp_1=INT(39-LEN(x_title$)/2)
2330   IF temp_1<0 THEN temp_1=0
2340   AT 22,temp_1:PRINT x_title$;
2350   CSIZE #1,0,0
2360   IF y_power<0 OR y_power>1
2370     AT 1,0:PRINT "(*10^";y_power;")"
2380   END IF
```

```
2390   GET_NUM ys_max,y_power
2400   AT 2,1:PRINT number$
2410   GET_NUM (ys_min+ys_max)/2,y_power
2420   AT 11,1:PRINT number$
2430   GET_NUM ys_min,y_power
2440   AT 20,1:PRINT number$
2450   GET_NUM xs_min,x_power
2460   AT 21,3:PRINT number$
2470   GET_NUM (xs_min+xs_max)/2,x_power
2480   AT 21,37:PRINT number$
2490   GET_NUM xs_max,x_power
2500   AT 21,71:PRINT number$;
2510   IF x_power<0 OR x_power>1
2520     AT 22,65:PRINT "(*";10^x_power;")"
2530   END IF
2540   DRAW_AXES
2550 END DEFine DRAW_GRAPH
2560 :
2570 DEFine PROCedure DRAW_AXES
2580   REMark Plot axes.....
2590   x_scale=x_axis_length/(xs_max-xs_min)
2600   y_scale=y_axis_length/(ys_max-ys_min)
2610   new_x=-2*tick_x:new_y=0:MOVE_TO_XY
2620   new_x=old_x+2*tick_x:PLOT_TO_XY
2630   FOR L=1 TO 10
2640     new_x=old_x+x_axis_length/10:PLOT_TO_XY
2650     new_y=old_y-tick_y
2660     IF L=5 OR L=10 THEN new_y=new_y-tick_y-...
2670     PLOT_TO_XY
2680     new_y=old_y+tick_y
2690     IF L=5 OR L=10 THEN new_y=new_y+tick_y
2700     MOVE_TO_XY
2710   END FOR L
2720   new_x=0:new_y=-2*tick_y:MOVE_TO_XY
2730   new_y=old_y+2*tick_y:PLOT_TO_XY
2740   FOR L=1 TO 10
2750     new_y=old_y+y_axis_length/10:PLOT_TO_XY
2760     new_x=old_x-tick_x
2770     IF L=5 OR L=10 THEN new_x=new_x-tick_x
2780     PLOT_TO_XY
2790     new_x=old_x+tick_x
2800     IF L=5 OR L=10 THEN new_x=new_x+tick_x
2810     MOVE_TO_XY
2820   END FOR L
2830   REMark Plot zero axes if req'd.....
2840   IF xs_min<0 AND xs_max>0 THEN
2850     new_x=x_scale*ABS(xs_min):new_y=0:MOVE_TO_XY
2860     new_y=old_y+y_axis_length:PLOT_TO_XY
2870   END IF
2880   IF ys_min<0 AND ys_max>0 THEN
2890     new_x=0:new_y=y_scale*ABS(ys_min):MOVE_TO_XY
2900     new_x=old_x+x_axis_length:PLOT_TO_XY
2910   END IF
2920 END DEFine DRAW_AXES
2930 :
2940 DEFine PROCedure MOVE_TO_XY
2950   old_x=new_x:old_y=new_y
2960 END DEFine MOVE_TO_XY
2970 :
2980 DEFine PROCedure PLOT_TO_XY
2990   LINE #1,old_x,old_y TO new_x,new_y
3000   old_x=new_x:old_y=new_y
3010 END DEFine PLOT_TO_XY
3020 :
3030 DEFine PROCedure PLOT_DATA
3040   REMark Plot the points.
3050   new_x=x_scale*(x(n_line,1)-xs_min)
3060   new_y=y_scale*(y(n_line,1)-ys_min)
3070   MOVE_TO_XY
3080   FOR L=1 TO data_points(n_line)
3090     new_x=x_scale*(x(n_line,L)-xs_min)
3100     new_y=y_scale*(y(n_line,L)-ys_min)
3110     IF line_type(n_line)=6 THEN
         PLOT_TO_XY :ELSE MOVE_TO_XY
3120     MARK
3130   END FOR L
3140   type_of_line=line_type(n_line)
3150   SELect ON type_of_line
3160     =1 TO 4
3170     PLOT_POLY
3180   END SELect
3190 END DEFine PLOT_DATA
3200 :
3210 DEFine PROCedure MARK
3220   SELect ON n_line
3230     =1
3240     PLOT_CROSS
3250     =2
3260     PLOT_SQUARE
3270     =3
3280     CIRCLE old_x,old_y,tick_x
3290   END SELect
3300 END DEFine MARK
3310 :
3320 DEFine PROCedure PLOT_CROSS
3330   new_x=old_x-tick_x:new_y=old_y-tick_y:MOVE_TO_XY
3340   new_x=old_x+2*tick_x:new_y=old_y+2*tick_y:PLOT_TO_XY
3350   new_y=old_y-2*tick_y:MOVE_TO_XY
3360   new_x=old_x-2*tick_x:new_y=old_y+2*tick_y:PLOT_TO_XY
3370   new_x=old_x+tick_x:new_y=old_y-tick_y:MOVE_TO_XY
3380 END DEFine PLOT_CROSS
3390 :
3400 DEFine PROCedure PLOT_SQUARE
3410   new_x=old_x-tick_x:new_y=old_y-tick_y:MOVE_TO_XY
3420   new_x=old_x+2*tick_x:PLOT_TO_XY
3430   new_y=old_y+2*tick_y:PLOT_TO_XY
3440   new_x=old_x-2*tick_x:PLOT_TO_XY
3450   new_y=old_y-2*tick_y:PLOT_TO_XY
3460   new_x=old_x+tick_x:new_y=old_y+tick_y:MOVE_TO_XY
3470 END DEFine PLOT_SQUARE
3480 :
3490 DEFine PROCedure PLOT_POLY
3500   x_coord=x(n_line,1):new_x=x_scale*(x_coord-xs_min)
3510   y_coord=B(1)+B(2)*x_coord+B(3)*x_coord^2+B(4)*x_coord^3+B(5)*x_coord
^4
3520   new_y=y_scale*(y_coord-ys_min)
3530   MOVE_TO_XY
3540   FOR L=x(n_line,1) TO x(n_line,data_points(n_line))+x_ivl/8 STEP x_iv
l/4
3550     x_coord=L:new_x=x_scale*(x_coord-xs_min)
3560     y_coord=B(1)+B(2)*x_coord+B(3)*x_coord^2+B(4)*x_coord^3+B(5)*x_coo
rd^4
3570     new_y=y_scale*(y_coord-ys_min)
3580     PLOT_TO_XY
3590   END FOR L
3600 END DEFine PLOT_POLY
3610 :
3620 DEFine PROCedure PRINT_KEY
3630   IF number_of_lines<2 THEN RETurn
3640   IF line_type(n_line)>0 THEN line_type(n_line)=6
3650   data_points(n_line)=2
3660   x(n_line,1)=xs_min+(n_line-1)*3.5*(xs_max-xs_min)/10
3670   y(n_line,1)=ys_min-(ys_max-ys_min)/6
3680   x(n_line,2)=x(n_line,1)+(xs_max-xs_min)/10
3690   y(n_line,2)=y(n_line,1)
3700   PLOT_DATA
3710   AT 23,16+(n_line-1)*23:PRINT key$(n_line)
3720 END DEFine PRINT_KEY
3730 :
3740 DEFine PROCedure GET_NUM (number,power)
3750   SELect ON power
3760     =0 TO 1
3770       number$=""    "&INT(number+.5):number$=number$(LEN(number$)-4 TO)
3780     =REMAINDER
3790       temp_1=1E-2*INT(100*number/(10^power)+.5)
3800       number$="     "&temp_1:number$=number$(LEN(number$)-4 TO)
3810   END SELect
3820 END DEFine GET_NUM
```



CUT PRICE SOFTWARE

Spectrum	RRP	OUR PRICE
Now Games	8.95	6.95
Nightshade	9.95	6.95
Spy V Spy	9.95	6.95
Codename Mat II	8.95	6.95
Red Moon	6.95	5.50
Nick Faldo's Golf	9.95	7.95
That's The Spirit	7.95	5.50
Cauldron	7.99	5.99
Dynamite Dan	6.95	5.25
Elite	14.95	10.00
Dambusters	9.95	6.99
In. Karate	6.50	5.00
Daley's Super-Test	6.90	5.00
Street Hawk	6.90	5.00
Select One	12.50	5.00
Hypersports	6.95	5.95
Robin of Sherwood	9.95	7.00
Exploding Fist	8.95	6.95
Frankie G'T' Hollywood	9.95	7.25
F. Bruno's Boxing	6.95	5.25
Highway Encounter	7.95	5.95
Dun Darach	9.95	6.95
Rockford's Riot	9.95	7.25
Southern Belle	7.95	5.95

Special offer – Spectrum order. £20 or more ICICLE WORKS FREE with order.

Commodore	RRP	OUR PRICE
Elite	14.95	10.00
Now Games	8.95	6.95
Int. Karate	6.50	5.00
Nick Faldo's Golf	9.95	7.95
Ghostchaser	9.95	7.25
Speed King	9.95	7.25
Quake Minus 1	9.95	7.50
Pitstop 2	10.95	8.50
Robin of Sherwood	9.95	7.00
Blackwych (Ultimate)	9.95	7.25
Daley's Super-Test	7.90	6.00
Street Hawk	7.90	6.00
Hypersports	7.95	6.50
Frankie G'T' Hollywood	9.95	7.25
Exploding Fist	9.95	7.00
Codename Mat II	8.95	6.95
Summer Games II (disk)	14.95	10.00
Frank Bruno's Boxing	7.95	6.25
Beach Head II	9.95	7.25
Skytox	9.95	7.95
Summer Games II	9.95	7.25
Nodes of Yesod	9.95	7.25

Commodore order £20 or more FRAK FREE with order.

Amstrad		
Knight Lore	9.95	7.00
Alien 8	9.95	7.00
War Zone	7.95	6.00
Airwolf	8.95	7.50
Codename Mat II	8.95	6.95
Daley Thompson	8.95	6.50
Raid over Moscow	9.95	7.25
Brian Jack's Superstar	8.95	6.95
3D Stunt Rider	8.95	6.95
Beach Head	9.95	7.25
Transact	29.95	5.99
Red Arrows	9.95	7.95
Dun Darach	9.95	7.25
Exploding Fist	9.95	7.50
Starion	9.95	7.50
Invostat	29.95	5.99
Frank Bruno's Boxing	8.95	6.95
Arnham	8.95	6.50
3D Voice Chess	9.95	7.95
Binky	7.95	6.50
Sorcery II (Disk only)	14.95	10.95

AMSTRAD DISK SOFTWARE NOW AVAILABLE. Please ring for details Special Offer - Amstrad order. £20 or more FLIGHT PATH 737 FREE

P&P included. Overseas orders add 75p per tape. For Mail Order please send Cheques/PO payable to CPS Visa/Access Card orders by phone welcome, to:

CUT PRICE SOFTWARE, 4 Slacksbury Hatch, Harlow, Essex CM19 4ET
Tel: (0279) 24433 (24hr ansaphone)

PD816

A THRILLING FAST ACTION ARCADE ADVENTURE
SPECTRUM 48K AND AMSTRAD CPC 464/664

SPECTRUM 48K
£6·95

AMSTRAD CPC 464/664
£6·95

Scattered about the vast subterranean complex are 64 fragments of parchment that when correctly assembled will give you all the knowledge of your people's culture – Your task as the last survivor of your ancestral race is to assemble the covenant and repopulate the desolate surface of your planet with the animals that live in the caverns.

P.S.S. 452 STONEY STANTON RD. COVENTRY CV6 5DG. TEL. COVENTRY (0203) 667556

SOFT INSIGHT

SPECTRUM	RRP	OUR PRICE
ROBIN OF SHERWOOD	9.95	7.46
GLASS	7.99	5.90
ANY LEVEL 9 GAMES	9.99	7.20
SPY VS SPY	9.95	7.46
INTERNATIONAL KARATE	6.50	5.00
DYNAMITE DAN	6.95	5.20
ALIEN 8	9.95	7.46
CLUEDO	9.95	7.46
ILLUSTRATOR	14.95	11.21
THATS THE SPIRIT	7.95	5.96
SHADOWFIRE	9.95	7.46
DUN DARACH	9.95	7.46
NODES OF YESOD	9.95	7.46
ARCHON	9.95	7.46
RED MOON	6.95	5.20
FRANK BRUNO'S BOXING	6.95	5.20
HYPERSPORTS	7.95	5.96
MONOPOLY	9.95	7.46
THE FOURTH PROTOCOL	12.95	10.00
NIGHTSHADE	9.95	7.46
FAIRLIGHT	9.95	7.46
HIGHWAY ENCOUNTER	7.95	5.96
NICK FALDO'S GOLF	9.95	7.46
RED ARROWS	7.95	5.96
FRANKIE GOES TO HLYWOOD	9.95	7.46
DAMBUSTERS	9.95	7.46
EXPLODING FIST	9.95	7.00
THE ARTIST	12.95	10.00
BEACH HEAD	9.95	7.46
SCRABBLE	9.95	7.46
ANY AMSOFT GAMES	8.95	6.71
ANY LEVEL 9 GAMES	9.99	7.60
ALIEN 8	9.95	7.46
PROJECT FUTURE	7.95	5.96
DUN DARACH	9.95	7.46
EXPLODING FIST	9.95	7.40
3D STAR STRIKE	6.95	5.20
DALEY'S DECATHLON	8.95	6.71
BRIAN JACKS	7.95	5.96
KNIGHTLORE	9.95	7.46
THE COVENANT	8.95	5.20
HANDICAP GOLF	7.95	5.96
GREMLINS	9.95	7.46
COMPILER	34.95	28.95
EVERYONE'S A WALLY	9.95	7.46
BRIAN BLOODAXE	8.95	7.00
GRAND PRIX II	8.95	6.71
AIRWOLF	8.95	6.71
ALIEN 8	8.95	6.71
RED ARROWS	9.95	7.46
RED MOON	6.95	5.20
MASTERFILE	24.95	18.95
F. BRUNO'S BOXING	8.95	6.71

BBC

KNIGHTLORE	9.95	7.46
COMBAT LYNX	8.95	6.71
BEACH HEAD	9.95	7.46
MATCHDAY	9.95	7.46
ALIEN 8	9.95	7.46
ATIC ATAC	7.95	5.96
REVS	14.95	11.21

DISCOUNT SOFTWARE

RED MOON	6.95	5.20
COMMODORE		
ANY OF US GOLD	9.95	7.46
ANY ACTIVISION	9.95	7.46
ANY LEVEL 9	9.99	7.46
PIT STOP II	9.95	7.46
IMPOSSIBLE MISSION	8.95	6.71
SKYFOX	9.95	7.46
WIZARDRY	9.95	7.46
THEATRE EUROPE	9.95	7.46
SHADOWFIRE	9.95	7.46
ELITE	14.95	11.21
SUMMER GAMES II	9.95	7.46
EXPLODING FIST	9.95	7.20
BLACKWYCH	9.95	7.46
HYPERSPORTS	7.90	6.20
NODES OF YESOD	9.95	7.46
NICK FALDO'S GOLF	9.95	7.46
FRANKIE GT HOLLYWOOD	9.95	7.46
TOUR DE FRANCE	9.95	7.46
BEACH HEAD II	9.95	7.46
STEVE DAVIS SNOOKER	9.95	7.46
ATARI		
MIG ALLEY ACE	9.95	7.46
BOUNTY BOB	9.95	7.46
STRIP POKER	9.95	7.46

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

PD107

POPULAR COMPUTING WEEKLY Back Issues

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

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

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

..... Total £.....

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

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

Name .....

Address .....

.....

.....

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

BARGAIN SOFTWARE

Dept PCW2, Unit 1, 1 Esmond Road, London W4 1JG
Phone orders welcome ring 01-995 2763

SPECTRUM	RRP	Our Price
THE ARTIST	12.95	10.50
ALIEN 8	9.95	7.50
ARCHON	10.95	8.95
CAULDRON	7.99	5.99
DYNAMITE DAN	6.95	5.25
DAM BUSTERS	9.95	7.50
HYPERSPORTS	7.95	5.95
SOUTHERN BELLE	7.95	5.95
JET SET WILLY II	6.95	5.25
DUN DARACH	9.95	7.50
EMERALD ISLE	6.95	5.50
EVERYONE'S A WALLY	9.95	7.50
FOOTBALL MANAGER	6.95	5.25
FORMULA 1	7.95	5.95
FRANKIE/HOLLYWOOD	9.95	7.50
EXPLODING FIST	8.95	6.70
FRANK BRUNO'S BOXING	6.95	5.25
GRAND NATIONAL	6.95	5.25
GREMLINS	9.95	7.50
HERBERT'S DUMMY RUN	9.95	7.50
SPY vs SPY	9.95	6.50
MEGA HITS (10 TOP TITLES)	19.95	9.50
METABOLIS	6.95	5.25
MONOPOLY	9.95	7.50
MORDONS QUEST	6.95	5.25
NODES OF YESOD	9.95	7.50
RAID OVER MOSCOW	7.95	5.80
RED MOON	6.95	5.95
ROCKY	7.95	5.95
ROCKY HORROR SHOW	8.95	6.70
SHADOW FIRE	9.95	7.50
SPY HUNTER	7.95	5.95
STARION	7.95	5.75
SQUASH	7.95	5.95
VIEW TO A KILL	10.99	8.50
SUPERPIPELINE II	7.95	5.95
VALHALLA	14.95	3.99
HIGHWAY ENCOUNTER	7.95	5.95
NIGHTSHADE	9.95	7.50
JUGGERNAUT	7.95	5.95
NOW GAMES (VIRGIN COMPIL)	8.95	6.70
POLE POSITION	7.99	2.99

COMMODORE 64	RRP	Our Price
ARCHON	11.95	9.50
GRAHAM GOOCH'S CRICKET	9.95	7.50
BLAGGER GT HOLLYWOOD	9.95	7.50
BULGE THE	9.99	7.50
CAULDRON	7.99	5.95
ROMPER ROOM	9.95	7.50
GHETTO BLASTER	8.95	6.70
DAMBUSTERS	9.95	7.50
ELITE	14.95	11.20
ENTOMBED	9.95	7.50
DROPZONE	9.95	7.50
EVERYONE'S A WALLY	9.95	7.50
HYPERSPORTS	8.95	6.70
FIVE-A-SIDE	5.95	4.99
GATES OF DAWN	8.95	7.25
INTERNATIONAL TENNIS	5.99	4.99
GREMLINS	9.95	7.50
HERBERT'S DUMMY RUN	9.95	7.50
IMPOSSIBLE MISSION	9.50	7.50
INT. BASKETBALL	5.99	4.50
INT. SOCCER (ROM)	14.99	11.95
JET SET WILLY II	8.95	6.50
JUMP JET	9.99	7.50
VIEW TO KILL	10.99	8.50
MEGA HITS (10 TOP TITLES)	19.95	9.99
MUSIC STUDIO	14.95	12.95
PIT STOP II	9.95	7.50
ROCKFORD'S RIOT	9.95	7.50
SHADOW FIRE	9.95	7.50
EXPLODING FIST	9.95	7.50
ROLAND'S RAT RACE	7.90	6.20
SLAP SHOT	8.95	6.50
SPITFIRE 40	9.95	7.50
SUMMER GAMES	14.95	11.20
SUPER HUEY	8.95	6.50
SUPER PIPELINE 2	8.90	6.50
THING ON A SPRING	7.95	5.95
THEATRE EUROPE	9.95	7.50
SUMMER GAMES	cass 9.95	7.50
	disc 14.95	11.20
NOW GAMES	8.95	6.70
GHOSTCHASER	9.95	7.50

ALL PRICES INCLUDE P&P. OVERSEAS ORDERS PLEASE ADD £1 PER TAPE

PD586

TIPSTER
SPECTRUM + /48
AMSTRAD CPC464/COMMODORE 64

The most accurate horse race predictor on the market

- ★ Tipster V2 took 18 months of trial and error before we arrived at the system that makes it the most accurate race predictor on the market.
- ★ Fully tested against other computer race predictors.
- ★ Tipster even performs better than the human tipsters from the top nine newspapers.
- ★ Many winners found at high prices.
- ★ For both flat and national racing.
- ★ The system will never go out of date.
- ★ We reveal the secrets of profitable betting.
- ★ Special tutor for the absolute beginner to racing.
- ★ Tipster also includes a program to calculate your returns for you.

If you can buy a more accurate race predictor we'll refund your money

Don't be tempted to buy cheap or inferior products.
£14.95

E. I. SYSTEMS
PO Box 171, Wolverhampton, West Midlands WV10 0PJ

Leaves all other race predictors in the paddocks.
(Please state computer)

PD133

Colour swapping

Animate your figures by colour swapping on the 464 – from ***J W Constable***

Colour swapping is a technique possible on machines such as the Amstrad and BBC that allows the colour of 'pens' that have been used to print or draw to be changed. On the Amstrad the technique works like this.

Pens one to 15 are used to draw – for instance – 15 adjacent, parallel lines. Then all Pens are filled with *Ink* the same colour as the *Paper* which in this case will be set to zero (let us say that this background is black). This means that all the coloured lines effectively disappear as far as the eye is concerned. However, they are actually still there but coloured black.

Now if the *Ink* in each Pen in turn is changed to, let us say, blue and then back to black again, a single line appears to move across the screen. If this process is now extended to pictures or various stages of a rotating shape then the result is very fast animation.

The Lissajous Figures program is one which uses this colour swapping technique. The plotting can be speeded up by increasing the *Step* rate in Line 140, but the larger it gets the more the lines start to break up. The animation can be speeded up or slowed down by altering the 'wait' loops in Lines 230 and 270.

For this particular plot, as half of the pattern repeats itself going in the opposite direction it is possible to draw twice the amount of positions of the figure in half a cycle, and then step backwards through the colours in the animation section as well as forwards to complete the second half of the rotation. To see what I mean delete Lines 250 to 280 to see just half the cycle.

Line 150 may be altered and experimented with to produce different Lissajous figures or plots of other functions, but the associated lines and *For/Next* loops must be changed to customise the program to produce the best effect for the new function, as they were with this example.

When using the technique two main things must be remembered. Firstly, whatever is plotted must only have 15 stages (although the Lissajous Figures program effectively has 30 because half of it is repeated). This is because 15 is the maximum number of Pens allowed in *Mode 0* excluding one Pen for the *Paper* or background.

Secondly, if one part of a plotted shape is superimposed on another part of a previous shape in the previous Pen, then that part of the previous shape will be overwritten and lost, so try to avoid this. You can see what I mean from the early stages of the Figures program. The problem is more pronounced in *Mode 0* where the pixels are bigger and more likely to overlap, so if the thing that you are animating can be done with a total of four Pens (including one background or *Paper* Pen) then use *Mode 1*.

The *On Break Gosub* statements in Line 60 and 300 are to prevent the program from being stopped and leaving the user with an unusable set of *Inks* – a common problem when breaking out of a program that uses colour swapping. The *Call &BBFF* resets the Pen *Inks* to default values. I found the *Mode 1* command necessary because the machine code call appears to corrupt *Mode 0* by mixing it with *Mode 1*. Delete the *Mode 1* in Line 300 to see what I mean.

I leave you with the second program which I think is more impressive.

```
10 '====================
20 '=lissajous figures=
30 '=  demonstration  =
40 '====================
50 '
60 ON BREAK GOSUB 300
70 MODE 0
80 DEG
90 m=130
100 ORIGIN 320,200
110 b=0
120 FOR p=0 TO 180 STEP 180/14
130 b=b+1
140 FOR t=0 TO 360 STEP 1.5
150 PLOT SIN(t+p)*m,SIN(t)*m,b
160 NEXT t
170 NEXT p
180 FOR b=1 TO 15
190 INK b,1
200 NEXT b
210 FOR b=2 TO 15
220 INK b-1,1:INK b,23
230 FOR w=1 TO 20:NEXT w
240 NEXT b
250 FOR b=14 TO 1 STEP -1
260 INK b+1,1:INK b,23
270 FOR w=1 TO 20:NEXT w
280 NEXT b
290 GOTO 210
300 MODE 1: CALL &BBFF
```

```
10 '
20 '**********************
30 '*                    *
40 '*  3D ROTATING CUBE  *
50 '*                    *
60 '**********************
70 '
80 MODE 0
90 ORIGIN 320,200
100 DIM x(50),y(50),z(50)
110 m=100
120 DEG
130 FOR i=1 TO 15:INK i,9:NEXT i
140 BORDER 0:PAPER 0:INK 0,0:CLS
150 FOR c=1 TO 17
160 READ x(c),y(c),z(c)
170 NEXT c
180 p=0
190 FOR t=1 TO 90 STEP 6
200 p=p+1:IF p=16 THEN p=1
210 MOVE ((x(1)*COS(t)-y(1)*SIN(t))
+z(1)/2)*m,((x(1)*SIN(t)+y(1)*COS(t
))+z(1)/2)*m
220 FOR c=1 TO 17
230 DRAW ((x(c)*COS(t)-y(c)*SIN(t))
+z(c)/2)*m,((x(c)*SIN(t)+y(c)*COS(t
))+z(c)/2)*m,p
240 NEXT c
250 NEXT t
260 FOR i=1 TO 15:INK i,0:NEXT i
270 FOR i=1 TO 15
280 INK i-1,0:INK i,9
290 FOR q=1 TO 50 :NEXT q
300 NEXT i
310 INK 15,0
320 GOTO 270
330 DATA 1,1,1,1,1,1,-1,1,1,-1,1,-1
,1,1,-1,1,1,1,1,-1,1,-1,-1,1,-1,-1,
-1,1,-1,-1,1,-1,1,1,-1,-1,1,1,-1,-1
,1,-1,-1,-1,-1,-1,-1,1,-1,1,1
```

Numbered in full

Spoken numbers on the 64 (with the Currah Speech Unit) courtesy of ***Chris Cattanach***

The Currah Speech Unit has developed a reputation as one of the more versatile speech units. Unlike units which have a limited "fixed" vocabulary, the Currah's speech chip allows one to build up any word one desires from a suitable combination of allophones.

One drawback of the speech, where numbers are concerned, is that all numbers greater than ten are read out as a single series of single digits. Thus 123 is spoken as one two three, instead of as one hundred and twenty three.

Developed on the Currah Commodore 64 speech unit, this program rectifies this situation, and allows numbers entered to be spoken correctly. The program caters for all numbers up to 999,999,999 (nine hundred and ninety-nine million, nine hundred and ninety-nine thousand, nine hundred and ninety-nine), which should be entered without the commas. Decimals are catered for up to two decimal places, but this could easily be extended if desired. It has only been limited to avoid the repetition of a large number of zero's.

Program Notes

The main program lies between Lines 8900 and 10020 and is accessed by a *Gosub* command incorporated in Lines 1-23 at the beginning of the program. The program can thus be easily incorporated into one's own program, which can lie between Lines 30 and 8899.

When the program is *Run*, the number to be spoken is entered at Line 22. Lines 9000-9003 decide if the number is an integer or a decimal.

Lines 9070-9299 determine the length of the number entered, in order to allocate the necessary words used in speaking it. Some numbers are spoken in a unique way (eg, numbers 10 to 19, ... hundred, ... million, etc), and this is catered for in Lines 9304-9324 and 10000-10020. To get out of the counting program, one enters the double symbol ££.

If this program is used in conjunction with one's own program, certain constants should be avoided to avoid confusion. These are as follows: *C1S-C9S, D1S-D9S, ES, E1S, E2S, G1S, RS, HNS, MLS, THS, F1, F2, E%, E3S,* and *Z1S.*

```
1 REM"VOICED NUMBERS"
2 PRINT"VOICED NUMBERS BY C.J.CATTANACH"
3 POKE53281,7
5 INIT
20 GOSUB10000
22 GOSUB8992:GOSUB8902:GOSUB9430:F2=0:F1=0:
   INPUTE$
23 GOSUB9000
8900 GOTO22
8902 IFF1=1THEN9354
8903 IFF1=2THEN9358
8904 IFF1=3THEN9375
8905 IFF1=4THEN9389
8906 IFF1=5THEN9421
8907 IFF1=6THEN9378
8999 RETURN
9000 IFVAL(E$)-INT(VAL(E$))=0THEN9005
9002 Z1$=STR$(INT(100*(VAL(E$)-INT(VAL(E$))
   ))/100):E$=STR$(INT(VAL(E$))):F2=9
9003 E9%=LEN(E$):E$=MID$(E$,2,E9%-1)
9005 E=VAL(E$):E%=LEN(E$)
9010 IFE$="££"THEN9013
9011 GOTO9070
9013 KOFF
9014 STOP
9070 IFE%=9THEN9420
9072 IFE%=8THEN9387
9074 IFE%=7THEN9369
9075 IFE%=6THEN9357
9076 IFE%=5THEN9352
9077 IFE%=4ANDRIGHT$(E$,3)="000"THEN9338
9078 IFE%=4ANDRIGHT$(E$,3)<>"000"THEN9341
9080 IFE%=3ANDRIGHT$(E$,2)="00"THEN9330
9081 IFE%=3ANDMID$(E$,2,1)="0"THEN9362
9082 IFE%=3ANDRIGHT$(E$,2)<>"00"THEN9333
9084 IFE%=2ANDVAL(E$)<20THEN9304
9085 IFE%=2ANDRIGHT$(E$,1)="0"THEN9316
9086 IFE%=2AND(RIGHT$(E$,1))<>"0"THEN9325
9090 IFE%=1THEN9300
9299 STOP
9300 SAYE$
9301 GOTO9500
9304 IFE$="10"THENSAYD1$
9305 IFE$="11"THENSAYC1$
9306 IFE$="12"THENSAYC2$
9307 IFE$="13"THENSAYC3$
9308 IFE$="14"THENSAYC4$
9309 IFE$="15"THENSAYC5$
9310 IFE$="16"THENSAYC6$
9311 IFE$="17"THENSAYC7$
9312 IFE$="18"THENSAYC8$
9313 IFE$="19"THENSAYC9$
9314 GOTO9500
9316 IFE$="20"THENSAYD2$
9317 IFE$="30"THENSAYD3$
9318 IFE$="40"THENSAYD4$
9319 IFE$="50"THENSAYD5$
9320 IFE$="60"THENSAYD6$
9321 IFE$="70"THENSAYD7$
9322 IFE$="80"THENSAYD8$
9323 IFE$="90"THENSAYD9$
9324 GOTO9500
9325 R$=E$:R%=E%:E$=LEFT$(E$,1)+"0":E%=LEN(E$)
9326 GOSUB9316:E$=R$:E%=R%
9327 E$=RIGHT$(E$,1):SAYE$
9329 GOTO9500
9330 E1$=LEFT$(E$,1):SAYE1$
9331 SAYHN$
9332 GOTO9500
9333 R$=LEFT$(E$,1):GOSUB9382
9335 SAY"AND"
9336 E$=RIGHT$(E$,2)
9337 GOTO9005
9338 R$=LEFT$(E$,1):SAYR$
9339 SAYTH$
9340 GOTO9500
9341 R$=LEFT$(E$,1):SAYR$
9342 SAYTH$
9343 IFRIGHT$(E$,3)="000"THEN9500
9344 IFMID$(E$,2,2)="00"ORMID$(E$,2,1)="0"
   THEN9346
9345 E$=RIGHT$(E$,3):GOTO9005
9346 SAY"AND"
9347 IFMID$(E$,2,2)="00"THEN9349
9348 E$=RIGHT$(E$,2):GOTO9005
9349 IFRIGHT$(E$,1)="0"THEN9500
9350 R$=RIGHT$(E$,1):SAYR$
9351 GOTO9500
9352 G1$=RIGHT$(E$,3):F1=1:E$=LEFT$(E$,2):
   GOTO9005
9354 F1=0:SAYTH$
9355 E$=" "+G1$:GOTO9343
```

```
9357 G1$=RIGHT$(E$,3):E$=LEFT$(E$,3):F1=2:
     GOTO9005
9358 SAYTH$
9359 F1=0:E$=01$:GOTO9355
9362 E1$=LEFT$(E$,1):SAYE1$
9363 SAYHN$
9364 SAY"AND"
9365 E1$=RIGHT$(E$,1)
9366 SAYE1$
9367 GOTO9500
9369 E1$=LEFT$(E$,1):E2$=RIGHT$(E$,3):SAYE1$
9370 SAYML$
9371 IFVAL(MID$(E$,2,6))=0THENGOTO9500
9372 E$=MID$(E$,2,3)
9373 IFE$="000"THEN9381
9374 IFLEFT$(E$,2)="00"ANDRIGHT$(E$,1)<>"0"
     THEN9380
9375 F1=0:IFVAL(LEFT$(E$,1))=0THEN9377
9376 E$=E$+E2$:GOTO9005
9377 E$=MID$(E$,2,2):F1=6:GOTO9005
9378 F1=0:SAYTH$
9379 E$=E2$:GOTO9373
9380 E$=MID$(E$,3,1)+E2$:GOTO9341
9381 E$=E2$:GOTO9005
9382 IFR$="0"THENRETURN
9383 SAYR$
9384 SAYHN$
9385 RETURN
9386 E$=RIGHT$(E$,2)+E2$:GOTO9005
9387 E3$=RIGHT$(E$,6):E$=LEFT$(E$,2):
     F1=4:GOTO9005
9389 SAYML$
9391 F1=0:E$=E3$:IFVAL(E$)=0THEN9500
9392 E2$=RIGHT$(E$,3):E$=LEFT$(E$,3)
9393 GOTO9394
9394 GOTO9373
9420 F1=5:E5$=RIGHT$(E$,6):E$=LEFT$(E$,3):
     GOTO9005
9421 F1=0:SAYML$
9422 S$=E5$
9423 IFVAL(E$)=0THEN9500
9424 E2$=RIGHT$(E$,3):E$=LEFT$(E$,3)
9425 GOTO9373
9430 IFF2=9THEN9432
9431 RETURN
9432 SAYZ1$
9433 GOTO9500
9500 KOFF
9501 RETURN
9999 STOP
10000 C9$="NINETEEN":C8$="EIGHTEEN":C7$=
      "SEVENTEEN":C6$="SIXTEEN"
10003 C5$="FIFTEEN":C4$="FORTEEN":C3$=
      "THURTEEN":C2$="TWELVE":C1$="ELEVEN"
10005 D9$="NINETY":D8$="EIGHTY":D7$="SEVENTY":
      D6$="SIXTEE":D5$="FIFTEE"
10007 D4$="FORTEE":D3$="THURTEE":D2$="TWENTEE":
      D1$="TEN"
10009 D2$="TWENTY":D3$="THURTEE":D4$="FOURTEE":
      D5$="FIFTEE":D6$="SIXTEE"
10011 D7$="SEVENTEE":D8$="EIGHTEE":D9$=
      "NINETEE"
10017 HN$="HUN'DRET":TH$="THOUSAND":ML$=
      "MILLYON"
10020 RETURN
```


POWERFUL UTILITIES

FOR YOUR SINCLAIR SPECTRUM

MAKE THE MOST OF YOUR MICRODRIVE WITH

INTERFACE III

THE IMPOSSIBLE HAS BEEN DONE

Yes it's true this **fantastic** new peripheral will transfer **every program available** on to microdrive. **Yes every one**. Yes, believe it or not, it is so **easy to use** that we are training our pet cat (Clive) to use it. **Anyone** capable of loading and saving a BASIC program can transfer **really awkward** programs to microdrive!

Just look at these features . . .

- **Consists of hardware and software (software on microdrive cartridge).**
- **Transfers all programs available on to microdrive.**
- **Very, very, easy to use. (If Clive can do it we're sure you can.)**
- **All programs reLOAD and RUN once transferred.**
- **Makes a "snapshot" of any stage of a program. (Saved as a screen.)**
- **Transfer can be actuated at any stage allowing "customised" versions.**
- **Will also save to tape. (Normal speed load once saved.)**
- **Programs will reLOAD independently of the "interface".**

IF YOU HAVE A MICRODRIVE YOU MUST HAVE INTERFACE III

ONLY £39.95 Inc. P&P

DOUBLER Mk.II

After **amazing success** on the CBM 64 we introduced "Doubler" on the Spectrum. Now we have improved it and have a **"Mark II"** version which has already satisfied hundreds of users. Requires the use of two cassette decks and has proved capable of **100% success** with all types of loader **regardless of length and speed.**

ONLY £14.95

B.B.C.

TAPE TO DISC UTILITY

The **"TD ROM"** is the most powerful utility of its type. It will transfer the **vast majority** of protected software onto your own discs. It is **VERY easy** to use and full screen reporting is provided.

Two versions are available, the normal Acorn DFS version plus one suitable for Opus/Solidisk DD/DOS.

ONLY £18.95

AMSTRAD

"SPEEDMASTER" allows you to make a fast **loading back up** of your software at a **choice of SAVE** speeds. Incorporates a header reader and deprotect BASIC option. Works on **ALL** normal Amstrad loaders.

ONLY £7.95

"DISCMASTER" allows you to transfer **most protected** software onto disc. The process is **automatic** and will work with multi part programs. **Supplied on disc.**

ONLY £12.95

DATA RECORDER

A **dedicated** data recorder designed for use on the CBM 64 or Vic-20. Specification as C2N but **with pause button.** Model available for the PLUS4 or 16 at same price.

SATISFACTION GUARANTEED.

ONLY £29.95

3M SCOTCH DISCS

Lifetime guarantee Box of Ten

SS/DD. **£16.00** DS/DD. **£23.00**

FOR YOUR COMMODORE 64

NEW DISC DISECTOR NEW V3.0

This **NEW VERSION** of "D.D." has once again proved it as the **leading copy/utility** package for the 1541 user. As well as general improvements, plus the addition of more useful utilities, two **important new programs** have been added.

"THE EVESHAM NIBBLER"

A **first** on the U.K. market. A **true nibbler** (byte for byte) copier. Copies **All** DOS errors automatically. This includes errors 20–29 inc. plus non standard errors like half tracks, extra tracks, non standard sync, renumbered tracks, etc. **No knowledge is required** at all it just "nibbles away" and produces a **perfect copy**. Yes it only takes 5–8 minutes. Has copied **all discs tested** (except itself). A class above anything else available.

"FAST FILE COPIER"

An **incredibly handily** selective file copier that **LOADs and SAVEs** at **five times** normal speed sounds useful? Too true.

As well as these programs **17 other** useful utilities are included. An essential purchase.

ONLY £29.95

Customers with earlier versions may return them along with £9.95 for "V3.0"

NEW QUICKDISC+ NEW

Get a **"QUICKDISC+" CARTRIDGE** plugged into your 64 and your 1541 will really start to perform. Unbelievable value.

Includes the following:

Fast LOAD and SAVE (four to five times normal speed). Will LOAD **most protected software**. Uses no memory area, can be switched in and out from the keyboard.

Fast Format takes just 10 seconds.

Fast Backup copies an entire disc in four minutes (not protected software).

Fast File Copier (selective).

Improved DOS commands (DOS 5.1) makes for easy use of the disc drive. e.g. $(RETURN) will LOAD and display a directory without overwriting BASIC. SHIFT RUN/STOP will LOAD "0*",8,1 etc. etc. Very useful.

Incorporates Centronics printer software (user port) **with CBM graphics** capability. (Works with Commodore Connexion.)

A RESET switch is fitted.

Now the price. No **not** £49.95, it's **not even half** that much. Can you afford to be without "QUICKDISC+"

ONLY £19.95

No internal connections needed and unlike most similar products it is compatible with printers and second drives.

DOUBLER

The **amazing** cassette port adaptor for the 64 is **still** keeping its **100% record**. Consists of hardware and **special software**. Requires the use of two data recorders. Tests have **proved conclusively** that "Doubler" can be **100% successful even with fast loaders**. They said it couldn't be done.

ONLY £12.95

STILL POPULAR

"DISCO"

Still **the best tape to disc** utility for normal speed loading tapes. Simple to use but rarely beaten.

ONLY £9.95

"FASTBACK"

Converts most slow loading tapes to **"turbo" load**. Single and multi part. Very easy to use.

ONLY £9.95

"BIG MOUTH"

A superb (yet) to speech synthesis program that is great fun to use. **Unlimited vocabulary.**

ONLY £7.95

"COMMODORE CONNEXION"

Software and cable for connecting any centronics type printer to the 64. Or use with **"QUICKDISC+".**

ONLY £17.95

"AZIMUTH 3000"

Allows you to check and realign your data recorder head alignment. Screwdriver provided.

ONLY £8.95

"THE ANATOMY OF THE 1541"

Get to grips with your 1541 with this **very detailed book**. Includes a full ROM disassembly.

ONLY £8.95

All prices include P&P and VAT. Send cheque. Postal Order or Credit Card No. Credit Card orders accepted by phone. Callers welcome. Wide range of goods stocked. Trade enquiries welcome. European orders send price as advertised. Outside Europe £2.00 for airmail. Mail order to Evesham Shop please.

Access VISA

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

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

Reflex skills

Continuing with Mike Williams' letter of Spectrum tips – amongst other goodies he has written a page on *Tir Na Nog* that I'll be passing on to Adventure Corner. He includes *Pokes* for games that have already been covered in the column, but there are still a fine crop of new ones for us.

"If you load *Gillingan's Gold* in with a Currah Speech unit fitted it will load but crash when it starts to run. It can then be saved at a normal speed which allows you to enter these pokes for infinite lives – *Poke* 52881,0 : *Poke* 52882,0 : *Poke* 52883,0. *Scuba Dive* – once loaded type L or S to load/save scores then *Break* and type *Poke 45696,0* to make your opponent's air go down quickly. *Cookie* – *Poke* 26197,0 stops the bin monster throwing things (hooray!). *Firebirds* – *Poke* 24164,n where n is up to 255. *Pyramid* – *Poke* 44685,0 for infinite energy. *Eureka* – *Clear* 23999 : *load* ""*code* : *Poke* 58117,0 : *Rand Usr* 58112 to bypass the arcade sections. *Booty:*

```
10 Border 0 : Paper 0 : ink 0
20 Clear 26870
30 Load ""screen$
40 Load ""code 26880
50 Randomise Usr 26880
60 Poke 58294,0
70 Randomise Usr 52500
```

Brian Bloodaxe:

```
10 Clear 64000
20 Print at 9,2; "play bloodaxe tape"; at 11,9;"from the start"
30 Restore
40 For n=23296 to 23374 : read a : poke n,a : next n
50 Randomise usr 23296
60 Data 6,3,197,221,33,0
70 Data 0,17,0,0,62,255
80 Data 55,205,86,5,193,16
90 Data 239,221,33,232,254,17
```

People frequently write about *Lunar Jetman* which they find Ultimate's most difficult and frustrating game. However, the high scores we get in from time to time show that there is a knack to it, indeed people have several methods to get through it. John Cousins writes care of BFPO 16: "On the first stage pick up the bomb and drop it on the rover, drive or teleport to the missile base and drop the bomb on top. The hardest part is dropping the bomb on to the buggy without missing and leaving huge craters everywhere – I find you can drop it on the front cab and it somehow reappears in the right place.

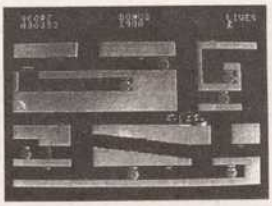
"On harder levels, unless you and the bomb are near the base, park the rover near one teleport and move the other as far from the base as possible. Return to the buggy for fuel or to avoid aliens. When the missile is launched you move from the teleport and blast away. The later levels have problems in the form of teleport snatching liens which dump them miles from anywhere and others that chase you all over the place. I have scored 115,000 on level 15. My other high scores are *JSW* finished, *Atic Atac* 99% and 100,000, *Sabre Wulf* 91% and 109,000, *Arcadia* 600 on level 9, *Jet Pac* 650,000 (I got bored after that), *Chuckie Egg* 347,000 on level 28 and *Micro Olympics* (CBM 64) 100 metres sprint in 6.33 seconds."

Added violence

Kel Ives of Coventry has scored 114,490 on level 10 and prefers to just wait at the rover until the missile appears and go for it in mid flight. He also favours putting the gun turret on the rover to bump up the score blasting aliens.

My own technique for the game is to surround the rover with craters, then get in it and cringe.

Brian Thompson of Beckenham has written in to say that he has finished *Pyjamarama* with 100%, which is an admirable feat but not normally still worth a mention since so have several thousand other people, but he goes on to ask when we will be reviewing the Amstrad version of *Archon* from Ariolasoft. I was unfamiliar with the game but it has also been very highly



recommended by Pete Gibson of Plymouth.

First the bad news – the Amstrad conversion has been delayed, and certainly won't be appearing before September – it seems that they have had some problems with it. (Similar reasons were given for the non-appearance of *Halls of the Things* on the Amstrad which is a shame.) The good news is that *Archon* is a very playable game – well worth a look when it does arrive.

Briefly it is a two player or one vs computer game where you play a wizard or sorceress who controls an army of weird creatures and spells, trying to knock hell out of the other side. It is set on a sort of high-tech chess board and each of your creatures have different strengths and movement, ratings etc. The fun comes from a mixture of action and strategy.

Original mix

In play it is very like a game that is never far from my Spectrum – *Chaos* from Games Workshop which works on a similar principle although without the pseudo chess aspects. Both represent a truly original mix between wargaming, strategy and arcade games and are a welcome change from multi-level platforms and cute sprites. They are also serious contenders for the best multi-player computer games you can buy, a direction that may become more and more important in the future.

Games Workshop was always a promising company – its releases were always cleverly designed games, although let down at times by their programming ability. Unfortunately they have withdrawn from the micro market so an Amstrad version is unlikely, but of the two, I would just pick *Chaos* as the best. It has severe flaws such as no abandon game option, but it does support up to eight players. In contrast, *Archon* puts heavier emphasis on reflex skills – having chosen the creatures to put into combat you must fight it out in real time and people who aren't so hot at finger work find that even their most powerful beasts are massacred by computer controlled wimps. Still, both are well worth a look.

Tony Kendle

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

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

Here's how it works

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

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

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

Game Wizard Entry Form

Micro .....

Game 1 score: .....

Game 2 score: .....

Game 3 score: .....

Name .....

Address .....

.....

.....

Your signature .....

Witness's signature .....

.....

Tony Bridge's Adventure Corner

Offers of help

Although this Corner should not be regarded as the Rubicon for adventurerers, nevertheless, it is an important part of the function. The Elf's mailbag is always full of not only pleas for help, but also offers of assistance. I assume that all these good people will not mind having their names and addresses mentioned here.

First of all, Hugh Walker. You've seen his name mentioned many times here, and he is always willing to help other adventurerers. If you write to him (including a SAE of course for a reply), his answer is sure to be as interesting as the adventure itself – he is very knowledgable on most of the good Spectrum games: 7 Burnet Avenue, Burpham, Guildford GU1 1YD.

Nick Carter is a very keen adventurer and would be very happy to help others with problems in *Mysterious Adventures, Lords of Time, Return to Eden, Erik the Viking, Emerald Isle, Heroes of Karn* . . . well, a lot anyway, you get the picture! His address is 6 Canberra Towers, Southampton SO2 9JT. Freddie Still has solved *Valkyrie 17, Hobbit, Urban Upstart* and *Ghost Town:* 2 School House, Wellclose Square, London E1. Andrew Hall offers help to BBC-ers in *Lords of Time, Colditz, Castle of Riddles, Philospher's Quest, Sphinx* and some of *Twin Kingdom Valley:* 4 Warwick Crescent, Rochester, Kent ME1 3LF.

If you have done some of *TKV*, you could probably help Andrew on his way – in fact, I always find that two or more players can crack an adventure in pretty short order, which is a very good (maybe the best) reason for corresponding with other adventureres. Bridget Ankers has managed to solve the whole of *TKV*, and so offers help to others less fortunate: 27 Holt Drive, Hooley Estate, Matlock, Derbyshire DE4 3BB.

Alison Richards, another BBC owner, has a large selection of games, so write to her for help: 112 Stockley Road, Barmston, Washington, Tyne and Wear NE38 8EQ.

John Wilson has sent me many interesting notes and observations about Spectrum adventures over the months (years!), notes which amount to yards and yards of print. While he has not specifically given his permission for mentioning his address, I hope he won't mind me doing just that, as he always has interesting comments to make: 26 Spotland Tops, Cutgate, Rochdale, Lancs OL12 7NX.

Scott Graham, appropriately, lives up in Scotland and has completed, among others, *Knight Quest* ("Probably one of the hardest I've played, and I include Level 9's"), *Lords of Midnight* and *Doomdark's Revenge* as well as *Valhalla*.

He is offering maps of the *Doomdark* series at £1 each, a practice I don't particularly approve of, but you can negotiate with him (and the phrase you need in *Emerald Isle*, Scott, is rather obscurely, Push Ceiling): 'Sirius', Mill Loch, Lochmaben, Dumfrieshire, DG11 1QA. Another Scot is Euan Terras, who offers his help in the Level 9s, *Sherlock, Urban Upstart, Hampstead* and so on: 9 Leslie Terrace, Prestwick, Ayrshire.

Help in return

While some adventurers are willing to give help, they would have also like some help in return. Richard and Marie Hawkins are happy to help with *Eureka!, Funhouse, Snowball, Ground Zero, Gremlins* and so on, but they are also having terrible problems with *Sherlock* and *Kentilla*. If you can help them, or need them to help you, write to: 16 Chancet Wood Drive, Sheffield S8 7TR. *Lords of Time* is one of the most popular and enduring of Level 9's games (where's the follow up, Sue?), and one of the many readers offering help in the adventure is Adam Jackson of 8 Mintern Close, Hedge Lane, Palmers Green, London N13 5SX.

Stuart Lorimor (Thorinslayer) wishes to exchange views with other adventurers about *Eureka!* as well as games like *Mountains of Ket* and the Middle Earth series from Level 9 and so on: 62 Devonshire Road, Aberdeen AB1 6XG.

Gary Candido has written several times to me, and I've mentioned his name before, but maybe not his address. He offers help on the usual range of Spectrum adventures *(Hobbit, Twin Kingdom Valley, Valhalla, Tombs of Xieops, The Pen and the Dark)*: 216 Brettell Lane, Amblecote, Stowbridge, West Midlands DY8 4BG. Richard Brown also offers help with the usual range, but has also finished *Bored of the Rings*. He found it rather easy (or at least, not as difficult as he would have liked), and rather inconsistent – in short, not the minor classic that the Grand Elf thought it was. However, he did have some kind thoughts about it, so if you want to share them, write to him at 58 Garth Heads, Quayside, Newcastle NE1 2JE.

More patience

Yet another helper for *Eureka!* – this is Ian Sumter, who says, "I don't think it's fair how you always take the mickey out of *Eureka!* It is a good adventure game, and I give it a rating of 9/10." I'm not *always* taking the mickey out of it, Ian, though I still find it almost unplayable. However, I realise that other people have more patience than I, and some of the problems are quite nice, I admit. Incidentally, the Dog (or Cod?) Latin in the Roman adventure was well spotted by you, and I agree with you about the carelessness in presentation. I'm afraid that I don't have room here for your excellent clues for this program – if readers would like some help, write to Ian at 10 All Saints Road, Chelmsford, Essex CM1 5HJ.

From a bit further away, Malcolm Schmidt offers help in several Commodore adventures, including the *Zork* series, lots of other Infocom games, *System 15000, Sherlock Holmes, Will o' the Wisp, Voodoo Castle* and the Level 9s. His problem is that he lives in South Africa, so finds it difficult to meet other adventurers. If you'd like to converse with him, his address is: PO Box 1276, Kelvin 2054, South Africa.

I could mention dozens more adventurers who have offered their help to others – as I've said before, interaction of this sort is one of the most interesting things about this hobby of ours. Next week, I shall mention some of the readers who are asking for help along with some hints and clues for various adventurers.

It would be well worth remembering, however, that most software houses will, if asked, give clues to their adventures. Don't be surprised, though, if you are asked to furnish some proof of your purchase of the game.

Adventure Helpline

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

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

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

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

Peek & Poke

Basic interpreter

Jonathan Dale of Codnor, Derbyshire writes:

Q I have a Vic 20 and am thinking of buying a Commodore 64. The literature says that the C64 has 38K of useable Ram with the Basic interpreter and 54K without it. What is this 'Basic interpreter'?

A The Basic interpreter is used to execute Basic statements (or programs). What Commodore are saying is that if you want to run Basic programs you can use up to 38K of memory (the C64 needs the rest for itself to support the interpreter), but if you are going to run machine-code programs you can utilise up to 54K of the memory, as the space reserved for Basic in the Ram is no longer required.

Machine-code assembler

Stephen Heath of Derby writes:

Q I own a 48K Spectrum and would like your advice on a good machine-code assembler for under £20. Also, do compilers convert all Basic to machine code?

A The Picturesque assembler is one of the best available and together with the monitor package also marketed by Picturesque make a major impact on machine code program development.

As to the compiler question the answer is usually no. You can check out what kinds of restrictions there are as normally these are clearly stated in the instruction booklets that come with the compilers.

The *Blast* compiler from Oxford Computer Systems claims, however, to handle all Basic commands, including strings.

Oxford Computer Systems can be contacted at Hensington Road, Woodstock, Oxford (0993 812700).

Software shortage

Matthew Dowse, of Stainforth, South Yorkshire, writes:

Q I own an Aquarius home computer, which, although Z80 processor-based, suffers from a shortage of software.

I would like to know whether a machine-code program for another Z80 computer (say the Spectrum) would run on my machine?

A Unfortunately not. There are a number of reasons for this. Most importantly the layout of the Ram and Rom in the two machines is totally different. Also, the difference in memory size make it impossible. The Spectrum has a 48K Ram, your Aquarius has considerably less.

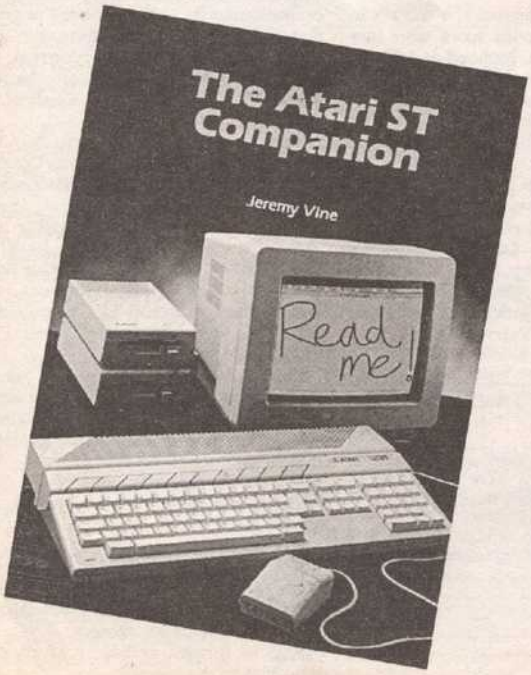
Loading problems

H A Manassei, of Eton, Windsor, writes:

Q I own a BBC Model B – one of the very first models – and I am having difficulty loading most of the recent programs. It loads and displays the first screen and then just displays 'Bad Program'.

A Your problem is that you have an old version of the BBC operating system. To overcome this you need to get your machine up-graded with the latest OS. This can be done by your dealer . . . almost while you wait.

Discover the Atari ST



Jeremy Vine's **Atari ST Companion** will tell you all you need to know if you're wondering whether to invest in the most talked-about new micro of 1985 — the Atari 520ST. Jack Tramiel's new wonder-machine offers you the "power without the price" — a 68000-based window, icon, mouse micro with the GEM graphics environment from Digital Research, all for £750.

The Atari ST Companion has been written with the benefit of full hands-on experience of the machine. Jeremy Vine begins with an overall look at the ST, followed by a detailed introduction to the GEM (Graphics Environment Manager) system. This offers facilities comparable with the much more expensive Apple Macintosh, including windows, pull-down menus and the facility to use a mouse to point to icons to replace typed commands.

Also covered is the Atari Intelligent Keyboard Controller, the very sophisticated sound system of the ST (which includes the industry-standard MIDI interface), the TDS operating system and the graphics LINE "A" interface.

So, whether you are already the proud owner of a new ST, or just thinking of learning more about this revolutionary new micro, send off today for this great new Sunshine book.

Please send me
_____ copies of The Atari ST Companion @ £9.95 each.
☐ I enclose a cheque/postal order for £_____ payable to Scot Books
☐ Please debit my Visa/Access card no._____
valid from_____ expires end:_____
Signed:_____
Name:_____
Address:_____

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

CLASSIFIED

Semi-display — £7 per single cc (inc. VAT)
Lineage — 30p per word (inc. VAT)

CALL DAVID OSEN on *01-437 4343* FOR SEMI/DISPLAY ADVERTISING

ACCESSORIES

BLANK CASSETTES

WITH LIBRARY CASES

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

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

5¼" DS/DD DISKS

10 for £13.00 inc plastic case

QL CENTRONICS PRINTER INTERFACE

only £28 inc P&P
Manufactured by RAM Electronics
RING US NOW! (0793) 695034
UK HOME COMPUTERS, 82 CHURCHWARD AVE, SWINDON, WILTS SN2 1NH PL305

DK'TRONICS speech synthesizer for Amstrad, brand new, won't work with my disc drive, £30 ono. Swaps considered. Tel Workington 64493.

Self Adhesive Cassette & Disk Labels

CASSETTE LABELS – On A4 sheets, 12 labels per sheet, 100 labels – £3.50, 1000 – £21.85
Rolls of 500 labels, on tractor feed backing paper for overprinting by computer printer.
White – £14.66. Tints available – Blue, Yellow, Pink, Green, Orange or Grey – £16.99.
DISK LABELS – Rolls of 500 labels on tractor feed paper: White – £12.75. Tinted – £15.

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

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

AMSTRAD/BBC, COMMODORE, SPECTRUM

Are you a manic arcade player; A dedicated adventurer/strategist; or do you want an independent, no nonsense critical review of current software/utilities? Whichever, we have the brochure(s) for you! Based on the formula which has already produced the highly successful Hints and Pokes brochures, we are now able to offer not 1 but 7 individually tailored brochures specific to your machine and interests.

For further information on the above and our other computing services send an SAE to:
H&D Services (PCW), Freepost (no stamp required), Manchester M11 2FA. Tel: 061-370 5666. PL500

CBM64 reset switch, escape crashes and recover most unstoppable/Autorun M/C programs, only 2in long, no dangling wires or boxes. Free tips supplied, £2.50. To C. Maarof, 54 Woodlands Road, Crumpsall, Manchester M8 7NF.

MAGAZINES

DRAGON USER

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

WANT TO BUY back issues any magazines, for EX81 and Spectrum computers, also original software and peripherals, need English contact for shipper to USA. Please contact Dallas Swindal, 1112 San Jose Lane, Hanahan, SC USA 29406.

Only for commodore HORIZONS

COMMODORE HORIZONS
Special offer! For a limited period only!
Take out a year's subscription to Commodore Horizons now and receive one of three Sunshine books – *absolutely* free! Simply send us £10, together with your name and address and your choice of book to:
Commodore Horizons, Special Subs Offer
12-13 Little Newport Street
London WC2H 7PP
Don't delay – post now!
Books
1 Machine code graphics & sound on C64
2 Artificial intelligence on C64
3 Building with Logo on C64
PL186

UTILITIES

EPROMS
HITACHI 27128 250ns
only £4.75 inc P&P
Cheques to: **D. Woolgar**
6 Central Way, Carshalton
Surrey SM5 3NF
PL503

MICRODRIVE SOLVED

The Microdrive is without doubt an economical and practical solution to high speed loading of your progs and games. Unfortunately Sinclair does not help with the many problems.

ZX-GUARANTEED has a range of tapes etc, plus the international postal Microdrive-Exchange Newsletters to solve vast majority of problems.

A 13p stamp/international coupon brings you a list of all items.

ZX-GUARANTEED (Dept PCW)
29 Chadderton Drive, Unsworth
Bury, Lancs BL9 8NL
Tel: 061-766 5712 PL499

EPROMS 27128 stock clearance, genuine unused, first class, 250us parts, £3.50 each inclusive. Security Soft Ltd., Unit 19, Derby Trading Estate, Stores Road, Derby DE2 4BE.

SPEEDFILE FOR THE 48K SPECTRUM +

The ULTIMATE MEGA FAST all micode filing system. Micro-Drive and Tape Compatible FEATURES: 36.8K user space * Search less than 1 sec * Random search * Output to Screen or Printer * Edit * Space remaining * List * Fast entry * Easy to use * Items alphabetical. Excellent for: Record collection * Film * Video file * Stamps * Names/addresses * Magazine index. In fact anything that requires very fast listing/searching of multiple items. Program supplies on Cassette with demo file.

Only £5.90

D. Foote
7 Rushlade Close
Paignton, Devon TQ4 7BZ PL507

SPECTRUM WORKSTATIONS
BANKRUPT STOCK
Were **£21.90** now **£5.95** + £2.50 P&P.
Also workstation and keyboard.
Was **£47.50** now **£19.95** + £2.50 P&P.
Both as advertised in Sinclair User and at Microfair. Few only remaining. Cheque/PO to:
Fern Hill, St Quentins Close, Llamblethian, Cowbridge, South Glamorgan. PL513A

AMSTRAD

THE AMSTRAD Programmers Notebook. A wealth of hints, tips and inside information about your Amstrad micro, no Amstrad user can afford to be without a copy of this book. Only £4.50 inclusive. Tape-disc: Get the one which works, handles relocation of machine code programmes – ASCII files – comes on tape to save you money. Free disc deprotect included, only £6.99 inclusive. Overseas orders please add £1 post and packing. For immediate despatch and cheque or p.o to: P.C.S. (Dept PCW), 176 Todmorden Road, Burnely, Lancs. BB11 3EU, England.

IDLE MEDDLER for AMSTRADS
THE MEDDLER voted "BEST BUY" of 5 similar by AMSCLUB, has now been upgraded and includes TAPE to DISC, and HEADER INFORMATION. A number of other extras for TAPE to TAPE transfer are added. IDLE MEDDLER now offers:
CHOICE of 6 tape speeds, plus a special binary save. DEPROTECTS TAPE or DISC files, and alters filenames to suit AMSDOS. A full HEX and CHAR. dump from RAM or ROM is included.
NOW all you need in one program, get that long loader on to DISC or FAST TAPE automatically.
STILL ONLY £4.50 inc By return, from
NEMESIS (pcw) 10 CARLOW RD, RINGSTEAD KETTERING, NORTHANTS NN14 4DW PL488

RECRUITMENT

Amstrad Computer User
requires an experienced
ADVERTISMENT MANAGER

Amstrad Computer User is the leading magazine for users of Britian's most successful new computer. Knowledge of the home and business computer market is useful but not essential. If you have a proven selling ability and want to fight with the winner then call (0277) 230222 or write (in confidence) to:

William Poel
Managing Editor
Amstrad Computer User
169 Kings Road
Brentwood
Essex, CM14 4EF

CLASSIFIED ADVERTISING RATES:

Line by line: 30p per word, minimum 20 words.

Semi-display: £7 per single column centimetre, minimum length 2 cm. (Please supply A/W as PMT. Or supply rough setting instructions.)

These rates include VAT.

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

If you wish to discuss your ad, PLEASE RING David Osen 01-437 4343.

Here's my classified ad.

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

		Please continue on a separate sheet of paper	

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

Name .....

Address .....

.....

.....

Telephone .....

Please cut out and send this form to: Classified Department, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP.

SOFTWARE

WDSoftware

FOR THE QL

WD Utilities (3rd ed) **(base £5.50)**
PRINT 60-file DIRectory or view it on one screen, one-key LOAD, COPY or PRINT 60 files with one key (allows for namesakes). Multiple FORMATting to prevent corruption by stretching of tape. TOOLkit to give dated, numbered modules in program development. PRUNE old files to release space (one key DELETEs a file). Full instructions in QUILL file. Use up to 6 EXTRA MICRODRIVES (add on your Spectrum ones)!

WD Utilities for CST Q-Discs (2nd ed) **(base £8)**
As above, with extra utilities. 100-file capacity, for CST/Computamate disc systems AND upn to 4 extra microdrives. User-friendly timesavers. Update 1st ed for 25p (£1.25 outside Europe).

RefQL (5th ed) **(base £5)**
900 useful QL references in an ARCHIVE file (too long to share cartridge with other software). Also ARCHIVE 2 search program.

FOR SPECTRUM/QL/BBC/ELECTRON

WD Morse Tutor **(base £4)**
From absolute beginner to beyond RYA and Amateur Radio receiving. Adjust pitch. Set speed to your test level (4-18 wpm). Learn from single characters, via groups with wide spaces to random sentences; decrease spacing to normal. Write down what you hear, then CHECK on Screen or Printer (or speech for Spectrum with Currah Microspeech). Also own message, random figures, letters or mixed.

FOR SPECTRUM 48K

WorDfinder (microdrive/disc only) **(base £8)**
For CHEATING at crosswords. Finds M-ss--g letters, solves anagrams of shinglE words. 13,000 word vocabulary. 10-letter word ending in ATE? No problem!

Tradewind **(base £4)**
Sailing/trading strategy game with graphic surprises.

Jersey Quest **(base £4)**
Text adventure with Bergerac and the Dragon. Based on genuine folklore of the island of Jersey. (Not on SPDOS).

Prices (incl Europe postage – elsewhere add £1). Cassettes – base price only. QL or Spectrum Microdrives – £2/cartridge plus base price; 5.25" floppies £2, 3.5" floppies £4 plus base (SPDOS/Beta/OPUS discs for Spectrum). State required format when ordering. ACCESS/MasterCard welcome (over £4).

Two or more programs on one medium – pay medium + base. E.g. WD Utilities and Morse on microdrive for £11.50, but IMPOSSIBLE to mix QL/BBC/Spectrum programmes on one medium. Send YOUR cartridge and base price, but FORMAT it FIRST 6 times like us for reliability.

WDSoftware, Hilltop, St Mary, Jersey.
Tel: 0534 81392

PL480

C & F ASSOCIATES

SELECTED CHEAP TITLES FOR BBC/SPECTRUM

Title	Computer	RSP	Our Price
Ghouls	BBC	7.95	3.50
Killer Gorilla	BBC	7.95	3.50
Bumble Bee	BBC	7.95	3.50
Maziacs	Spec	6.95	3.50
Nightflite II	Spec	5.50	3.50
Invincible Island	Spec	6.50	3.50

Cheques/P.O. payable to:
C & F Associaties, P.O. Box 2, Bideford, EX39 3RE
Large SAE for latest list – All prices include VAT & P&P

PL511

HALLEY'S Comet computer Plane Tarium for the Spectrum 48K, £8.95. Anima Scientific Computing, 23 Crawley Avenue, Hebburn, Tyne & Wear, NE31 2LT

★ HUMPHREY SOFTWARE ★
presents
★ SUPER - HANDICAP ★

A unique way to help you find the best handicaped horse in any race. Many winners already this year at 20/1, 10/1, 8/1, etc. You will never need another programme to asses a horse race, also give you the class rating as well as the handicap rating.
Gives you the edge over the Bookmaker and at a give away price of only £9.95p
8 Richard Anderson Court, Monson Road London SE14 5EJ.

Spectrum Only £9.95

PL395A

BANKRUPT STOCK! GAMES FROM 99p!

A few examples:

99p	£1.49
Search of Orb (Spec)	Hellgate (C64)
Survival (Spec)	Lazerzone (C64)
Gorgan (Spec)	On Oche (Spec)
Jars (BBC)	Croakit (BBC)
Crazy Caveman (C64)	I'm in Shock (Spec)
Micromouse (C64)	

Also for Dragon, Electron, Vic 20, ZX81.
Send PO/cheque + 35p P&P or SAE for list.

ALIEN SOFTWARE (A5)
46 WATLING AVE, EDGWARE, MIDDX
01-951 4641

PL512

TIME MACHINE SAVE £££'s

Spectrum	RRP	OUR PRICE
Hypersports	7.95	6.50
Forth Protocol	12.95	10.00
Spy v Spy	9.95	6.99
Alien 8	9.95	6.99
Jet Set Willy 2	6.95	5.20
Monopoly	9.95	7.40
Cluedo	9.95	7.40
Rocky	7.95	5.90
River Raid	7.99	6.20
Roland Rat	6.90	5.25
White Lightning	14.95	10.35
Emerald Isle	6.95	5.40
Illustrator	14.95	10.45
Dun Darach	9.95	6.99
Nick Faldo's Golf	9.95	7.40
Airwolf	6.95	5.45
Hobbit	14.95	11.45
Everyone's a Wally	9.95	6.99
Entrepreneur	14.95	11.95
Starion	7.95	5.90
Space Shuttle	7.99	6.45
Battle For Midway	9.95	6.99
Herbert's Dummy Run	9.95	6.99
D. Thompson Decathlon	6.90	5.50
Matchpoint	7.95	6.50
Wordspell	7.99	6.20
Snooker	8.95	6.50
Tapper	7.95	6.40
Air Traffic Control	9.95	7.40

Commodore 64	RRP	OUR PRICE
Exploding Fist	9.95	6.99
Elite	14.95	10.80
Shadowfire	9.95	7.49
Hypersports	8.95	6.20
Nick Faldo's Golf	9.95	6.99
Spy v Spy	9.95	7.75
Cauldron	7.99	6.50
View to a Kill	10.99	7.99
Hobert's Dummy Run	9.95	7.75
Frankie G. T. Hollywood	9.99	6.99
American Road Race	9.95	7.40
Dambuster	9.95	7.40
Star Seeker	9.95	7.40
Word Power	9.95	6.99
Colossus Chess	9.95	7.95
Graham Gooch's Cricket	9.95	6.99
International Tennis	5.99	4.70
Impossible Mission	8.95	7.35
Pitstop 2	9.95	7.99
White Lightening	19.95	14.75
Entombed	9.95	6.95
Lords of Midnight	9.95	6.99
Music Studio	14.99	14.90
Jump Jet	9.95	6.99
Rocky Horror Show	8.95	6.50
Strangeloop	8.95	6.50
Gates of Dawn	8.95	6.50
On Court Tennis	10.99	8.45
Here and There Mr Men	7.95	6.45
Valhalla	14.95	11.95
Blue Max	9.95	7.99

Amstrad	RRP	OUR PRICE
Dun Darach	9.95	6.99
Exploding Fist	9.95	7.40
Beach Head	9.95	7.40
Alien 8	9.95	7.00
Knight Lore	9.95	7.00
Combat LynxElite	8.95	6.50
Snooker	8.95	7.40
Sorcery	8.95	6.50
Rocky Horror Show	8.95	6.95
Hobbit	14.95	11.45
Master of the Lamps	10.99	7.95
World Pool	8.95	6.95

BBC	RRP	OUR PRICE
Revs	14.95	11.45
Knights Lore	9.95	7.10
Lode Runner	9.95	7.40
Alien 8	9.95	7.10
Hobbit	14.95	11.45
Football Manager	7.95	5.95
Pedro Database (Disc)	34.50	19.50

ALL PRICES INCLUDE P&P overseas orders add £1.50
Please make cheques payable to Time Machine and send to

TIME MACHINE, 12 Lacy Close, Gloucester GL2 0TX Tel: 0452 424573

PL501A

SOFTWARE SALE. Hypertron £1.99, Jetload £3, 20 chr. sets £2.50, games aid £2.50 (pcw vol. 4 No. 29), Sound FX £2, speech £3, double height print £2, 64 chr/line £2, Elfindor (adv) £2.99, Lasershoot £1.99. (Send sae if you require further details), Sigmasoft, 8 Pine Dale, Rainford, Merseyside WA11 8DP (48K 5P)

- Supplied with Database containing data on over 12,000 matches since 1980!
- You update the Database each week – but no tedious typing in team and division names already in program!
- Errors easily corrected – the program even checks your entries!
- Comprehensive instruction manual and menu driven program easy to use, even for a newcomer to computing!
- Will forecast the least likely draws for those who prefer to bet on fixed odds!
- Built in perm generator – complete your coupon direct from the screen!
- Compatible with the DK'tronics speech synthesiser – the only pools prediction program to read you its predictions!
- Each copy is individually updated with all results up to the date of dispatch – no typing in enormous lists of previous matches before using the program!
- Full after sales service, including Database updates and end of season upgrades!

AMSTRA-DRAW 2 (ON DISK ONLY) £12.95
ORIGINAL AMSTRA-DRAW ON TAPE (NO SPEECH) £9.95
(Cheques/P.O.s payable to B. S. McALLEY)
AMSTRA-DRAW (Dept P), 1 Cowleaze, Chinnor, Oxford OX9 4TD
(Tel: 0844-52426)

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

TO HIRE

CBM 64 ● SPECTRUM ● VIC 20 SOFTWARE HIRE
- FREE MEMBERSHIP
- ALL TOP TITLES
- ONLY ORIGINALS USED
- PROMPT PERSONAL SERVICE

Send for your hire kit stating which machine

VIC 20 SOFTWARE HIRE (PCW)
FREEPOST
NOTTINGHAM NG1 1BR

PL412

TO HIRE A COMPUTER and/or peripherals by the week or month, please ring 01-607 0157 or 01-997 6457. We specialise in BBC and Apricot computers. Computer Hire Services, 294a Caledonian Rd, London N1 1BA.

DUPLICATION

jbs records
COMPUTER PROGRAMS

REAL-TIME or (Slow) HIGH SPEED professional Cassette Duplication and Blanks 1 to 1,000+. Computer printed cassette labels. BBC Disk copying 1 to 500+. Fast Security Delivery Service.

jbs records—a division of FILTERBOND LTD.
19 Sadlers Way, Hertford SG14 2DZ.
0992 551188

PL397

FAST reliable service of DATA DUPICATION for most computers. Comprehensive facilities include: erasure/re-recording, blank discs/cassettes, blank or printed labels/inlays. COMPETITIVE PRICE LIST from– PL395

PL395

DEALERS

DEALERS!!!
Let them know you're out there.
Call David Osen on 01-437 4343

PL497

LONDON

VIC ODDENS
6 LONDON BRIDGE WALK
LONDON SE1
Tel: 01-403 1988

PL488

ESSEX

MINNIE MICRO COMPUTER STORE
12 EASTERN ESPLANADE
SOUTHEND, ESSEX
Tel: (0702) 615809

PL483

ESTUARY PERSONAL COMPUTERS
318 CHARTWELL NORTH
VICTORIA CIRCUS SHOPPING CENTRE
SOUTHEND ON SEA
Tel: (0702) 614131

PL484

HUMBERSIDE

THE COMPUTER CENTRE
(HUMBERSIDE)
26 ANLABY ROAD
HULL
NORTH HUMBERSIDE
Tel: (0482) 26297

PL493

KENT

ANIROG COMPUTERS
29 West Hill
Dartford
Kent
Tel: (0322) 91649

PL494

D.G.H. SOFTWARE CENTRE
10 NORTH STREET
ASHFORD, KENT
Tel: (0233) 32597

PL485

MANCOMP SPECTRUM MANCOMP BBC MANCOMP

EXPRESS SPECTRUM & BBC REPAIRS!!

Repairs between £9 and £20

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

"I have come across a firm that will be more than willing to advise you as to how to remedy your problem. They are called MANCOMP, and as well as repairing faulty Spectrums, are also quite willing to discuss your problems with you, and offer reasonably cheap, and (MORE IMPORTANTLY) correct cures."
Phil Rogers 'Peek & Poke', "Popular Computing Weekly" Jan. 1985 (Vol.IV. No.1)

"My Spectrum blew recently. I took it to MANCOMP, who fixed it in 8 minutes! And for less than £10. They are local, clued up, and blindingly efficient."
Computer column, "4 Heatons Digest" (Vol.I, No.11)

"One firm, at least, can usually effect any necessary repair over the counter in 45 minutes. Based in Manchester, MANCOMP can offer what is arguably the fastest turnaround in the business, to personal callers". **"Crash Magazine", June 1985**

"Of all the repair companies *'Sinclair User'* spoke to, MANCOMP seemed the most professional when it came to advice and a helpful attitude". **August 1985**

- Send Spectrum encl. £1.80 return postage (U.K.), £2.50 (Europe), £6.50 (Middle East, Africa). • Or phone/bring Spectrum for free, no obligation estimate. • We repair most Spectrums in minutes.
- Every Spectrum sent insured and by receipted parcel post (U.K.), registered air mail if overseas. • No hidden costs.

MANCOMP LTD. (Dept P34),
Printworks Lane, Manchester M19 3JP.

Phone **061-224 1888/9888**

Open 9a.m. till 7p.m. Mon. to Sat.

We also design hardware and software from idea through to manufacture.

SPECTRUM MANCOMP BBC MANCOMP SPECTRUM MANCOMP

SPECTRUM MANCOMP BBC MANCOMP SPECTRUM MANCOMP

MANCOMP SPECTRUM MANCOMP BBC MANCOMP

BBC SPECTRUM REPAIRS

★ Spectrum repairs £18.50 inc. parts insurance and p.p.
★ BBC B repairs £18.50 + parts, insurance and p + p.

Send your computer with cheque or P.O. for £18.50 and description of fault to:

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

SCOTLAND'S No 1

For home and personal computer repairs Specially fast Spectrum service!

★ *Same day for most faults*
★ *1 hour if delivered personally*
★ *Free estimates*
★ *Upgrades, Membranes and P.S.U.'s*
★ *3 mth. warranty on work done*

Also BBC/CBM/ORIC and PERIPHERALS
Call, write or phone:

MICRO-SERV
Unit 4, Denny Workspace, Denny, Scotland FK6 6DW
(0324) 823468

Trade, schools and club discount given. PL442

Computer Repairs in Southend

Spectrum/Plus	£19.95
Spectrum K/B faults	£12.95
Interface 1/2	£14.95
New Spectrum power supply	£9.95
C64/Vic 20	from £12.95

Above prices include parts, post & packing. All repairs are guaranteed 3 months. Call in or phone for more details.

MINNIE MICRO ELECTRONICS
12 EASTERN ESPLANADE, SOUTHEND, ESSEX.
Tel: (0702) 62033/615809
OPEN 7 DAYS A WEEK PL473

CHILTERN COMPUTER SERVICE

FOR FAST RELIABLE REPAIR SERVICE

SPECTRUM £18.00

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

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

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

PL261

SINCLAIR & ACORN REPAIRS BY INTERSERVICE ELECTRONICS

With twenty one years experience in servicing all types of electronic equipment including computers for the trade (in quantities now exceeding five figures), Interservice will now accept repairs direct from the public.

Send your Spectrum, Spectrum +, ZX-81, printer, Electron or BBC together with £1.80 (to cover return) and we will send you a free estimate.

Why pay a flat rate to subsidise someone else's repair if yours only has a simple defect?

INTERSERVICE ELECTRONICS LTD
85-95 PARK STREET, SOUTHEND ON SEA
ESSEX SS0 7PX. Tel: 0702 346411 PL405

Computer Repair Centre

Have you got problems with your computer? Then call us for:
Commodore, BBC, Spectrum, Dragon

Mail order or call in
Enfield Communications
135 High Street, Ponders End, Middx
Tel: 01-805 7772 PL143

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

SPECTRUM REPAIRS

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

R. A. ELECTRONICS,
50 Kimberley Road, Lowestoft, Suffolk.
Tel: (0502) 66289 PL45

COMPUTER REPAIRS

We are the experts, having serviced Sinclair computers since the introduction of the ZX80.

Don't waste money on estimates – we repair Sinclair computers at price quoted (inclusive parts, labour, postage, VAT, irrespective of fault. No hidden charges.
Repairs guaranteed for 3 months.

Spectrum	£18.75 inc parts
ZX81	£11.50 inc parts
16 KRam	£9.95 inc parts
Microdrive	£15.95 inc parts
Interface 1-11	£18.75 inc parts
also	
BBC	£22.00 + parts
Electron	£19.95 + parts
XK Memory Expansion Kit	£15.95

Computer Retailers please phone for Special Trade Price.

Call or send with cheque or P.O.
T.V. Services of Cambridge Ltd.
French's Road, Cambridge, CB4 3NP
Tel. 0223 311371

FAST COMPUTER REPAIRS

VIDEO VAULT INTERNATIONAL 10★ REPAIR SERVICE

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

- **While you wait Service by Professional Computer Engineers.**
- **3 Months written guarantee on all repairs.**
- **International repair company.**
- **All computers sent by mail order turned around in 24 hrs.**
- **Most Spectrums repaired within 45 minutes.**
- **All Micros insured for return journey.**
- **Open 7 days a week. /Keyboard faults only £8.95**
- **School repairs undertaken-discounts available.**
- **Free software with each Spectrum repaired worth £5.95.**
- **Over 8 years experience working with computers.**

N.B. WE DO NOT CHARGE AN "AVERAGE PRICE"

ONLY GENUINE SINCLAIR PARTS USED.
Phone today for your free estimate or send your computer to us with £1.75 (UK EIRE I.O.M. C.I.) or £2.40 (Europe/Scandinavia) we will contact you the same day by phone or 1st class Mail should you require quotation first.
TRADE ENQUIRIES MOST WELCOME. ACCESS WELCOMED
VIDEO VAULT LTD THE LOGICAL CHOICE

VideoVault

Telephone: Glossop (STD 04574) 66555/67761
140 High St. West, Glossop, Derbyshire, England.

FREE GAME WORTH £5.95 WITH EACH SPECTRUM REPAIR.

Access

Book your Classified or Semi-display advert by Credit Card

Call David Osen on 01-437 4343

VISA

HA2

WANTED

SUNSHINE

is seeking authors for new titles to add to its highly original and successful book range. Experienced and first time authors are invited to submit manuscript, ideas or fields of interest. Write to: Mark Slade, Book Editor, Sunshine,12-13 Little Newport Street, London WC2H H7PP.

Sunshine Publishers of Popular Computing and Dragon User. PL31

TIPS, pokes, maps wanted on all games, for Dutch magazine. Also self-made games. First price for best entry, free weekend to Amsterdam! Computer Fun, PO box 1675, Amsterdam, Holland.

MAKE YOUR PROGRAMS MAKE MONEY!

If you have a game, utility or application to sell, with a view to publishing (particularly CBM64 or BBC B) phone **JOHN COOK at: Popular Computing Weekly on: 01-437 4343** 1548

Own Business

MAKE MONEY!

From your software but not until you read 'THE SOFTWARE SELLERS GUIDE'. It's easy to understand and comes complete with:

★ A list of reputable publishers
★ tips on selling, royalties, copyright and much more.

For your own copy send SAE with cheque/PO for £2 only (payable to Kelviz Research) KELVIZ RESEARCH, PO Box 117, K2, Coventry CV4 9WA. PL513

FOR SALE

THIS SPACE FOR SALE

£28 (inc. VAT)

TELEPHONE: *PCW* CLASSIFIED *01-437 4343 Ext 206* PL363

ACORN music 500 synthesiser, immaculate, £140. Tel Reigate 41033 evenings.

SHARP PC1211 pocket computer with printer and tape interface plus applications manual, £50. 24 Scobell Close, Pershore, Worcs (0386) 554940.

BBC B OS 1.2 Acorn DFS plus Worldwise and Disc Doctor roms; 5 and 3in drives, daisy chained colour monitor and desk all in mint condition, original bills, quick sale, £650 ono. Tel London (01) 505 0068 after 6pm.

texas t199/4A, mint condition, books, all leads, etc. Twin joysticks, cassette player, ten cartridges, ten cassettes, £65. Tel. Turvey 583.

COMMODORE 64 1541 disk drive, 1701 colour monitor, 2 joysticks, books, cartridges and over 100 disks, full of software, only £495 the lot. (05827) 69152.

CBM64 1541 disk drive CN2 cassette Simons basic, white lightning games, designer Macro assembler manuals and books, all as new, £200. Tel. Paul 01-519 4103.

COMMODORE 64, cassette unit, disk drive and over £300 worth of software including top games, programming aids, easyscript, also £50 worth of manuals, quick sale needed, hence only £99. Dave, 01-894 6875 evenings.

THE AMSTRAD CPC464 plus monitor, also colour modulator, £100 software including Knight Lore Alien 8 Combat Lynx, all mint condition, only two months old, year's guarantee, only £220 ono.

FOR BBC 3" d/s disc drive etc £95, Latest LVL DDOS £45. Prism 1000 Modem £45. 061 962 4395 (Manchester).

Computer Swap

Acorns for Sale

BBC B without DFS Acorn data recorder, pair BBC joysticks, £217 or software inc revs and elite, £36 of books. Total cost £714, want £290 ovno. Tel: 698 2790 between 6-7pm. Ask for Gary.

BBC MICRO WITH OPUS 40 track disc drive, 2 joysticks and 40 discs, with games all six months old, £350 ono. Write D. Scott, 26d, Harden Place, Hawick, Roxburgh, Scotland TD9 7BY.

BBC SOFTWARE including Elite, Revs, Castle Quest, Atic Atac and many others. All originals. Tel: 0732 846751 after 8pm.

32K BBC 1.2 O/S full upgraded, cassette, joysticks, software, books (including assembly language programming on BBC micro, also 20 Beebugs), magazines. Value over £600, offers £210 now! Tel: 061-439 4690 (evenings).

BBC B, Acorn DFS, disc doctor, 32K Ram card, AMX mouse, joystick interface lots of software and all issues of Acorn and Micro User. Plus reference books and manuals, excellent condition, £375 ono. Clive. Tel Ruislip 30965.

BBC MODEL B Acorn DFS, Wordwise, loads of disc software, both user guides, many magazines, £325. Tandon 100k full height drive £75. 14" RGB colour monitor, £130. Tel: 0980 24284 evenings.

ACORN Electron, recorder, joystick and interface, some books and magazines, and lots of software, all as new, and boxed, £120. Tel: Radstock (0761) 35401.

Ataris for Sale

ATARI 822 Printer + paper, manual, etc £65 ono. Touch Tablet £25. Text Wizard, not XL, £20. Paint 48K disk £10. Pilot cartridge £15. Atari World 48K Disk £15. Tel: 01-540 0527, after 6pm. All vgc.

Commodores for Sale

SWAP CBM64 software, worth £180, including Hyper sports, exploding fist, international football, basketball, tennis, rocketball pole position and more plus 22in colour TV for a working 1541 disk drive. Tel: Hull (0482) 645724.

C64 disc drive, word processor, various bits. £250. Tel: Billercay 3483.

COMPLETE CBM 64 system for sale, disc drive, printer, paper, and s/w. £450 ono. Tel: 0342 315257.

CBM plus 4, data recorder £60. Under guarantee, 3 months old. Tel: 01-953 5565.

CBM 64 + C2N data recorder, joystick, £130 of original s/w + books inc Superbase 6 reference guide £200 ono. Tel: 01-391 2238 (Chessington).

COMMODORE 64 disk drive, MPS printer modem. Swap for Spectrum + microdrive printer arc, sell for £350. Tel: Evesham 48781 after 6pm.

CBM 1541 DISC DRIVE FOR SALE includes easy script blank, discs, games, £150. Also for sale software on tape and disc Beach Head, Zaxxon, Sublogic Flight Simulator, stack compiler, also books. Colin. Tel: 0438 356489.

Dragon

DRAGON 32 plus 25 new games inc Jet Set Willy. Also several other games and magazines, books all leads etc, all for £130. Tel: 9 60769.

DRAGON 64, 10 games, two joysticks, cassette recorder and manuals, £180 ono. Tel: Bourne (0778) 424023.

Spectrums for Sale

SPECTRUM 48K, Interface 1, microdrive, ZX printer, RS232, in-out port, progammable joystick interface, books and lots of software. £225 ono. Tel: Ashford 47508 evenings (Middx).

SPECTRUM 48K. 11 months old, over 130 programs, tape recorder sound amplifier, joystick interface, joystick, £100 for quick sale, or swap for Commodore disk drive or monitor. Tel: Loughborough 231018.

48K SPECTRUM INTERFACE 1 MICRODRIVE, 5 cartridges, ZX printer and paper, carrying case, manuals, some software and magazines, excellent condition. £160. Tel: 01-859 0170.

48K SPECTRUM, boxed, over £300 orig s/w, plus 100s mags, books, leads, manuals. A snip at £185 ono. Tel: Barney Ashford, Middx 44640.

48K SPECTRUM and ZX printer £75. Hisoft Pascal £7.50, Devpac £5. Picturesque Assembler/Monitor £4. Complete Rom Dissembly (Logan) £3. Tel: 021 354 6698. Free delivery within greater Midlands.

For Sale

INTERFACE 1 plus 2 microdrives and 9 cartridges. Boxed withmanual. Excellent condition. Also DK'Tronics light pen. The lot, £90. Tel: Irvine (0294) 72245.

SINCLAIR QL SOFTWARE, Micro Deal, Lands of Havoc, Graphic adventure with 2,000 different screens, as new, cost £19, your for £14. Tel: 0635 200369 after 6pm.

AMSTRAD CPC 464 COLOUR – including joystick and over £180 worth of software. Books. Still under guarantee. Excellent condition. Steve. Tel: 01-992 7187 after 6pm.

TRS-80 MODEL I, LEVEL II, 48k, green screen monitor, expansion interface, double density, double disc drives, Visicalc, Newdos 80, LDOS, games, magazines, cost £1,000 + sell £450. Reid. Tel: Medway (0634) 387012 after 7pm.

CPC464 (GREEN), firmware guide, program book. £100 worth of software including sorcery, Knight Lore, Ghostbusters, Amskey, Mini-office m/c tutor, Codename mat, Manic Miner and more only £200. Tel: Thanet 597659.

SINCLAIR QL (JM ROM), V2 Psion software, Psion chess, Centronics interface, RS232 lead, £200. Cub med monitor, £180. Smith Corona TP1 printer, £70. Tel: 01-366 1706 after 6pm.

TATUNG EINSTEIN DUAL DISK DRIVE, monitor, joystick, software, manuals, almost new, £350 ono. Dave. Tel: 01-806 9383 eves or weekend.

SPECTRUM ORIGINALS: Spy vs Spy, £5; Shadowfire, £5; Cauldron, £4; Dundarach, £5; Spyhunter, £4; Squash, £4; Starion, £4; Chuckie 2, £4; JSW II, £4; Gremlins, £5; Bloodaxe, £4; Tapper, £4, etc. Tel: 01-674 3270 eves.

AMSTRAD CPL 464 with colour monitor. 12 months old. DKTronic speech synthesiser, joystick, £300 of S/W. £399. Tel: 01-861 4643 any time. Ask for Paul.

SINCLAIR QL Miracle systems Centronics printer, interface, books, magazines, extra cartridges, £210 ono. Steve. Tel: 0803 213862 after 7pm.

AMSTRAD CP464, colour monitor, serial and disc drive/interface. Firmware manual, plus software: Sorcery, Fighter Pilot, Tasword and many Amsoft. Very quick sale, £350 ono. Perry Tel: Tilbury 03752 5834.

AMSTRAD CPC464 + software pack, 4 months old, £250 ono. Tel: 021 354 6898, free delivery within Greater Midlands.

FOR SALE Ferguson data recorder, £20. Datel Switchable Interface plus Voltface joystick £17.50. Six 5.5in disks £25. Tel: 041 357 0262, after 7pm.

COLOUR MONITOR 4½in Toshiba C-500 with Palb VHF/UHF tuner, composite video/audio inputs, suits computer/video professionals, worth £350, bargain £200. SAE to C. Maarof, 54 Woodlands Road, Crumpsall, Manchester M8 7NF.

SINCLAIR QL. Assembler, Sprite Designer, M/C tutor, games, perfect condition, boxed, no longer needed, so £299 ono. Michael Fox, Aldridge (0922) 52230 anytime.

DIABLO Daisywheel Hytype II 1345 printer, 45 CPS £280 ono. Hazeltine VDU, needs slight attention, £50. Two Persci 8in dual drives, good condition £60 each. Tel: 427 4949 evenings.

AMSTRAD CPC464, green screen, £130 + software, manual plus mags. All excellent condition, can deliver within 50 mile radius, £165 for quick sale. MP-1 Modulator £15. Tel: Oxford (0865) 245757.

MICROLYTE 80 dot matrix printer, Centronics parallel port, Epson compatible, graphics, Italics, Condensed, Emphasised modes, suitable for use with most computers, traction and friction paper handling, £135. As new. Tel: 01-689 0531 (Croydon).

AMSTRAD CPC464, Green Screen, Quickshot 2 joystick, six months old, 12 games inc Sorcery, Knightlore and others, £200 ono. Tel: Kings Langley 62489.

AMSTRAD CPC464, including green screen monitor and manual. Only 5 months old. All as new and under guarantee £180. Also Seikosha GP500A printer. Excellent condition £95. Tel: 01-648 9670.

SEIKOSHA GP 250 printer complete with cable, excellent condition £150 ono. Tel: Chipping Sodbury 322138 after 6pm.

AMSTRAD free software pack £5. Also a 3D maze game for only £1.50. M. Merritt, 12 Greenfields, Sutton, Nr Pulborough, Sussex RH20 1PP.

AMSTRAD CPC 464, plus colour monitor, all boxed, Quickshot II joystick and dust cover, games, mags. The lot £320 ovno. Tel: 0480 73332.

48K SPECTRUM, interface 1, microdrive, tape recorder, keyboard and workstation, some software, virtually unused £175 the lot. Buyer collects. Tel: 0225 706797 weekends only.

CBM 64 C2N cassette printer, Simons basic speech synth, books, magazines £300 software (all original) worth £850 accept £425 ono. Tel: Aldershot 25067 after 5pm.

Wanted

ANYONE got a CBS Colecovision 'Turbo' steering console they want rid of? I'll take it in any condition, working or not. Phone me (Rico) at Johnstone 24078.

WANTED Atari 400 in good condition with power supply. Will pay £25 for 16K. £35 for 48K. No software required. A Hughes, Twin Oaks, Oak Farm Lane, Fairseat, Sevenoaks, Kent TN15 7JU.

WANTED WORKING SPECTRUM OR CBM 64. Will pay up to £50 or £80 respectively. Also Lynk 48K software (utilities preferred). Please send details on postcard. Dilip Hirani 58 Honeywell Lane, Oldham, Lancs OL8 2AA.

WANTED Summer Games disk for CBM64, must be original and in box, will pay £10. Tel: 01-673 5819 after 6pm. Also, swap Beach Head 2 and Exploding Fist cassettes for disk versions plus £3 each to make up difference.

WANTED Oki Microline 82a or 92a printer with tractor feed (if possible) and manual. Tel: 0480 73332 with details.

QL Centronics printer interface by Miracle Systems. New and boxed only. £25 ono. Tel: Portsmouth (0705) 824309.

SWAP Boxed ZX printer with manual + paper, for ZX Microdrive, boxed with at least introduction cartridge, or Interface II with at least 3 Roms. Write: Rob, Lower Leeze, Gulworthy, Nr Tavistock, Devon BL19 8JA.

WANTED CBM64 and cassette recorder. Will pay £100. Pleast contact M. Keeves, 37 Greenwood Ave, A'Cocks Green, Birmingham B27 7QH.

WANTED Data Recorder suitable for Commodore C16 or Plus 4. Tel: Blyth (North'land) 0670 356601.

WANTED Any small computer to learn basic on. Will offer 2 radio controlled model cars (value £50) as exchange. Tel: 0244 675717.

WANTED Oric 1 48K or Atmos in good working order. Also good database and word processor and other software/peripherals. Send details to: David Oya, 24 Kingsway, Banbury, Oxon OX16 9NY.

WANTED powerpack and all leads for Texas TI99/4A also wanted Spectrum or CBM64 to swap for Racing Cycle, vgc.

WANT good ZX Printer plus paper to swap my good working Comcon Programmable Interface with its matching two fire button joystick. 54 Park House, 314 Seven Sisters Rd, London N4 2LS.

WANTED pocket computer (any type) with 16 line by 1 character display (LCD) working. Tel: Oxford 881617.

SINCLAIR QL Software and books wanted. QL penpals wanted (any country) to swap ideas, programs, etc. Write to N. Kennett, Micklefield Lane, Rawdon, Leeds, LS19 6BA.

WANTED Atari disc drive, will pay up to £100 + Atari touch tablet. Tel: (York) 25016.

SPECTRUM 48K, Kempston I/F, Alphacom 32 printer, plus books + S/W. Swap for CBM64 with data recorder + cash adjustment. Tel: Runfold 2966, eves.

C16 Owners. Wanted Pen Pal! Tel: 0290 25305.

SWAP photographic equipment for CBM64 computer. Tel: 01-603 3137, eves.

SWAP Vic 20 computer for Musical Keyboard + cash. Tel: 01-574 0450.

SPECTRUM 48K plus tape recorder and S/W. Swap for CBM64 with tape recorder. Tel: Fred 01-727 7624.

SWAP Commodore 64 with 1525 printer and C2N cassette recorder. For BBC B with accessories. DFS if possible. Tel: 0922 75657.

WANTED Commodore 64, disc drive, for Akai video, 5 months old. Tel: 021 5239 009, Mark.

WANTED Currah Micro slot or equivalent must be in good condition and working order. Tel: 0763 61392 and ask for Viv.

WANTED 1541 disc drive for use with CBM 64. Tel 0900 2130.

SWAP Amstrad CPC464 green screen monitor, joystick and games. Swap for any 125cc or 100cc motor bike or sell for £220 ono.

SWAP TI 99/4A solid state command module and cassette. 'Tunnels of Doom, Quest of the King' boxed with guide book for QL. Psion update Easel etc or Chess.

WANT to swap your BBC software? Then don't delay, write today! Send your list to Miss A. Dence, 8 Beare CLose, Hooe, Plymouth PL9 9RT. Also £10 paid for revs on disc.

WANTED green CPC464. Leeds area 551865.

WANTED back issues Antic, Analog, page 6 and monitor magazines. Also Atari 850 Interface, 800XL and 1050 disc drive. Tel Mike 0793 39105 evenings.

SWAP Scalextric 400 set worth £35 for a Currah micro speech unit for ZX Spectrum. Tel: 0371 2031.

SWAP CBM 64, disk drive, recorder software for Amstrad CPC464. Sell for £270 (2 months old). Sell printer £95 or swap Amstrad disk drive or large screen colour TV. Tel: 0904 707699.

SWAP Currah microspeech plus Ferguson datacorder plus Tasword 2 plus Superlode 2 plus Mett plus £100 worth mags for Prism VTX 5000 or sell £50. Tel: 0246 206447.

I WOULD like to hear from anyone who is willing to sell their chess rom cartridge for the Atari home computer. Tel: Brian on Portsmouth (0705) 263948 anytime.

WANTED Amstrad CPC64 colour will swap 48K Spectrum, Speech, light pen, joystick interface and tape recorder. Tel: Ath 884558.

SWAP BBC B + Cassette + joysticks + S/W graphics Rom + Speech Synth for CBM64 + Disc Drive + tape deck + S/W. Paul Chapman, 29 Warwick Close, Catterick Garrison, North Yorks.

WANTED Alphacom 32 printer for spectrum, not more than £25. Reason Pensioner. Tel: 01-267 3696.

SWAP Word Processor tape or disk, for CBM 4032 & 2031 or 8250 for other business progs, tape or disk for 4032 etc, or what have you. Tel: 0202 26110.

WANTED urgently, Oric Atmos manual, will pay £5. Contact John on Witney 2557 (day) or Ramsden 249 (evening).

SWAP £800 worth of Spectrum in Lo Profile k/board. List very large. For BBC B bits 'n' pieces or Electron outift. Write Mr Elvin, 214 Horninglow Rd, Firth Park, Sheffield S5 6SG.

WANTED Disc Drive for Oric Atmos, must have all leads and any books. Any other hardware, software. Tel: John 0482 857345, after 6pm.

WANTED cheap computer, ie Jupiter Ace, Sord, 16K Oric 1, 16K Lynx(?) or others plus Ram pack for ZX81 or ZX80. Tel: Toby on 02814 2450 (working only).

WANTED: CBM64 software to buy. Must be cheap. List and prices to Mike, 86 Leicester Rd, Quorn, Leics.

SELMER Electric piano swap for Commodore 64. Contact 01-595 9300, George.

SWAP CBM64 plus C2N recorder, joystick, books, £300 s/w, swap for QL or reasonable offer. Tel: 01-695 0722.

WANTED DRagon, will swap Jupiter Ace + some games. Tel: West Lothian 823617.

SWAP Spectrum Plus + games + joystick interface + mags + books. Still under guarantee plus CGL/M5 computer + manuals both boxed for CBM64 + C2N or sell £160. Write with phone number, Gary Sanger, 30 Station Ave, Wickford, Essex SS11 7US.

SWAP Casio PT50 programmable keyboard, inc Rom + books. Still in box, cost £95. For Atmos in working order. Tel: Brighton 0273 592774, eves.

CAN Anybody sell me a Sinclair Spectrum microdrive and interface I? I wil pay £40 max. Must be in Bristol area. Tel: Winterbourne 778277. Please reply quickly.

WANTED CBM 1541 disk drive. Will swap for Spectrum 48K with DKTronics keyboard and joystick interface and joystick. Ask for Kerry. Tel: 0832 73795, after 4.50pm.

WANTED CBM64 pen pal to exchange ideas, software, etc. Write to L. J. Woodford, 16 Wellspring Tce, Pontymister, Gwent NP1 6BE.

SWAP original ZX Spectrum keyboard + dustcover + £20 for ZX printer or Alphacom 32 printer. Tel: 907 1204, ask for Douglas (Harrow area).

SWAP Electron inc Elite & five games, books, for 22-26 colour TV or sell £90. Swap CBM printer for TV or 1701 monitor or VHS recorder or £95. Tel: 0904 707699.

BROTHER HR5 printer for Sinclair QL, cable provided, 6 months old, cost £175 sell £90. Tel: Stone 817591.

VIDEO Swap NEC744E video recorder, excellent condition, cost £300 for a printelr or an Amstrad disc drive. Tel: 01-992 7187, after 6pm.

WANTED Monty is Innocent, will swap for 3D Star Strike, also swap Night Gunner for Trashman or Travel With Trashman. Tel 09853 442 (Maiden Bradley).

WANTED Alphacom 32 printer. Will pay up to £25. Tel: 021 742 3840.

SWAP My Joe Waugh custom racing cycle worth £600 for a BBC B 1.2 OS + DFS + Disk Drive, fair to excellent condition considered. Tel: 0670 813087, after 4pm.

WANTED QL listp, QL Super Sprite Generator, QL Monitor, Integrated Accounts, Metacomco Pascal for sale Pascal. Tel: 021 742 1969.

WANTED Commodore 64 + Cass + S/W? Offer Ham International AM-FM-USB-LSB, low-mid-high frequencies plus lots of extras. Tel: 735 3952 for info 12-1.00 weekdays only.

WANTED Schematic/circuit diagram for an Atari 800XL not old Atari, need for own personal use, cash waiting. Tel: Basildon (0268) 284771 evenings.

WANTED ZX80, ZX81 or Jupiter Ace, must be in perfect working order with all leads. Up to £15 paid. Tel: 353 21 334270, after 5pm.

SWAP Turboprint printer interface (interface most Centronics printers to Commodore 64 with Commodore graphics) for MPS801 printer. Tel: 0248 353346.

WANTED CBM 1541 disc drive, all offers considered. Tel: 01-435 9707.

WANTED ZX80 or Jupiter Ace. Willing to pay £10. Also wanted crash issue 1. Phone 0342 713422 evenings only.

WANTED to buy Jupiter Ace computer. Tel: Peterboro' 0733 234407.

WANTED Modem and teletext adaptor for Spectrum, also Sinclair Logo. Tel: 01-683 1039, after 6pm.

WANTED Working or not. CBM 4023 'friction' feed printer for conversion. Must be friction feed. Come on you guys. Where have they all gone? Fair price paid. Tel: 0244 660677.

WANTED 'Interpod' interface to connect CBM 64 to CBM dual disc drive, ie,serial to IEEE 488. Firm has gone bust. Has anyone got one? Tel: Bill on 0244 660677.

SWAP BBC B with s/w books all cables for extensive Spectrum outfit, interface, modem, discs, or micros, printer, etc. All letters answered. Mr H R Elvin, 214 Morninglow Road, Firth Park, Sheffield S5 6SG.

WANTED Com-com joystick interface, will pay £10 ono. For sale approx 100 assorted computer mags. Cost £60 sell for £8 ono or swap for Com-com interface. Tel: (04747) 3530 (ask for Graham).

SWAP Dragon 32 +, software and joystick, books and magazines + CB with antenna for Spectrum 48K, or sell for £90. Tel: 0783 294020.

WANTED Spectrum keyboard, eg, LMT, Lo-Profile, Saga, Dktronics, Stonechip. Pay £20-£#25 or swap for ZX81 + power pack, manual, software etc. or light pen + Automata 10 pack + Megabasic with manual + Twin Kingdom Valley + Electronic Intercept. Tel: (Graham) 04747 3530.

ACORN PLUS 3 disc drive for sale or swap. Open to offers. As new condition. Tel: Simon 051 722 5962 after 6pm.

ARE THERE keys on your Spectrum which are worn out? Then buy my brand new Spectrum case for only £8. Tel: 370 0749.

WANTED Memotech RS232 interface for Z81. £25 offered. Would consider Maplin RS232. Tel: Worcester 351617.

AMSTRAD PEN PAL wanted. Write to Shane Kay, 4 Acklington Drive, Colindale, London NW9 5WL.

SWAP two month old Prism Modem 1000, OEL Communication Cartridge + Micronet software for 1541 disd drive. Tel: Elgin 44735.

COMPUTER SWAP

Computer Swap entries are limited to 30 words. All entries cost £2.50 and can be accepted in writing only. Please enclose a cheque or postal order or give Access or Barclaycard No in the box provided. Only text appearing in the grid will be printed. Send the form to: Computer Swap, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP.

All software offered through computer swap must be in original condition and for private sale only.

It cannot be swapped.

Warning: It is illegal to advertise pirated software.

COMPUTER SWAP

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

Name .....

Address .....

..... **Telephone** .....

☐ *Please charge my Visa/Access card no:*

DIARY

Event	Dates	Venue	Admission	Organisers
Computer Show	August 31 10.30am-8.00pm	Co-op Hall East Street Swindon Wiltshire	50p	CJS/Northleach 04516 609
Personal Computer World Show	September 4-8	Olympia London	£2.00	Montbuild 01-486 1951
Electron and BBC Micro User Show	September 27-28 10.00am-6.00pm September 29 10.00am-4.00pm	UMIST Manchester	£2.00 adults £1.50 children	Database Publications 061-456 8383
Amstrad User Exhibition	October 5-6 10.00am-6.00pm	Novotel Hammersmith	£2.00 adults £1.00 children (in advance)	Computer Marketplace 01-930 1612

WANTED Atari 810 disc drive with some software will pay up to £100. Tel: Penzance 69838 between 6-7pm.

SWAP my Acorn Electron with software, books and Electron Users for your Spectrum Plus or even a Commodore 64. Anybody! Tel: Derek, South Shields 551480. We love Jack Tramiel!!!!!!!!

SWAP QL ZKUL or Typing Tutor for DP Sprite generator or Zapper or Archiver or Backgammon or any good football pools prog. Tel: Adrian on 0934 697095.

AMSTRAD pen pal wanted home or abroad to swap ideas and tips. Write to N. Hadi, 80 York Rd, Montpelier, Bristol BS6 5QF.

EXCHANGE Korg SAS 20 keyboard, stand, cartridges etc. Cost £600. Wanted BBC system or WHY? 01-908 1460.

BROTHER HR-5 boxed with paper and ribbons, Centronics interface, under guarantee. Will accept first offer of £120. G. Pegler, The Cricketers, East End Road, Bradwell on Sea, Southminster, Essex CM0 7PT.

WANTED for Oric Atmos 48K. 1) Oric Microdisc system. 2) Oric or compatible modem for Prestel and bulletin board use. Call Ian on Rugby 2062 with details.

SWAP Seikosha 700-a colour printer for bi-directional NLQ matrix printer with Centronics and serial ports. Immaculate condition. Tel: Lowestoft 0502 516625. Or sell £220.

SWAP DKtronics speech for Amstrad computer for Pascal and an assembler monitor for Amstrad. Tel: Mansfield 556823.

SWAP electric bass guitar (three months old) for 16K memory expansion and printer for a Vic 20. Tel: Roy, Swanley 66485.

SPECTRUM DKtronics keyboard. Joystick, 10 games, books, tape recorder. Swap for Amstrad, Commodore with cash adjustment or 140 pound notes. Farnborough 57134 (Kent).

WANTED Amstrad CPC 664 colour. Will exchange with colour CPC 464 and £130 negotiable. Includes many games, books, magazines, joystick (Quickshot), Tasword, Deupac, Knightlore etc. M. Syn, 6 Ibis Lane, Chiswick W4 3UP. 01-995 9522.

WANTED ZX81, no leads, power supply, manual. Good condition. Will pay £20. Write Jim, Mpore, Delphi, Greece, GR 33054.

WANTED Jupiter Ace and software, no leads etc. Good condition. Will pay £40. Please write to: Jim, Mpore, Delphi, Greece, GR 33054.

STUDENT would like your old neglected computer. Please write giving details and cost to Dilip Hirani, 58 Honeywell Lane, Oldham, Lancs OL8 2AA.

WANTED Someone with whom to exchange ideas and hardware for the Amstrad computer cassette computer only. Tel: Mansfield 556823 (Colin) anytime.

WANTED Sharp MZ80K, 48K with disc drive + printer (optional). Contact 06065 51461 ask for Mr Pearson.

WANTED Interface I may consider one with microdrive or with non-working microdrive must be very reasonable due to limited amount of cash or swap and cash. Tel: 0843 68522 evenings.

JUPITER ACE wanted complete with leads, manual and 16K ram pack. Contact Cpl. Fahey, MDSS TPMH, RAF Akrotiri, BFPO 57.

Amstrad for Sale

AMSTRAD disc drive + interface + system disc, as new £150 ono. Also Amstrad software. Tel: 0745 32668.

COLOUR AMSTRAD perfect condition, boxed, as new, still under guarantee. Including joystick and £400 software: Sorcery, Alien 8, Combat Lynx, Pyjamarama, Ghostbusters, Rollaball, etc. + mags. Only £330 ono. Tel: Halifax 41074.

AMSTRAD CPC 464, colour monitor. 8 mths old, perfect condition. Want to upgrade to CPC 664 so £230 (no offers). Tel: (0282) 67418 anytime.

AMSTRAD CPC 464, colour monitor, 3" disc drive, Seikosha GP 80A printer, Protek modem + interface. Over 170 programs, 80% on disc, joystick. Only £750. Tel: 0555 72175 ask for David.

AMSTRAD CPC 464 with colour monitor and manual. Various software. Hardly used. Still boxed. Forced to sell so only £240. 01-737 4169.

AMSTRAD CPC 664 with software and discs worth over £500 plus Spectrum 48K, keyboard, synthesiser, joystick, interface II, over £200 software, books and magazines. The lot £500, will split. Tel: John 01-534 3805.

AMSTRAD 464, green screen, joystick, £150 software. £180. Disc drive + interface 1 + 2 discs £155. Tel: 01-337 4595.

AMSTRAD CPC 464, complete system computer colour monitor, disc drive, speech synthesiser, light pen, maxam rom, dust covers, books, mags + software, value £870 sell for £479. Tel: 01-743 3937.

AMSTRAD disc drive twelve weeks old, hardly used, complete with three blank discs, boxed. £129. Also Amstrad software. £3.50 each. Tel: 0630 57129.

AMSTRAD 464 and colour monitor, Quickshot II Centronics lead, headphones, software, book on Z80, manual etc. etc. In original boxes and good condition. Bargain at £400 ono. Tel: Halesworth 2689.

AMSTRAD CPC 464 (green) firmware guide, programs book plus over £95 worth of software including Sorcery; Knightlore; Ghostbusters; Amskey; M/c Tutor; Mini-Office. All perfect. Only £215. Thanet 597659 eves.

AMSTRAD complete system, colour CPC 464, disc drive, Seikosha printer, 200 programs, 130 on disc, DKtronics light pen, Protek modem + interface, joystick, books, club, printer paper, ribbons. Only £599. Tel: 0555 72175 David.

ZX81s for Sale

ZX81 Ram pack, £200 of s/w, books, £40. Tel: 01-904 1392 (Alex) after 6pm.

ZX81 64K graphics Rom, DK Tronics keyboard, s/w + BRS with split, no offers refused. Tel: 0452 720080.

ZX81 1K for sale, including all leads, power pack, manual etc., boxed plus basic book, price £12 ono. Tel: 01-858 7420 weekends anytime or weekdays after 5pm.

TWO BROKEN 16K Ram packs for ZX81, perfect condition except connections to computer, need slight attention. Ideal for spares, repairs etc, £3 each, £5 the two. Tel: 01-858 7420 after 5pm.

FORTH COMPUTER Sinclair ZX81 fitted with Forth Rom (by David Husband), Memopak 16K RAM and Filesity rubber keyboard. ZX81 ROM also supplied. £45. Tel: Hemel Hempstead (0442) 60516.

BEATEN UP ZX81 in butchered DK Tronics case, still works. Plus Sinclair 16K and Memotech 64K Rampacks, software too! Buyer collects, reasonable offers: John Schofield, Blackburn (0254) 60033 (Day) 28127 (Night).

16K ZX81, as new, with File Sixty keyboard, AGF programmable joystick interface, learning Lab and many listings, worth £100 sell for £50. Tel: 0424 440641.

ADVENTURE HELPLINE

Claymorgue Castle on C16. How do you get from the loft to the battlements? Cameron MacKintosh, 38 Windsor Place, Conon Bridge, Rossshire IV7 8BX.

Zim Sala Bim on Commodore 64. Stuck in dungeon. Mrs J. Hammond, 4 Maidstone Avenue, Romford, Essex.

Williamsburg on C16. I can't get started. S. Rafferty, Hayes playing Fields, Redditch Road, Kings Norton, Birmingham B38 8LP.

The Island on Spectrum. How to pass lion and light dynamite? John Forder, 21 Orchard Croft, Harlow, Essex CM20 3BB.

System 15000 on Commodore 64. What is the code for a Rouledge and Co., and the Bank Apter MMB FR. Bradford Parker, 3 Thistlewood Crescent, New Addington, Croydon, Surrey.

Sherlock on Spectrum. I can't prove Major Foulkes innocent. Any other help appreciated. Greg Taylor, 32 Linton Avenue, Bury, Lancashire.

Wizard of Ahynd on Spectrum. I've got the princess and the two treasures, but can't get back to the castle! Carsen Meiselbach, Hombergerstrasse 119A, D-4730, Moers 1, West Germany.

Bored of the Rings on Spectrum. I can't get out of the Barrow. I have the magic beans, ale. Peter Martin, 16 Mich Karaolis Street, Strovolos, Nicosia, Cyprus.

Sphinx on Electron. What do you burn to get out of the serpant, and how do you get past the ogre. P. Harper, Old Blacksmith's Shop, Berrow Green, Martley, Worcestershire.

Perseus and Andromea on BBC B. Any help please . . . I'm stuck . . can't seem to get anywhere. R. Dawson, 41 Union Ct., Otley, W. Yorkshire.

Sherlock on Spectrum. How do I get to the scene of the crime? Scott Nelson, 60 Wood Crescent, Motherwell, Lanarkshire, Scotland.

Philosophers Quest on BBC B. Any help appreciated, as I can only score 16! G. Ashton, La Sommezlleuse, Rue des Cambrees, Rocquaine, St. Peters, Guernsey.

Artic Adventures on Spectrum. I've finished all seven Artic Adventures, so if you need any help, send an sae and I will reply. Adrian Bold, 19 Towersey Drive, Thame, Oxon, OX9 3NR.

System 1500 on Spectrum. Don't know how to use Selcra – have access code but cannot use. Rob Sexton, 122 Heol Lewis, Rhiwbina, Cardiff.

Valkyrie 17 on Spectrum. How do I get out of the hotel. Andrew Rae, 116a Kingsmead Avenue, Worcester Park, Surrey.

Pub Quest on C64. I can't cross the road. How do I open the cabinet in the loo? Ian Hunter, 26a Buxton Road, Walthamstow.

Return to Eden on BBC. At the beginning, I keep getting blasted – help please. Mark James, 26 Whitecote Cottages, Whitecote Lane, Bramley, Lancashire.

Arrow of Death Two on BBC. I can't seem to get started. R. Dawson, 41 Union Court, Otley, West Yorkshire LS21 3AS.

The Fourth Protocol on Spectrum. How do you cure Thorn and what do you type in at medical security? Paul Jones, 6 Primrose Way, Wrexham, Clwyd LL11 2AT.

Fantasia Diamond on Enterprise. How to cross the river or open the manhole. Peter Mundin, 17 Coronation Avenue, Mile Oak, Nr. Tamworth, Staffs B78 3NN.

The Hobbit on C64. How do you get out of the Elf King's dungeon and through the trap door and portcullis. Shaun Brogan, 42 Castle Way, French Street, Southampton.

Spiderman on Spectrum. How do I get to Mysterio? How do I beat Electro? Where do I get paper to run presses? G. Bird, 35 Wolseley Street, Newport, Gwent NP9 2HP.

Catacombs on C64. How to get through the door at the beginning to enter the catacombs. A. Conway, I Dudley Road, Walton-on-Thames, Surrey KT12 2JT.

Doomdark's Revenge on Spectrum. Has anybody got a better map than the one on the booklet? James Haslam, 6 Sittingbourne Avenue, Bush Hill Park, Enfield, Middlesex EN1 2DA.

Hobbit on Amstrad. How do I escape from the Goblin's Dungeon and how do I answer Gollum. Stephen Miller, Oakdene, Old Station Road, Halesworth, Suffolk IP29 8JJ.

Sherlock on Spectrum. Have solved the crimes but can't get any further. Mike Shepherd, 10 Linksfield Road, Aberdeen.

Charts

Amstrad

1	(1)	Way of the Exploding Fist	(Melbourne House)	£9.95
2	(–)	Daley Thompson's Decathlon	(Ocean)	£9.95
3	(4)	Beach-head	(Access/US Gold)	£9.95
4	(–)	Chiller	(Mastertronic)	£1.99
5	(–)	Finders Keepers	(Mastertronic)	£1.99
6	(–)	Nonterraqueous	(Mastertronic)	£1.99
7	(–)	Airwolf	(Elite)	£8.95
8	(–)	Locomotion	(Mastertronic)	£1.99
9	(3)	Dun Darach	(Gargoyle)	£9.95
10	(–)	Ghostbusters	(Activision)	£9.95

Atari

1	(2)	Mig-Alley Ace	(Microprose/US Gold)	£9.95
2	(1)	Bounty Bob Strikes Back	(US Gold)	£9.95
3	(–)	Red Moon	(Level 9)	£9.95
4	(–)	Archon	(Ariolasoft)	£11.99
5	(–)	Beach-head	(US Gold)	£9.95
6	(–)	Pole Position	(US Gold)	£9.95
7	(4)	Airwolf	(Elite)	£8.95
8	(5)	Drop Zone	(Microprose/US Gold)	£9.95
9	(–)	Strip Poker	(Knightsoft)	£8.95
10	(–)	Leggit	(Imagine)	£6.95

BBC

1	(2)	Revs	(Acornsoft)	£14.95
2	(1)	Beach-head	(Access/US Gold)	£9.95
3	(6)	Elite	(Acornsoft)	£12.95
4	(4)	Alien 8	(Ultimate)	£9.95
5	(–)	Mini Office	(Database)	£5.99
6	(10)	Knightlore	(Ultimate)	£9.95
7	(–)	Combat Lynx	(Durrell)	£8.95
8	(–)	Brian Jacks Superstars Challenge	(Martech)	£8.95
9	(–)	Magic Mushrooms	(Acornsoft)	£9.95
10	(–)	Gremlins	(Adventure International)	£9.95

Commodore 64

1	(1)	Way of the Exploding Fist	(Melbourne House)	£9.95
2	(–)	Beach-head II	(Access/US Gold)	£9.95
3	(2)	Frankie Goes to Hollywood	(Ocean)	£9.95
4	(3)	Hypersports	(Imagine)	£7.95
5	(–)	Action Biker	(Mastertronic)	£1.99
6	(–)	Kick Start	(Mastertronic)	£1.99
7	(10)	Soft Aid	(Various Artists)	£4.99
8	(–)	Dambusters	(Sydney/US Gold)	£9.95
9	(4)	Elite	(Firebird/Acornsoft)	£14.95
10	(–)	International Tennis	(Commodore)	£5.99

Spectrum

1	(1)	Frank Bruno's Boxing	(Elite)	£6.95
2	(2)	Hypersports	(Imagine)	£7.95
3	(4)	Frankie Goes to Hollywood	(Ocean)	£9.95
4	(9)	Dambusters	(Sydney/US Gold)	£9.95
5	(–)	Action Biker	(Mastertronic)	£1.99
6	(10)	Spy vs Spy	(Beyond)	£9.95
7	(7)	Soft Aid	(Various Artists)	£4.99
8	(–)	Jet Set Willy II	(Software Projects)	£7.95
9	(5)	Dynamite Dan	(Mirrorsoft)	£6.95
10	(–)	BMX Racer	(Mastertronic)	£1.99

All figures compiled by Gallop/Leisurescope

Top Twenty

1	(1)	Hypersports *(Spectrum/C64)*	**Imagine**
2	(4)	Frankie Goes to Hollywood *(Spectrum/C64)*	**Ocean**
3	(3)	Way of the Exploding Fist *(C64)*	**Melbourne House**
4	(2)	Frank Bruno's Boxing *(Spectrum)*	**Elite**
5	(15)	Dambusters *(Spectrum/C64)*	**Sydney/US Gold**
6	(–)	Action Biker *(Spectrum/C64)*	**Matertronic**
7	(18)	Beach-head *(Spectrum/C64/BBC/Amstrad/Atari)*	**Access/US Gold**
8	(–)	Beach-head II *(C64)*	**Access/US Gold**
9	(6)	Soft Aid *(Spectrum/C64)*	**Various Artists**
10	(–)	BMX Racer *(Spectrum/C64/C16)*	**Mastertronic**
11	(–)	Jet Set Willy II *(Spectrum/C64)*	**Software Projects**
12	(9)	Elite *(C64/BBC/Electron)*	**Firebird/Acornsoft**
13	(–)	Airwolf *(Spectrum/C64/Amstrad/C16)*	**Elite**
14	(12)	Red Moon *(Spectrum/C64/BBC/Electron/Amstrad)*	**Level 9**
15	(–)	Finders Keepers *(Spectrum/C64/Amstrad/MSX)*	**Mastertronic**
16	(–)	Nodes of Yesod *(Spectrum/C64)*	**Odin**
17	(–)	Combat Lynx *(Spectrum/C64/Amstrad)*	**Durrell**
18	(17)	Spy vs Spy *(Spectrum/C64)*	**Beyond**
19	(–)	Chiller *(Spectrum/C64/Amstrad)*	**Mastertronic**
20	(–)	View to a Kill *(Spectrum/C64)*	**Domark**

Figures compiled by Gallop/Leisurescope

Readers' Chart No 39

1	(3)	Hypersports (Spectrum)	**Imagine**
2	(2)	Elite (C64/BBC/Electron)	**Firebird/Acornsoft**
3	(4)	Way of the Exploding Fist (C64)	**Melbourne House**
4	(1)	Soft Aid (Spectrum/C64)	**Various Artists**
5	(5)	Dun Darach (Spectrum/Amstrad)	**Gargoyle**
6	(6)	Shadowfire (Spectrum/C64)	**Beyond**
7	(7)	Frank Bruno's Boxing (Spectrum)	**Elite**
8	(–)	Knight Lore (Spectrum/BBC/Amstrad)	**Ultimate**
9	(9)	Dynamite Dan (Spectrum)	**Mirrorsoft**
10	(9)	Revs (BBC)	**Acornsoft**

Winning phrase No 39: "Neil explodes if he gets too happy" from Simon Owen of Rednal, Birmingham, who receives £25. Runners up: include "Hype expert flogs lead ship to Tory wet" from J Brunett of Camberley and "Weather experts lost in fog" from T Burdis of London SW14.

Now voting on week 41 – £25 to win

Each week *Popular* is compiling its own special software top ten chart – compiled by YOU.

And each week we will send £25 to the person who sends in, with their chart votes, the most original (witty, neat or clever – but never rude) phrase or sentence made up from the letters (you don't have to use them all) in the titles of the top three programs in this week's chart, published above.

You can still vote in the chart without making up a slogan – but you won't be in with a chance of winning the prize.

All you have to do is fill in the form below (or copy it out if you don't want to damage your magazine) and send it off to: Top 10, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP.

Voting for Week 41 closes at 2pm on Wednesday September 4 1985. Entries received after that time will not be eligible for inclusion in that week's voting. The judges decision is final. Only one entry per individual per week will be allowed.

Name .....
Address .....
.....
.....

My top 3: Voting Week 41

1.....
2.....
3.....

My phrase is: .....

New Releases

RETARDED

Fu Kung in Las Vegas is a game I first saw on the Einstein (of all places) and the Amstrad version looks much the same, which is all in all a complaint since recent history shows it is possible to make Amstrad arcade games look considerably superior.

Neither does the game have much by way of exciting features – in fact mostly it's like *Manic Miner* in slow motion. Jumps, for example, seem to take ages as your wacky little man slowly drifts upwards and then slowly sinks back to earth. The nominal plot is collecting four cards in each casino, though strangely enough these casinos are populated with funny objects, bouncing things, ladders and the usual whizzo frippery.

Aside from being dull, unexciting and unoriginal, the game is also technically retarded and worse than run of the mill.

The only reason to buy it is if you have either a relative who was one of the programmers or a fetish for collecting absolutely every *Manic Miner* style game anyone has ever produced.

Program *Fu Kung in Las Vegas*
Price *£8.95*
Micro *Amstrad*
Supplier *Amsoft*
169 Kings Road
Brentwood
Essex
CM14 4EF

FLIPPERS

Pinball Construction Set is exactly what it says it is – a computer program that lets you design and then play a pinball game of your own choice.

Although the original version of this game, on the Atari, was out well over a year ago, it nevertheless features all the current trendy trappings of icons, a little cursor controlled hand and boxes that light up when you make a selection.

It isn't just a matter of choosing flippers, bouncy things in the middle I don't known the name of, and sundry other shapes that make your ball bounce back and forth.

You also choose how the ball behaves; speed, gravity, etc, and what sort of sound effects to include.

Setting up the board is incredibly simple: you simply use a little hand to shunt the shapes around and, once chosen, press the fire button to set them in place.

Obviously, your chosen set up can be saved and reloaded from disc. It's simple to use and is as good as your design to play – if you have a yen to play pinball on a computer this package has everything, except, unfortunately, tilt.

Program *Pinball Construction Set*
Price *£14.95*
Micro *Commodore 64*
Supplier *Ariolasoft*
Asphalte House
Palace Street
London SW1

Pick of the week

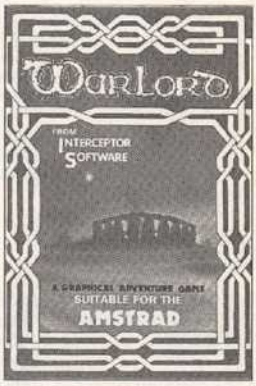
OTHER WORLDS

Of all the superb graphic adventures Interceptor have released, I think *Warlord*, the latest one, is the best. The plot is considerably more inventive than the usual bundle of vicious trolls and magic keys.

The story concerns the gods intervention in a bloody war between the Romans and the Celts. As the hostilities escalate, the gods themselves become embroiled in battle and to prevent total destruction of the world decide that a warrior from each army shall be transported to the mythical Celtic Otherworlds where magic and mythical beasts hold sway. You are the Celtic champion and must escape from the Otherworld back to the real world.

The graphics beautifully display the realm of ancient sites and standing stones – they represent Terry Greer's (the artist responsible for the graphics) finest hour.

It's difficult, although I found that kind deeds are well rewarded and felt dead chuffed. . . my elation lasted about five locations though, as I then met a warrior who refused to let me past. If *Warlord* goes on like this I may even start dressing up in funny helmets.



Program *Warlord*
rice *£8.99*
Micro *Amstrad*
Supplier *Interceptor Micro's*
The Green
Tadley
Hampshire

This Week

Program	*Type*	*Micro*	*Price*	*Supplier*
Cheops	Ad	Amstrad	**£8.95**	No Man's Land
Android Two	Arc	Amstrad	**£7.95**	Vortex
Brian Bloodaxe	Arc	Amstrad	**£8.95**	The Edge
Project Future	Arc	Amstrad	**£8.95**	Gremlin Graphics
Budget	Ut	Amstrad	**£14.95**	No Man's Land
CP Graph	Ut	Amstrad	**£12.95**	No Man's Land
File Manager	Ut	Amstrad	**£12.95**	No Man's Land
Warlord	ad	Amstrad	**£8.99**	Interceptor
Asteroids	Arc	Aquarius	**£1.50**	A Hodgson
Zithers	Arc	Aquarius	**£2.50**	A Hodgson
Organ	Ut	Aquarius	**£1.50**	A Hodgson
Chop Suey	Arc	Atari	**£12.95**	English
Stars and Planets	Ut	BBC	**£7.95**	Eclipse
Hit and Miss	Ed	C16	**£7.99**	Venturegate
Monty on the Run	Arc	Commodore 64	**£9.95**	Gremlin
Now Games	Arc	Commodore 64	**£8.95**	Virgin Games
QL Hypderdrive	Arc	QL	**£14.95**	English
Equate	Ed	QL	**£39.95**	Flire
Codename Mat II	Arc	Spectrum	**£8.95**	Domark
Nightshade	Arc	Spectrum	**£9.95**	Ultimate
Now Games	Arc	Spectrum	**£8.95**	Virgin Games
Southern Belle	Arc	Spectrum	**£7.95**	Hewson
The Epic	Arc	Spectrum	**£8.95**	Turtle Software
Way of Exploding Fist	S	Spectrum	**£9.95**	Melbourne House
Wordfinder	S	Spectrum	**£10**	WD Software
Solart	Ut	Spectrum	**£5**	D Pritchard

Key: Ad – adventure
Arc – arcade
Ed – education
S – strategy-simulation
Ut – Utility

SMARTER

We all know what a fabbo smash hit *Way of the Exploding Fist* was on the 64, don't we? Well, here is the first on the conversions – this time for the Amstrad 464 and the Spectrum version is also on the way in early September. How has it fared in its transcendental journey between machines?

Naturally, sound has been the first casualty. No continuous music, no screams of agony as you make your various moves . . . oh well. Secondly, gone are the different backgrounds, as you make your way up to 10th Dan – cue murmers of discontent.

When you get down to playing though, you probably won't mind, as the one player version is almost as fast as the Commodore . . . in fact if anything the computer opposition is just a little bit smarter than before. And the actual combat graphics are as good as ever, being a faithful reproduction of the Mark I version.

I've got the odd reservation about the two player option, however. Due to the fact the 464 has only one joystick port, when playing two player, at least one contestant must use the keyboard – and this takes some getting used to.

Still, this is an OK conversion which, no doubt, will be snapped up by the waiting Amstrad punters.

Program *Way of the Exploding Fist*
Price *£9.95*
Micro *Amstrad 464*
Supplier *Melbourne House*
Castle House
Castle Yard
Richmond
Surrey

TRIPLE JUMP

Summer Games II, due out later this month, proves to be a more than worthy successor to last year's *Summer Games*.

The American title, which will be marketed in this country by US Gold, has all the Epyx hallmarks of superb graphics and attention to detail.

The eight new events are the triple jump, rowing, javelin, equestrian, high jump, fencing, cycling and kayaking. As with its predecessor, success depends far more on precision timing, and co-ordination of a number of moves than demonic wrenching of the joystick.

The graphics are astonishingly good, although not as astonishing to anyone familiar with *SGI* – all the competitors retain that finely honed, athletic physique, and grace, even when the horse collapses and disintegrates halfway round the showjumping course or the kayak remains firmly glued to the bank.

Joystick movements relate as far as possible to real life – in the cycling, speed is achieved by rotating the joystick rather than waggling, while for the triple jump, a push to the right begins the hop (taking off from the right foot), to the right again for the step (right foot), left for the jump (left foot) and forwards through the air to the landing pit.

Ever meticulous, Epyx has included opening and closing ceremonies, and the close even has a jet-packer flying around the stadium à la Los Angeles.

Program *Summer Games II*
Price *£9.95*
Micro *Commodore 64*
Supplier *US Gold*
Unit 10
Parkway Ind Est
Birmingham
B7 4LY

GOOD VALUE

If you say that the averagely entertaining text adventure takes a couple of weeks to solve, then 99p is a whole lot of entertainment for very little. So, is *Crystal Quest* a good adventure?

In *Crystal Quest* you must boldly go in search of three crystals using the mighty starship USS Spectrum as transport. The plot unfolds both on the mighty etc, etc,

and down on the planet around which you are in orbit.

There is really only one complaint I have about the program – it has a redesigned character set, which ordinarily would be a nice touch, but in fact it makes the text very difficult to read.

Still, for the small amount I've been able to play of it – the adventure seems chock full of puzzles and has few 'wasted' locations, ie, rooms that don't have any real functions but just fill up the adventure. Excellent value and worth tracking down even if you have to buy it through the post (since I find it difficult to imagine many retailers taking anything this cheap).

Program *Crystal Quest*
Price *£0.99*
Micro *Spectrum*
Supplier *Central Solutions*
500 Chesham House
150 Regent Street
London W1R 5FA

A Hodgson, 60 Cross St, Upton, Pontefract, West Yorkshire WF9 1EU. **D Pritchard**, Solway Computers, Holme Lea, Liddle Terrace, Silloth Nr Carlisle, Cumbria. **Domark**, 204 Worple Road, London SW20 8PN. 01-947 5624. **Eclipse**, 79 Ardrossen Gardens, Worcester Park, Surrey KT4 7AX. 01-330 3116. **English**, Box 43, Manchester M60 3AD. 061 835 1358. **Flite**, Pearse road, Letterkenny, Co Donegal, Ireland. 074 23023. **Gremlin Graphic**, Alpha House, 10 Carver Street, Sheffield S1 4FS. 0742 753423. **Hewson**, 7 Grahame Close, Blewbury, Oxon OX11 9QE. 0235 832939. **Interceptor**, Interceptor Micros, Lindon House, The Green, Tadley, Hampshire. 07356 7145. **Melbourne House**, 39 Milton Trading Estate, Abingdon, Oxon OX14 4TD. 0235 835001. **No Man's Land**, 110 Bis, Avenue dy General Leclerc, Bloc 1 93506 Pantin Cedex, France. (1) 840 24 31. **The Edge**, 31 Maiden Lane, Covent Garden, London WC2E 8LH. 01-240 1422. **Turtle Software**, Bridge Street Mills, Witney, Oxon OX8 6YH. 0993 2557. **Ultimate**, Ultimate Play the Game, Ashby de la Zouch, Leicester, LE6 2JV. 0530 411485. **Venturegate**, 17 Harold Road, Leeds, LS6 1PR, Yorks. **Virgin Games**, 2-4 Vernon Yard, Portobello Road, London W11 2OX. **Vortex**, 24 Kansas Avenue, Off South Langworthy Road, Salford, M5 2GL. 061 872 4747. **WD Software**, Hilltop, St Mary, Jersey, Channel Islands. 0534 81392.

Crime and punishment

It is surprising that at a time when the computer is commonly given the blame for all kinds of disaster, little or no consideration seems to have been given to how computers should be punished for their crimes.

It is, of course, a little difficult to see how, for example, the three usual arguments for custodial sentences – retribution, deterrence and rehabilitation – may be applied to the case of an erring computer, but this is really only to say that custodial sentences may not be generally appropriate in such cases.

On the other hand, there is no doubt that there is in the ordinary person a very basic feeling that 'the punishment should fit the crime' and it is this feeling that may well be built on in considering the proper chastisement of computers. Built on, moreover, without having to consider any of the reservations about 'cruel and unusual punishments' that inhibit the use of this principle with human beings.

Thus the computers that caused difficulties in a recent launch of the Space Shuttle could be relegated as punishment to some substantially less interesting and exciting task; a year or so booking seats on airline flights might be thought appropriate. Similarly, the Navy computer in the Falklands that decided that Exocets were friendly, because they were French, might well be given a term of service in a language laboratory.

This kind of community service punishment is probably only suitable, though, for fairly minor offences. Sentences might be scaled up to sending to Coventry (particularly appropriate for computers in distributed networks) and full sensory deprivation techniques (pulling the plug).

Ultimately, there may be a case for applying for serious fault the ancient law of deodand whereby a personal chattel that had been the cause of the death of any reasonable creature was itself to be forfeit. As late as 1842 this law was applied to a railway engine that had been in an accident (Regina v Eastern Counties Railway Co).

Although the law of deodand was abolished in England in 1846, the argument for reintroduction seems strong, and it is noteworthy that A P Herbert reports in a more recent case (Haddock v Thwale, Uncommon Law 1935), a case where the Master of the Rolls ordered the destruction, on this principle, of a motor car that had injured the plaintiff.

One area where punishment of this kind is already built-in would appear to be the 'launch-on warning' computer system now being developed in the USA for defence purposes, although it may be argued that it is not altogether satisfactory to have the same retributive result arising from both function or malfunction.

Some will argue that we should instead punish the operators owners and programmers rather than the machines themselves, but this is by no means a compelling argument. To begin with, it is very difficult to assign responsibility to human beings with any certainty and without the complications that we observe every day in the courts.

Moreover, there is a well-tried historical precendent for the present proposal – that of using a 'whipping boy', often of noble birth himself, whose duty it was to suffer the punishments that could not be meted out to princes.

No doubt Charles I, for instance, who benefited from such an arrangement in childhood, would have been happy to have had it extended into his adult years.

And are we not all princes to our computers?

Gwyn Mellish

Painted faces

Puzzle No 172

When Bert cleared out his workshop he found three cubical blocks of wood. "Just the thing to saw up and make some toy building bricks for my grandson," he remarked.

Upon measuring the blocks he found them to be all exactly cubical in shape, each measuring an exact number of inches along the edges, although they were not necessarily all the same size. It was quite an easy task for Bert to saw all of them up into one inch cubes.

Now, the original large blocks had had all of their surfaces painted, and so when they were cut up there were some bricks that had one or more of their faces with paint on, and others with all six faces of newly sawn wood.

In fact, there were an equal number of painted and non-painted bricks. What was the smallest number of inch cubes that could have been present?

Solution to Puzzle No 167

A set of bricks arranged in piles of orders 3, 7, and 1 will contain 371 individual bricks.

```
10 FOR H=1 TO 9
20 FOR T=1 TO 9
30 FOR U=1 TO 9
40 LET N=H*H*H+T*T*T+U*U*U
50 IF N=H*100+T*10+U
   THEN PRINT H;T;U
60 NEXT U
70 NEXT T
80 NEXT H
```

The solution depends on finding a three figure number which is equal to the sum of the cubes of its digits.

This is done using the three *For/Next* loops *H*, *T*, and *U*, to represent the hundreds, tens, and units digits respectively. The sum of the cubes is calculated and compared with the number denoted by the original digits. Values that correspond are printed out.

Winner of Puzzle No 167

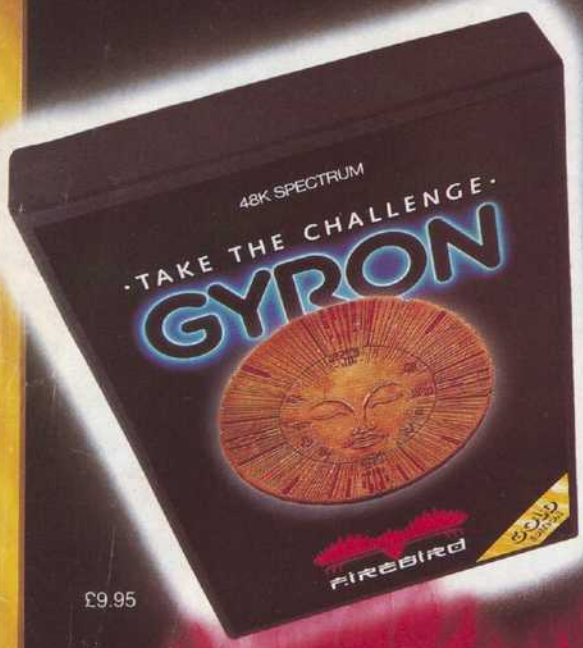
The winner is M Eastgate of Canley, Coventry, W. Midlands, who receives £10.

Rules

The closing date for Puzzle No 172 is September 25.

The Hackers

FROM OUT OF THE FIRE.



£9.95

Tape £14.95
Disk £17.95

firebird

£5.95

GYRON · Spectrum 48K
"A serious contender for the Game of the Year award"
Personal Computer World. Mar. 1985

"Hyperbrill"
Crash 'Smash', 93% rating. Mar. 1985

ELITE · Commodore 64
"The game of a lifetime"
Zzap! 64. Gold Medal Award. May 1985

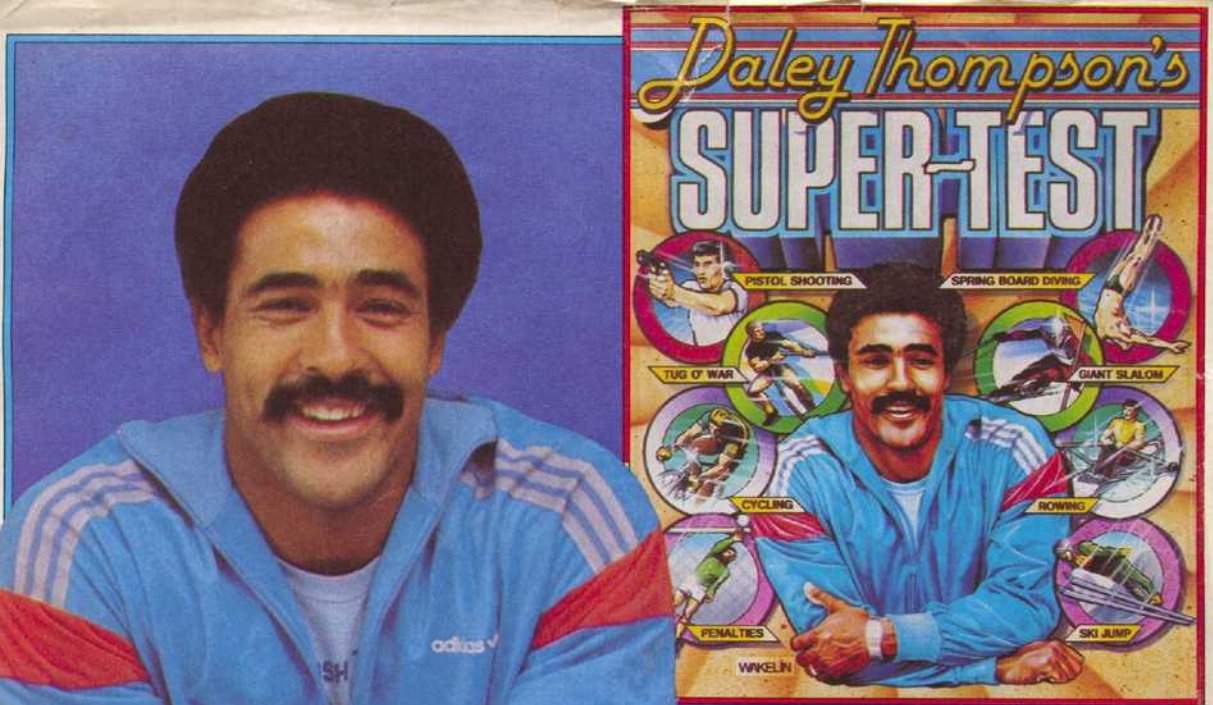
BUGGY BLAST · Spectrum 48K
"This is what I call fun... an addictive and very playable game"
Crash 'Smash'. 91% rating. Feb. 1985

DEMONS OF TOPAZ · Commodore 64
"Its addictiveness grows from strength to strength"
Commodore Computing Int. Game of the Month. May 1985

£5.95

Firebird is a Trade Mark of British Telecommunications PLC
Elite is a Trade Mark of Acornsoft Ltd
© Acornsoft 1984 © BT 1985

FIREBIRD SOFTWARE · WELLINGTON HOUSE
UPPER ST MARTIN'S LANE · LONDON WC2H 9DL



Summon every ounce of strength and stamina ..rise to the challenge of my 'SUPER-TEST'

SPECTRUM 48k 6·95 COMMODORE 64 7·95 AMSTRAD 8·95

Ocean Software is available from selected branches of:
Boots, WHSMITH, John Menzies, WOOLWORTH
LASKYS, Rumbelows, Greens
Spectrum Shops and all good software dealers.

ocean

Ocean House · 6 Central Street · Manchester · M2 5NS · Telephone 061 832 6633 · Telex 669977 Oceans G