

POPULAR **Computing** WEEKLY

Only 40p.

27 September—3 October 1984

It's the best selling weekly

Vol 3 No 39



THE seventh Personal Computer World Show was held over four days at Olympia last week. Acorn previewed its new business computers, and the new range of Act Apricot computers were on public display for the first time. Full show report inside on page 13.

MSX launch

THE MSX computer system was officially launched last week by the seven Japanese members of the UK MSX Working Group — Canon, Hitachi, JVC, Mitsubishi, Sanyo, Sony and Toshiba.

All of the machines are based on the MSX design standard incorporating the Z80 processor and use a version of Basic developed by Microsoft.

The models and prices are as follows: Canon V-20, 64K, £280.00, available end October; Hitachi HB-H80, 64K, price as

yet unannounced, available around April 1985; JVC HC-7, 64K, £279.00, available end October (printer and disc drive early 1985); Mitsubishi (two models) ML-F48, 32K, £249.00 and ML-F80, 64K, £299.00, both available in November (discs available in 1985); Sanyo MCP100, 64K £299.95, available mid-October; Sony HB-75B (Hit-Bit), 64K plus additional 16K Rom for simple data handling (the UK version, unlike its Japanese counterpart, has a

continued on page 5

Sinclair profits let-down

SINCLAIR Research's profits rose only by a disappointing £253,000 to £14.28m in the year ending March 1984.

Turn-over rose over the same period from £54.5m to £77.7m, according to Sinclair's Financial Statement for 1984, published last week.

In the report, Sir Clive Sinclair accounts for the relatively small increase in profit against turnover rise by saying that "the pocket television and the QL computer both added to costs in the year but little to sales".

The 42% increase in turnover is attributed to continuing demand both in the UK and overseas for the ZX Spectrum, its

peripherals and software.

After Timex pulled out of the US market, due to the price war in the States, Sinclair, whose technology was used by Timex also lost a possible £9m plus in turn-over, judging from 1983 figures.

However, the QL is due to be launched in the US before the end of 1984 on mail order, and Sinclair expects it to sell strongly.

Sinclair is apparently relying on high QL sales to increase profits prior to the company's planned flotation next year. Expenditure on raw materials and consumables rose sharply from £33.7m to £54.9m, implying a much heavier research commitment, and stocks of hardware now stand at £7.2m as against £3.8m. The company's net profit fell from 25% of turn-over in 1983 to 16% in 1984.

● *Bandersnatch*, one of the two unfinished Imagine 'mega-

continued on page 5

The 1984 Microcomputer Chess Championships have been won by a new program developed by Psion for the QL.

Psion Chess will be available next month, priced at £19.95.



ACORN'S ABC PREVIEWED

INSIDE } PCW SHOW } AMSTRAD PAGE } PSION ORGANISER }

CURRAH μ SPEECH



Speech Synthesiser for ZX Spectrum

The **CURRAH μ SPEECH** is ready to talk immediately on power-up, has an infinite vocabulary and outputs speech and ZX Spectrum sound through your TV speaker. There is no software to load with **μ SPEECH** — sophisticated Gate Array technology means you can just plug in and start constructing words and sentences like this:

LET SS = "sp(ee)k (nn)(oo) (ee)vil" will say "speak no evil"! Further commands control the "voicing" of keys as they are pressed, and an intonation facility allows you to add expression to the speech.

μ SPEECH is fully compatible with ZX Interface 1 and may be used with the **CURRAH μ SLOT** Expandable Motherboard, allowing easy expansion of your ZX system. **μ SPEECH** and **μ SLOT** will also be compatible with the **CURRAH μ SOURCE** unit when it arrives later this year, allowing you to write **Assembler** and **FORTH** statements directly into your **BASIC** programs!

Top selling games like **ULTIMATE'S Lunar Jetman** feature **μ SPEECH** voice output — watch out for other titles from Bug-Byte, CDS, Ocean, Quicksilver and PSS.

μ SPEECH is available from **COMET, W.H. SMITH, WOOLWORTHS, GREENS, BOOTS, JOHN MENZIES, SPECTRUM STORES** and good dealers nationwide — or use the form to order the **CURRAH μ SPEECH** — winner of the CTA 'Product of the Year' award 1984.

CURRAH

To: **MicroSpeech Offer, P.O. Box 1, Gateshead, Tyne & Wear, NE8 1AJ**

Please Supply **MicroSpeech** unit(s) at **£29.95** each incl. VAT & P & P.

MicroSlot unit(s) at **£14.95** each incl. VAT & P & P.

Name (please print) _____

Address (please print) _____

Postcode _____

I enclose a cheque/PO payable to 'MicroSpeech Offer' value £ _____

or debit my Access/BarclayCard No.

Cardholder Signature _____

Credit Card Hotline 091 - 462 4683

Please allow 28 days for delivery. Offer valid UK only.

See us at the PCW Show Stand 329

> View

So another Personal Computer World Show has come and gone and this year it left me feeling rather flat.

It seemed that the event is now very nicely predictable.

Even taking into account the new Apricots and Acorns, everything remains in its proper place and under control.

A far cry from the same event only a few years ago which could only have been described as a shambles. Yet it was definitely more exciting then.

It was interesting, therefore, that the seven MSX companies decided against exhibiting at the show because they wanted to distance themselves from the 'hobbyist' industry. The show isn't like that anymore — the dedicated 'hobbyist' is fast becoming an endangered species — rather like the unfortunate tiger cubs on the Microvitec stand.

Something important is being lost. Not that a hand-built colour board for the ZX81 should be regarded as the ultimate achievement.

Rather, it is that things have possibly now swung too far in praise of commercialism.

The business is now ruled by The Big Licencing Agreement — Danger Mouse, *The Magic Roundabout*, Eddie Kidd, *Ghostbusters*, Daley Thompson.

The actual quality of the program itself is now almost irrelevant with the magnitude of the deal being of paramount importance. And that is to be regretted.

Somewhere in the transition from hobby to big business — in the chaotic surge of the industry — the priorities have got a little mixed up.

POPULAR Computing WEEKLY

Vol 3 No 39

> Presents...

News > Amstrad disc drive > new games for ultimate

Star Game >

Build a wall between yourself and certain death in *Wall of Doom* for Commodore 64

Show Report > Christina Erskine reviews the highlights of this year's Personal Computer World Show

Software reviews > Database's *Mini Office* aims to provide business applications at a low cost >

Hardware Preview > First impressions of Acorn's new business computer range by Jeff Naylor

Hardware Reviews > Barbara Conway tries out the Organiser, Psion's pocket computer >

Spectrum > New keyboards for Interface 1 from Barry Lowry

Amstrad Amstrad on the move — screen animation from Graham Paterson

The QL Page > User-defined characters in R Snowdon's program

Commodore 64 > Simon Wallace sets up an automatic error recovery routine

BBC & Electron > Andrew Heptonstall's program helps to teach young children to tell the time

Best of the Rest

Letters Tape Offer 7, Competition — final week 14, Open Forum 50, Arcade Avenue 50, Microradio 51, Baud Walk 52, Adventure Corner 54, Peek & Poke 58, Diary 66, Top Ten, This Week 67, New Releases 68, Ziggurat, Puzzle, Hackers 70

5

10

23

26

32

13

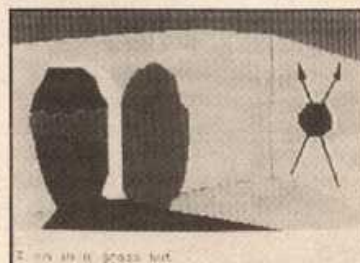
16

20

35

41

45



> Futures...

Brother printer review ... Star Game is *Helicopter Fury* for the Amstrad ... and a mysterious adventure on the BBC

Editor David Kelly News editor Christina Erskine Features editor Graham Taylor Software editor John Cook Production editor Lynne Constable Editorial secretary Geraldine Smyth Advertisement manager David Lake Assistant advertisement manager Alastair Macintosh Advertisement executive Tom Watson Classified executive Diane Davis Advertising production Lucinda Lee Administration Theresa Lacy Managing editor Duncan Scot Publishing director Jenny Ireland. Published by Sunshine Publications Ltd, 12-13 Little Newport Street, London WC2R 3LD. Tel 01-437 4343 Telex 296275 Typeset by The Artwork Group, 55-63 Goswell Road, London EC1, in association with Ink on Paper Ltd Printed by East Midland Litho Printers Ltd, Oundle Road, Woodston, Peterborough PE2 9QR Distributed by S M Distribution, London SW9, tel 01-274 6611, telex 261643. © Sunshine Publications Ltd 1984.

ABC

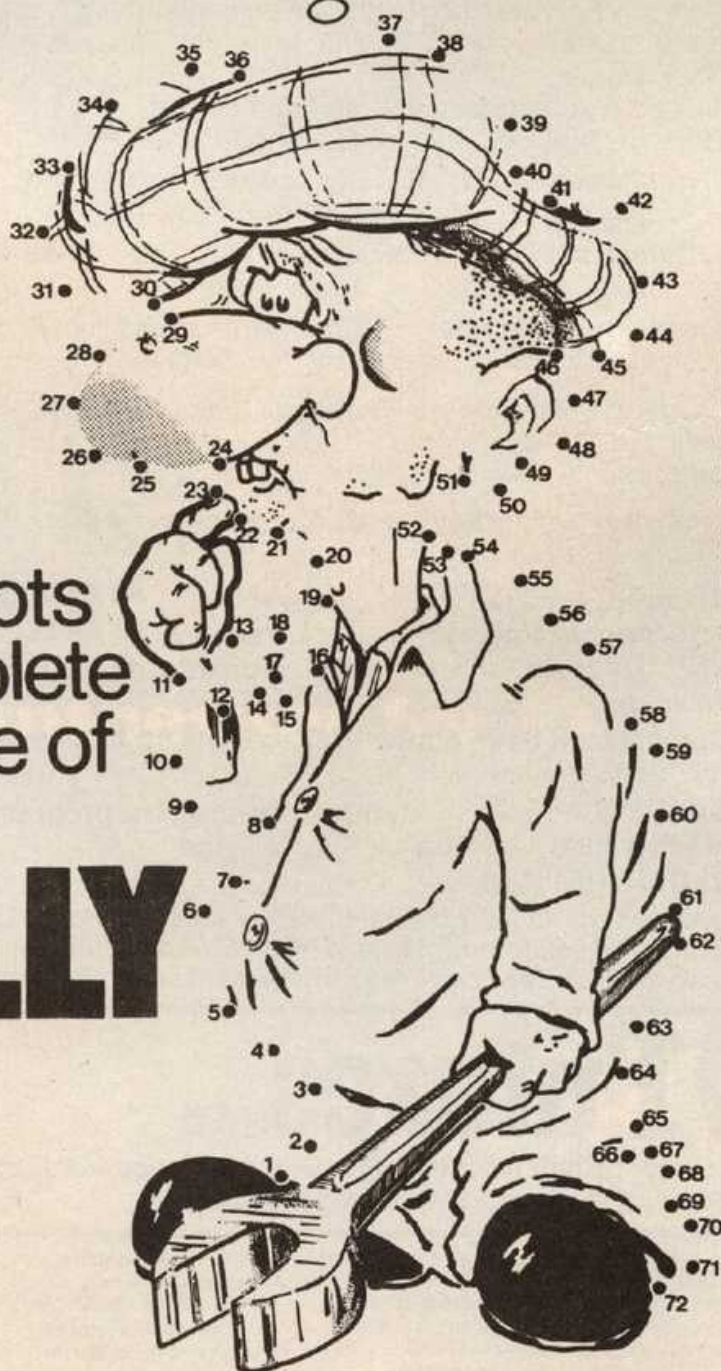
56,052 copies sold every week
(Jan-June 1984 ABC).

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

Computer Trade Association Magazine of the Year

Watch out for Wally in a dream of a Program, Pyjamarama.

AUTOMANIA



Join the dots
and complete
the picture of
a right....

WALLY

CRASH MICRO COMMENTS

Keyboard play: very responsive

Use of colour: very good

Graphics: superb, with excellent animation

Sound: great tune (continuous) with well used sound effects – sound may be switched off

Skill levels: 1

Lives: 3

• 'Automania has some of the best animation and realistic graphics that I have ever seen. All the graphics are large and colourful, and needless to say they move smoothly.'

SOLID GOLD

(Home Computing Weekly)

instructions	100%
playability	100%
graphics	100%
value for money	100%



Sensational Software from

MIKRO-GEN

44 The Broadway, Bracknell.

Tel: (0344) 427317

Available for Commodore 64 and Spectrum 48K

MSX

Continued from page 1

'professional' quality keyboard), £299, available October (also available in October the Sony HBD-50 360K capacity 3½-inch disc drive); Toshiba, HX-10, 64K, £279.95, available end September (also a printer/plotter, £249.95, and a dot-matrix printer, £349.95, both available in October).

Commenting on the MSX system, Chris McLaughlin for the MSX companies commented, "We may either love MSX or hate it as a standard but it's a final solution to the problem of compatibility — achieved by consensus within the majority."

"Nobody is standing up and saying that the Z80 is knife-edge state of the art stuff. It's not necessarily the best — but it's workable — and we can build applications such as home banking and home shopping around it."

"The pricing side was never discussed by the MSX companies together but originally they were hoping to produce them at around £250 — but the way the yen has been going against the pound has meant the cost has had to go up."

Over fifty UK software houses are now committed to supporting MSX. They include Alligata, Andromeda, Artic, Bug-Byte, DK'Tronics, Hewson, Hi-soft, Llamasoft, Mastertronic, Micromega, Ocean, PSS, Quicksilver, Terminal and Virgin.

None of the MSX companies exhibited at last week's Personal Computer World Show. An MSX spokesman explained that MSX is intended as the world's first family computer standard and the seven electronics giants wished to remain apart from the 'hobbyist' end of the industry.

● Casio, Brother and Sharp all now have gained MSX licences and Casio has released an MSX computer in Japan.

Sinclair

Continued from page 1

games' may eventually appear under the Sinclair label.

It is thought that Sinclair is in negotiations to buy *Bandersnatch* from Imagine's receivers, although neither Chris Chambers, the receiver, nor Sinclair were prepared to comment on the possibility.

New year machines

ATARI US has announced that it will release new 16 and 32-bit machines early next year.

The 16-bit machine, Atari Corporation president Sam Tramiel said in an interview in Taiwan, will be launched in January 1985, and be non-IBM compatible. He claimed the machine had already been designed by Atari engineers.

The 32-bit micro will be a development from that computer, and be introduced next

April.

Sam Tramiel—son of Atari chairman Jack Tramiel—said it would cost less than \$1,000 (around £800-£850). If true, the machine could start another computer price-cutting war in the US. IBM's and Apple's nearest competitors both cost over \$2,000.

Atari has set a production target for 1985 for these machines of between three and five million at sites in Ireland and the Far East.

Ghosting for Activision

GHOSTBUSTERS, the hit US movie, will be available in the UK as a computer game before the film is released here.

Activision has acquired rights from Columbia Pictures

December," said Activision's UK managing director, Geoff Heath. "It features both characters and music from the film, and will be a mix of arcade and strategy action."

Ghostbusters (the game) has been designed by David



to develop software based on the film, the theme music of which is currently riding high in the British top ten.

"Our game version will be on sale by mid-November while the movie goes on release in

Crane, who also designed *Pitfall*, *Pitfall II* and *Decathlon*. It will be simultaneously released for the Atari VCS, Commodore 64 (£10.99), Spectrum (£9.99) and MSX (£11.99) machines.

Top team for Beyond

BEYOND Software has signed up a top programming team to develop a graphic adventure for Beyond.

The team of six programmers—calling itself Denton Designs—includes Ian Weatherburn and John Gibson, both of whom were previously with Imagine Software working on its *Bandersnatch* 'mega-game'.

"The graphic adventure has a working title of *Shadow Squad*, and will be ready in the New Year," said Terry Pratt of Beyond. "The player controls six screen characters, each with individual weaknesses and strengths, sent to a 'Deathstar'-type place on a diplomatic mission."

The adventure uses English text commands, with different graphics for each screen. The player must co-ordinate all six characters to complete the mission.

The game will be released for both the Spectrum and Commodore, priced between £8 and £10.00.

Stratos-jamais!

ORIC has now said that there is no possibility of its new machine—a successor to the Atmos, based around the 6502 processor—being launched this year.

An Oric spokesman said, "It was originally our plan to launch the micro in France before the end of 1984, but there is now no question of it appearing this year. Oric are, however, currently working on

Disc unit for the CPC 64

AMSTRAD has announced its DDI-1 disc unit and interface for the CPC464 micro.

The drive is based on the 3-inch Hitachi standard and is a 169K 40-track double-sided double-density disc system.

The disc operating system is either AMSDOS — an extension to locomotive Basic with simple filing commands, or the Digital Research standard CP/M. The system is also file compatible with the single-sided format used by CP/M on the IBM PC.



The CP/M disc is bundled free with the Amstrad disc system. As well as the CP/M disc each drive is bundled with *Dr Logo* on disc, the Digital Research version of *Logo*.

The drive, plus interface, CP/M and *Dr Logo* is priced at £199.95. The system can also support a second disc drive for which an additional interface is not required. The additional disc unit is priced at £159.95.

Sabre Wulf follow up

TWO follow-ups to Ultimate's highly successful *Sabre Wulf* are to be released shortly.

Underwulde and *Knight Lore* both continue the adventures of the Sabreman.

Underwulde is an arcade-style game in which the Sabreman must do battle against the inhabitants of the Underwulde in over one hundred screens. *Knight Lore* is, according to Ultimate, "the first step in a new generation of computer adventure simulation developments".

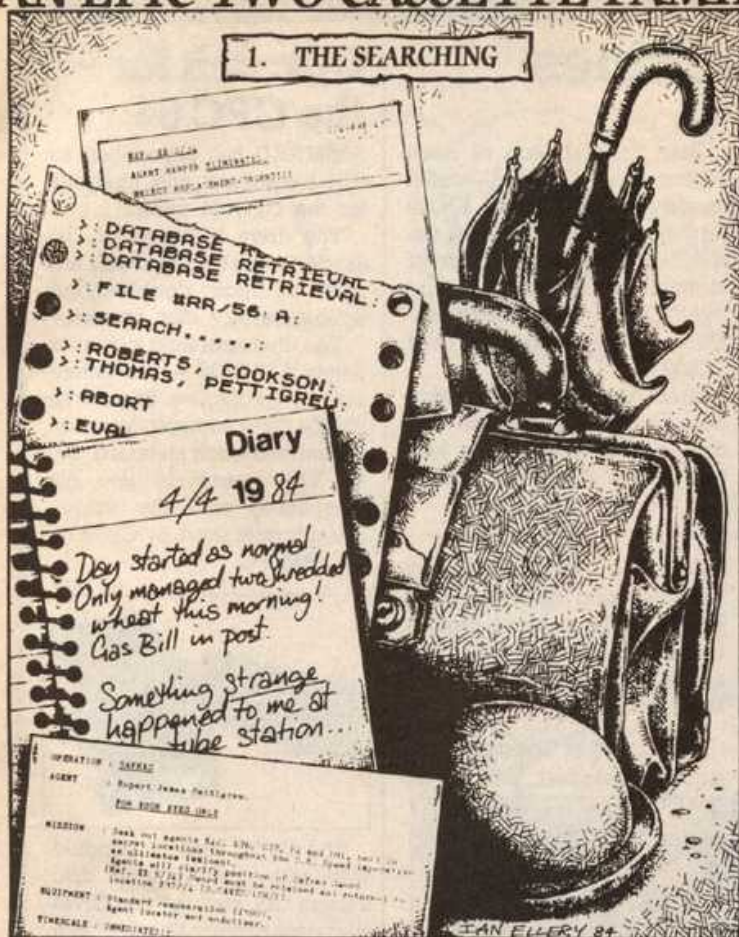
Underwulde and *Knight Lore*, both for the 48K Spectrum, will cost £9.95 each.

a number of new products."

The machine had a working title of 'Stratos'—this will now not be used as another computer company also has a product with that name.

SHARDS SOFTWARE PRESENTS
AN EPIC TWO CASSETTE FAMILY ADVENTURE IN FOUR PARTS

1. THE SEARCHING



2. THE RETURNING



THE PETTIGREW CHRONICLES

3. THE DISCOVERY



4. THE CONCLUSION



Selected
Stores

AVAILABLE NOW AT ALL GOOD STOCKISTS or by MAIL ORDER
from SHARDS SOFTWARE Roycraft House Linton Road Barking Essex
(send cheque/PO) OR Telephone through your Access/Visa order to 01-591 7666

COMMODORE 64
SPECTRUM 48k
£9.95

Commodore compatibility

Now that production of the Vic 20 seems likely to cease, what will us Vic owners do for software? The C16 has a 16K memory, but are there any plans to make its software compatible with the Vic? If not, will Vic software still be available in the shops?

Jason Watts
13 Winifred Avenue
Hornchurch
Essex

C16 software is not compatible with the Vic20 but Commodore says that it will continue to provide software support for the Vic20.

All change in Superbasic

To alter Alan Turnbull's program *QL Rom* (September 20 issue) for use on the latest Superbasic version JM, change the table address in Lines 190 and 230 to 26724 and 27400, respectively.

Thanks to Alan for this useful little program.

Jonathan Treadgold
11 Bellhouse Walk
Rockwell Park
Bristol
BS11 0UE

From the arcades

I am writing to complain about your review of *Gilligan's Gold* for the Commodore 64. It appears to me that the reviewer has never been into an arcade. If he had, it may have come to his attention that the game is in fact a copy of *Le Bagnard*, a game which has had some success in the arcades.

I would also like to point out that not every game involving moving a player round a screen and climbing ladders is a rip-off of *Manic Miner*. In fact, *Manic Miner* was not the first game of its sort. *Miner 2049'er* for the Atari came out long before *Manic Miner* and is very similar to it. *Miner 2049'er* may have been the game that spur-

red the programming of *Manic Miner*.

Guy Norton
The Wellyards
Old Road
Weston
Staffs

It is up to the reviewers whether they choose to judge a game entirely on its own merits, or to draw comparisons with other titles.

Better late than punctual?

Both the more recent Sinclair computers were plagued with late arrival dates and broken promises and, consequently, attracted masses of publicity which certainly does not seem to have done any harm to their popularity.

Amstrad, however, arrived on time as a complete package and only seems to have attracted the requisite reviews.

Does this mean that computers have now gravitated to the level of film stars where any publicity is good for the image?

G Phillipson
GP Computer Services
14 Newton Court
Outwood, Wakefield
W Yorks

Microdrive conversion

Re the *Peek & Poke* query in the September 13 issue, entitled 'Copy on to Cartridge'.

It is possible to copy *Vu-File*, *Vu-Calc*, and even *Scrabble* to microdrive. R M Jones should write to Draysoft, 2 Bedford



Way, Rugeley, Staffs WS15 1LB, which supplies excellent conversion programs for the above (I know as I've used all three successfully).

R M Jones could also try the Kopykat microdrive conversion program—but it will not work on *Pinball*.

Brian Holden
London

Query answered

I sympathise with John Lawlor (Vol 3, No 38) and Brian Johnson (Vol 3, No 37) with their QL problems. In my experience, Sinclair rarely answer queries. However my Ver 5 is also AH Rom and maybe I can throw some light on *Dline*, *Merge* and the user procedure utility program. Firstly, *Dline* type with no space after D but space after E then Line Number. Example: *Dline* space line number. Enter. This removes the line but easier still and less typing is to type only the line number then press

Enter and hey presto, disappeared, you don't need to type *Dline*.

The user procedure utility program has problems on lines 30315 and 30360 — just edit the word *Merge* on both lines and replace with *Load*. This makes all the functions work correctly.

Now to *Merge*. On the QL it does work but it's not very well explained in the manual. If we start with an example, type: 10 PRINT "OWN NAME" press Enter then type SAVE MDV1—NAME. Now type: 20. PRINT "AND WIFES NAME", press Enter then type: Merge MDV1—NAME and press Enter. Now type Run and on the screen you will see "OWN NAME AND WIFES NAME." You can only merge a program already in memory with one on a microdrive. You cannot merge a program on MDV1 and one on MDV2 without loading one to memory first.

Brian McNulty
14 Millfield Rd.
Bridlington
East Yorkshire

Special Tape Offer—Week 2

Only £1.50

plus 25p post and packing

Nightmare Planet Adventure

on the Commodore 64

All you have to do to get your copy of the *Nightmare Planet* text adventure written by Mike Grace is to collect the three special coupons from the magazine printed last week, this week and next week and send them off, together with your name and address and a cheque or postal order for £1.75 (made payable to Sunshine Books) to: 'Nightmare Planet Offer', Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

Learn to Fly Competition—the final week's coupons are on Page 14.

2



Showing soon at your local computer store See press for details

Tremble thee who disturb the slumber of the undead...

POLTERGEIST

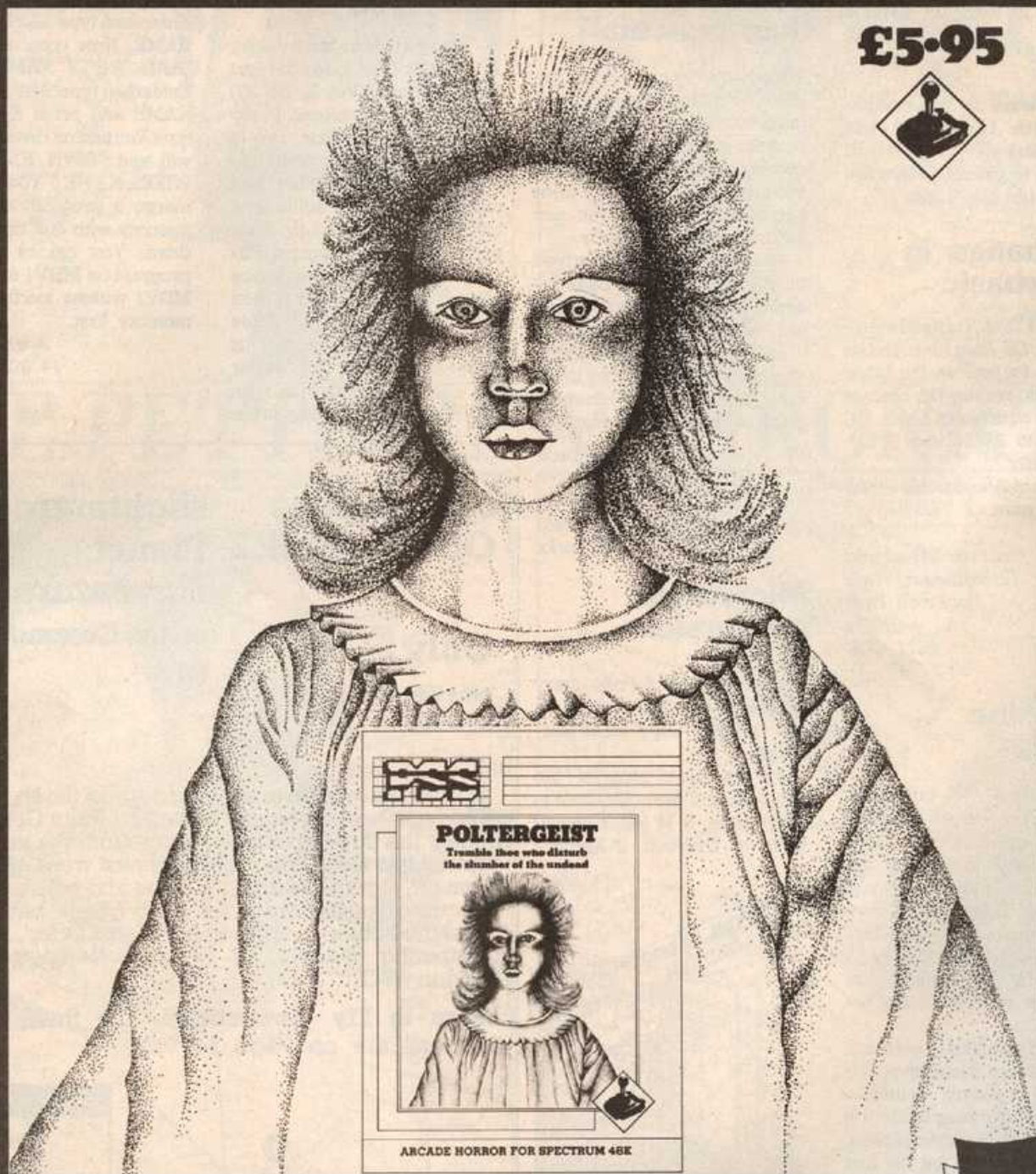
ARCADE HORROR FOR SPECTRUM 48K

The mansion was built - all comfort and luxury. But - an unfortunate truth - the ground on which it stood was not yet dead. An old graveyard containing the trapped souls of the undead!

They've used the combined might of their para psyches to force a gateway into the world of the living and have created a manifestation of the phenomenon - poltergeist.

A fully animated 3D display with dozens of objects including spinning lamps, tables, chairs etc. The devastation continues through the many rooms of this possessed and unhappy place until you have all the equipment you're going to need for the final confrontation with the evil spirit itself ...

£5.95

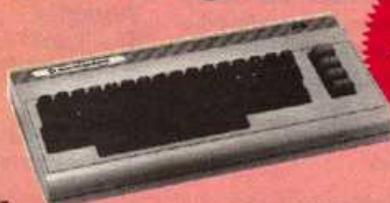


PHONE YOUR BIG "COMMODORE" DEALER

FOR DETAILS OF THE COMMODORE COUP



A sensational portable colour computer with a powerful 64K RAM memory, a detachable full-function keyboard and a built-in colour monitor and disk drive



CBM64

Colour sophisticated ROM/RAM user, UHF/Composite video, high resolution graphics



**1701
COLOUR
MONITOR**

A great value colour video monitor.

**COMMODORE
SX-64
PORTABLE**

A top quality disk drive offering quick-access mass data storage

**1541
DISK
DRIVE**



A high-quality dot matrix printer with excellent graphics capability. Accepts tractor feed paper. 50 c.p.s.

**MPS801
PRINTER**

"Other Commodore products in stock include the: CBM 1530 C2N Cassette, CBM 1525 Printer, CBM 1520 Plotter, CBM 1311 Joystick, and DPS 1101 Printer."



**Up to £1000 instant credit
— write for details**
Micro Management, 16 Princes Street,
Ipswich, Suffolk, IP1 1QT

Phone your nearest dealer for the most competitive prices

Bucks
Citybench
24 Eaton Place
Marlow
06284 75244

Micro Land
Weatherburn Court
Brunel Centre
Bletchley
Milton Keynes
0908 348013

Cambridge
G.C.C. Cambridge Ltd
66 High Street
Sawston
Cambridge
0223 835330

Cornwall
Computavision
4 Market Street
St Austell
0726 5297

Derby
First Byte Computers
10 Cartledge
London Road
Derby
0332 365280

Devon
Computer Systems (Torbay)
35 Hyde Road
Plymouth
0803 524284

Boy Hart Computer Services
10 Fore Street
Tiverton
0884 253468

Dorset
Solent Micro Systems Ltd
25 Borgeles
Christchurch
0202 479458

Durham
General Northern Computing
8 Whitworth Road
South West Ind. Estate
Peterlee
0783 660314

Essex
Essex Computer Centre
216 Moultham Street
Chelmsford
0245 356702

Focus Computer Systems
140A Hathaway Road
Grays
0375 79717

County Computer Stores
50 West Square
Harlow
0279 414692

The Home Computer Centre
261 Victoria Avenue
Southend-on-Sea
0702 43568

Glouce
The Model Shop
22 High Street
Stroud
04536 5920

Sabre Consultants Ltd
103 High Street
Tewkesbury
0684 298666

Herts
County Computer Stores
95a South Street
Bishops Cleeve
0279 506801/2

Hobbylife
153 Grove Road
Horpenden
0567 3542

Lancs
Amat Computing
67 Friars Gate
Preston
0772 561952

London
Henry's Computer Shop
404 Edgware Road
London
01-402 6822

Miracle Computers
245A Coldharbour Lane
London
01-274 7700

Greater Manchester
Entertainment in Leisure
88 The Rock
Bury
061 797 3463

Control Technology
164 Market Street
Hyde
061 306 8223

Midsexes
Infinit Communications Ltd
135 High Street
Ponders End
Enfield
01-805 7772/7434

N. Humberdale
Beverley Computer Centre
40 Northgate
Beverley
0482 881911

S. Humberdale
Ashby Computer Centre
247 Ashby High Street
Scunthorpe
0724 871756

Kent
Soligate Computers
249 Beaver Road
Ashford
0233 37187

Data Store
6 Chatterton Road
Bromley
01-460 8991

Canterbury Software Centre
9 The Friars
Canterbury
0227 53831

North Kent Computer Centre
5254 Beilgrave Road
Welling
01-301 2677

Twistler Computers
17 Regina Road
Southall
01-574 5271

J.K.L. Computers
7 Windsor Street
Uxbridge
0895 51815

W. Midlands
Impulse Computer World
40 Northgate
Coventry
0203 27711

Wolverhampton
Computer Centre
17-19 Lightfield Street
Wolverhampton
0902 29907

Northfolk
Abacus
12a Portersgate
Norwich
0603 61441

Viking Computers
Ardrey Rise
Cotton Grove Road
Norwich
0603 45209

Somerset
Snewave Computer Services
Corporation Street
Taunton
0823 57626

Staffs
Eric Reynolds Ltd
86 High Street
Burton-on-Trent
0283 65806-65869

Town Computer Store
30 Town Road
Hanley
Stoke-on-Trent
0782 267540

Suffolk
Suffolk Computer Systems
16 Swadlow Street
Sutton
0756 68192

Suffolk
Brainwave
24 Crown Street
Ipswich
0473 50906

Micro Management
32 Princes Street
Ipswich
0473 59181

Surrey
Canasta Computer
Consultants Ltd
1 Carlton Road
S. Croydon
01-881 6842

E. Sussex
Garner
24 Gloucester Road
Brighton
0273 698424

W. Sussex
Orchard Business Systems Ltd
34 East Street
Worthing
0403 64461

Worthing Computer Centre
32 Liverpool Road
Worthing
0903 210861

Tyne & Wear
Video & Home Computers Centre
3 Rosburgh House
Park Avenue
Whitley Bay
0632 534725

N. Yorkshire
Skipton Computer Systems
16 Swadlow Street
Skipton
0756 68192

W. Yorkshire
Thoughts & Crosses
37 Market Street
Heckmondwike
0924 402 337

N. Ireland
Everyman Computers
80 Charlotte Street
Ballymoney
Co Antrim
02856 62116/62658

Wales
Automation Services
42 Dunroven Place
Bridgend
Mid Glamorgan
0656 3550

Scotland
Micro Store
38 The Arcade
King Street
Stirling
Central Region
0786 64571

For your nearest European
Dealer telephone Belgium or
Holland

Belgium
Micro Management
Belgium
Schaerstraat 75
2018 Antwerp
Belgium
03-236 9284

Holland
Micro Management
Netherlands
Rood Huisstraat 98 2406
Am Alphen-aan-den-rijn
01720 - 72580

Wall Of Doom

Can you build up your defences and prevent the aliens from getting through? Find out in Yves Suys' game for the Commodore 64

In *Wall of Doom* for the Commodore 64, you must build a brick wall to protect yourself from alien enemies. You have a time limit of just two minutes to complete the wall before death is inevitable.

The listing should be easy to follow and understand, with plenty of Rem statements.

Program notes

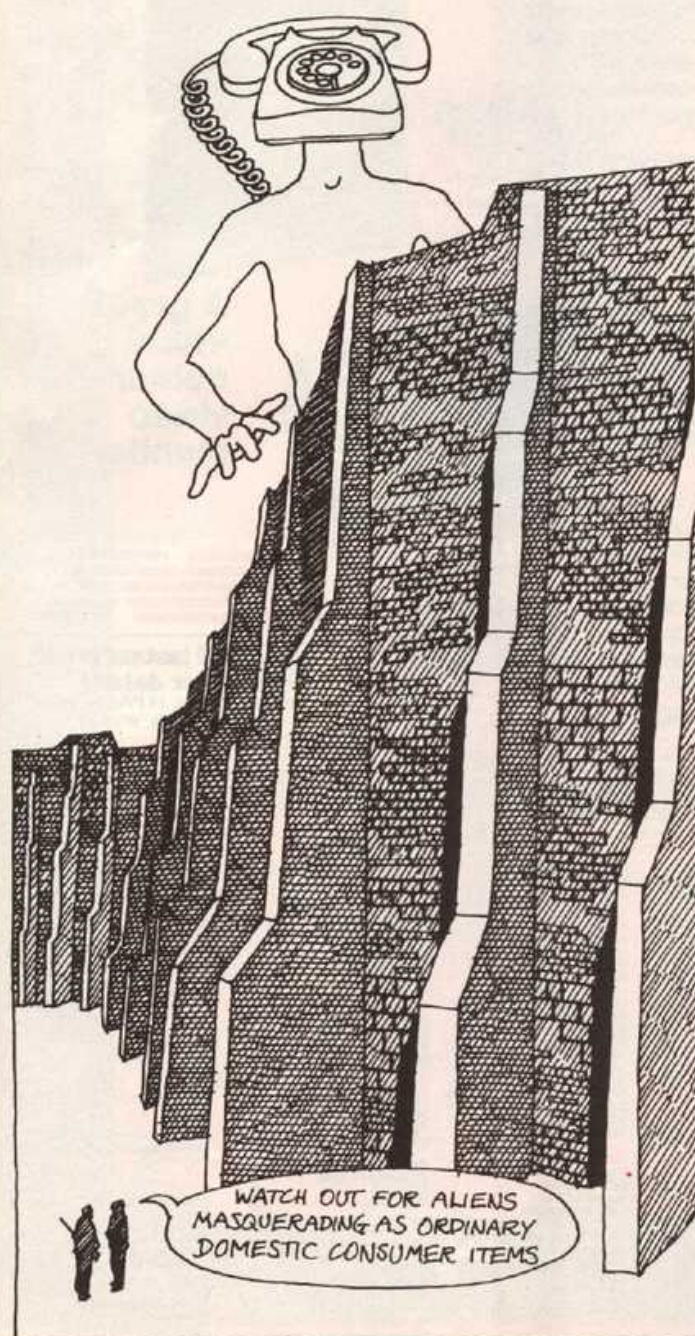
50 sets up the sound

160-200 sets up the graphics
479-560 prints the instructions

Variables

HF	high frequency
LF	low frequency
DR	decay release
VI	lives
SC	score
HISC	high score

TIS	time
F	X sprite 1
C	Y sprite 1
L	X sprite 2
M	Y sprite 2
H	X sprite 0
K	Y sprite 0
DS	hours
BS	minutes
CS	seconds



```

1 REM*****SOURCE FILE*****
2 REM* AUTHOR : Y. SUYS *
3 REM* FROM WEMMEL *
4 REM* (BELGIUM) *
5 REM* JANUARY 1984 *
6 REM*****
7 HISC=0
9 POKE650,128
10 GOTO480
20 REM*****
30 REM* SOUND'S INITIALISATION *
40 REM*****
50 S=54272:FORL=STOS+24:POKEL,0:NEXT
60 POKES+5,9:POKES+6,0:POKES+24,15
70 READHF,L,F,DR
80 IFHF<0THENRETURN
90 POKES+1,HF:POKES,L F:POKES+4,33:FORT=ITODR:NEXT
100 POKES+4,32:FORT=ITO50:NEXT
110 GOTO70
120 V=53248:POKEY+21,7
130 REM*****
140 REM* SPRITES' INITIALISATION *
150 REM*****
160 FORA=12288TO12350:READX:POKER,X:NEXT
170 FORB=12352TO12414:READY:POKEB,Y:NEXT
180 FORC=12416TO12478:READZ:POKEC,Z:NEXT
200 POKE2040,192:POKE2041,193:POKE2042,194:RETURN
210 REM*****
220 REM* SOUND'S DATA *
230 REM*****
240 DATA25,177,250,28,214,250,25,177,250,25,177,
    250,25,177,125,28,214,125
250 DATA32,94,250,25,177,250,28,214,250,19,
    63,250,19,63,250,19,63,250
260 DATA21,154,63,24,63,63,25,177,250,24,63,125,19,
    63,250,-1,-1,-1
270 REM*****
280 REM* SPRITE 1 *
290 REM*****
300 DATA0,0,0,0,0,0,0,0,0,56,0,0,126,0,0,126,0,24,
    215,24,60,195,60
310 DATA60,195,60,63,231,252,27,231,216,24,195,24,24,
    255,24,0,255,0,0,126,0
320 DATA0,56,0,0,24,0,0,24,0,0,24,0,0,0,0,0,0,0
330 REM*****
340 REM* SPRITE 2 *
350 REM*****
360 DATA0,24,0,0,126,0,0,255,0,0,153,0,0,255,0,0,
    66,0,0,126,0,0,24,0,0,255,0
370 DATA7,255,224,14,255,112,14,255,112,28,255,56,
    28,255,56,0,231,0,0,231,0
380 DATA0,231,0,0,231,0,0,231,0,3,231,192,0,0,0
390 REM*****
400 REM* SPRITE 3 *
410 REM*****
420 DATA0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
    0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
430 DATA255,255,255,255,255,255,255,255,255,255,
    255,255,255,255,255,255
440 DATA255,255,255,255,255,255,255,255,255
450 REM*****
460 REM* INSTRUCTIONS *
470 REM*****

```



```

479 PRINT "J"
480 POKE53280,11:POKE53281,15
484 PRINT "J"
490 PRINTTAB(96)"THE WALL"
500 PRINT"*****THE OBJECTIVE IS TO BUILD"
510 PRINT"*****A WALL OF BRICKS*"
520 PRINT"*****WITHOUT BEING KILLED"
530 PRINT"*****BY THE ANGRY ALIEN*"
540 PRINT"*****PUT THE FIRST BRICK ON"
550 PRINT"*****THE ARROW, AND THEN"
560 PRINT"*****THE LAST ARROW"
561 REM*****
562 REM* READING OF THE SOUND'S DAT. *
563 REM*****
565 PRINT"*****YOU HAVE A TIME OF TWO MINUTES*"
566 PRINT"*****TO PUT ONE BRICK!!*"
570 GOSUB50
571 REM*****
572 REM* READING OF THE SPRITES DAT. *
573 REM*****
580 GOSUB130
590 FORR=1TO1000:NEXT
600 PRINT "J"
610 PRINT"*****POINTS' BOARD :*"
630 PRINT"X1: A PUT BRICK = 100 PTS"
640 PRINT"X2: A BUILT WALL =1000 PTS"
650 PRINT
660 FORV=0TO39:PRINT"-":NEXT
670 PRINT
680 PRINT"X/A' TO ASCEND"
690 PRINT"X/Z' TO DESCEND"
700 PRINT"X/H' TO GO LEFT"
710 PRINT"X/M' TO GO RIGHT"
720 RESTORE
740 GOSUB50
750 FORR=1TO1000:NEXT
760 GOSUB130
770 VI=3:SC=0:TI#="000000"
780 REM*****
790 REM* START OF THE GAME *
800 REM*****
810 POKE53280,246:POKE53281,15
815 POKE53248+21,7
820 F=INT(RND(1)*255)+24:G=180
821 IFF>255THEN820
830 PRINT "J":GH=99
840 *****
841 * INITIALISATION OF THE VARIABLES *
842 *****
850 POKE2040,192:POKE2041,193:POKE2042,194
860 S1=0
870 L=INT(RND(1)*255)+24
871 TI#="000000"
875 A1=1
880 IFL>255THEN870
890 M=INT(RND(1)*130)+40
900 IFM>255THEN890
910 V=53248:POKEV+4,L:POKEV+5,M
940 K=0
950 H=INT(RND(1)*255)+24
951 IFF>255THEN950
959 FORP=1TO30
960 PRINT "8"
965 D#="LEFT$(TI#,2):B#="MID$(TI#,3,2):C#="RIGHT$(TI#,2)
970 PRINT"X2SCORE=#":SC:"X1LIFE=#":VI
971 PRINT"*****":D#:"X2LIFE":B#:"X1LIFE":C#:"X2SEC"
980 FORR=0TO39:PRINT"-":NEXT
981 PRINT "8"
982 IFFV<23ANDFX#S1-3ANDFX<C1+3ANDA1=10THEN1999
985 FORU=1TO19:PRINT
986 IFU=19THENFORV=1TOS1:PRINT"X-#":NEXT
987 NEXT
990 POKEV+2,F:POKEV+3,G
995 IFF>255THENK=255
1000 POKEV,H:POKEV+1,K
1002 POKEV+39,0:POKEV+40,8:POKEV+41,2
1010 K=K+8
1011 H=H+5
1012 IFF>255THENH=255
1015 V=53248:POKEV+4,L:POKEV+5,M
1020 GETA#
1025 FX=INT(F/8):GX=INT(G/8)
1027 IFF0=1THENKD=GX:IFKD=3THENGH=0:PO=0
1028 A1=A1+1
1030 IFA#="A"THENG=G+4
1040 IFA#="Z"THENG=G+4
1050 IFA#="N"THENF=F+4
1060 IFA#="M"THENF=F+4
1067 IFFX<HX-1ANDFX<GX+1ANDKD<KX-1ANDKD<KX1
    THENSC=SC+50:GOTO870
1070 IFF>230THENG=230
1080 IFF<50THENG=50
1090 IFF>255THENF=255
1100 IFF<0THENF=0
1105 POKEV+2,F:POKEV+3,G
1106 IFF>LANDFCL+2<ANDG>MANDGCM+24THENL=FANDM=G:A1=10
1110 IFK=240THENK=0
1111 IFK=240THENH=INT(RND(1)*255)+24
1112 IFF>300THENH=300
1113 IFTI#>"000200"THEN4000
1114 IFK=240THEN950
1116 IFFX=F-3ANDHC=F+3ANDK=0-6ANDK<G+6THEN3000
1120 NEXTP
1130 GOTO950
1200 REM*****
1300 REM* PROGRAM FOR A PUT BRICK *
1400 REM*****
1999 S1=S1+4
2000 PRINT "8"
2001 FORU=1TO19:PRINT-NEXT
2002 FORN=1TOS1:PRINT"X-#":NEXT
2005 SC=SC+100
2006 IFS1=24THENPRINT "J":FORU=1TO19:PRINT:FORO=1TO30
    :PRINT "-":NEXT:NEXT:U=0
2007 IFS1=24THENS1=SC+1000:GOTO860
2008 GOTO870
3000 REM*****
3001 REM* COLLISION *
3002 REM*****
3010 V=54296:W=54276:A=54277:H=54273:L=54272
3011 POKE54276,0:POKE54277,0:POKE54272,0
    :POKE54296,0:POKE54273,0
3015 FORW1=150TO0STEP-6
3020 FORX=15TO0STEP-1:POKEV,X:POKEW,129:POKEA,
    15:POKEH,40:POKEL,200:POKEA+1,I
3025 NEXT
3026 NEXTW1
3030 POKEW,0:POKEA,0
3040 VI=VI-1:RESTORE:GOSUB50
3045 IFFV<0THENGOTO5000
3050 GOTO870
3050 REM*****
3900 REM* OVERFLOW OF THE TIME *
3950 REM*****
4000 VI=VI-1:RESTORE:GOSUB50
4010 TI#="000000"
4020 IFTI#<0THEN5000
4030 GOTO870
4400 REM*****
4500 REM* END OF THE PROGRAM *
4600 REM*****
5000 POKEV+21,0
5001 FORF=1TO16:POKE53280,F:FORK=1TO2T300:NEXT
    :NEXT:POKE53280,246
5002 PRINT"*****YOUR SCORE IS :*"
5003 PRINT"*****":SC:"PTS."
5004 IFFSC>HISCTHENPRINT"X-#YOU'VE DONE THE HIGH
    SCORE.WELL DONE!!":GOTO5010
5005 PRINT"*****THE HI-SCORE IS :","X-#":HISC:"PTS."
5007 PRINT"X-#!!!!COURAGE!!!!!"
5010 FORT6=1TO1000:NEXT
5020 PRINT "J"
5030 PRINT"WOULD YOU LIKE ANOTHER PLAY (Y-N) ?"
5040 GETS#
5050 IFS#="N"THENEND
5060 IFS#="Y"THEN5100
5070 GOTO5040
5100 PRINTPRINT"WOULD YOU LIKE READ
    THE INSTRUCTIONS (Y-N) ?"
5200 GETG#
5210 IFG#=""THEN5210
5220 IFG#="Y"THENPRINT "J":GOTO1
5230 IFG#="N"THENGOTO780
5240 GOTO5210
5250 END

```


CAMBRIDGE COMPUTING

NEW

PRESENT

THE INTELLIGENT PRINTER INTERFACE

£45

THE INTELLIGENT JOYSTICK INTERFACE

£22-95

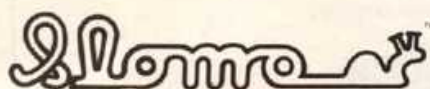
with joystick **£29-95**

- Compatible with **ALL** Centronics Printers and Plotters.
- Recognises **LLIST** and **LPRINT**.
- Recognises **COPY** to produce screen dumps on any graphics printer — in up to six sizes and three styles, including grey scale, shading and colour (subject to printer capability).
- Down loadable user definable character set to allow widest possible range of print styles.
- Software is in **ROM**, so does not need to be loaded from tape every time the interface is used. The special software allows the interface to recognise the functions of the printer in use and allows the style of printing or copying to be easily altered.
- Changing from one printer to another is readily accomplished by a quick and easy-to-use menu programme.
- All inclusive price of **£45.00**.

- Interface.** Easy to program.
- 1K on board memory.
 - Own rear edge connector.
 - Compatible with all standard joysticks.
 - Now Microdrive compatible

- Joystick** Self centring.
- 8 directional microswitched action.
 - 2 independent fire buttons.
 - Standard 9 pin D connector.

- Tape** Easy to use program enables the interface to work on **ALL** software
- Keeps a record of all your games — so you only need to program it for each game once!



£14-95

a Nidd Valley Micro Product
manufactured and distributed by



NEW



NEW

EXTENDER BAR with RE-SET BUTTON

LOW PRICE

£4-95

GAMES CONTROL Enables high speed games to be learned at slow speed with gradual increases with ability — Freeze frame at will when the going gets "hot". — Ideal for younger children or those with slower reactions as game speed can be set to enable rewarding results.

BUSINESS & SOFTWARE DEVELOPMENT Invaluable tool for software development where formation of graphics at slow speed aids de-bugging and perfection.

EDUCATION PROGRAMS Simplicity in phasing program speed and hold points to suit lecture or special emphasis. Infinite advantages for many educational applications.

EASY INSTALLATION (Simply plugs into the micro user port.) Available for Sinclair Spectrum, BBC A & B, Electron, VIC 20, CBM 64.

- Extender bar, incorporating a reset button which resets the computer without having to remove the power lead.
- Invaluable for recovery from micro drive crashes and machine code lockups.
- Useful to those with additional keyboards for fitting peripherals.

World patents pending

Trade enquiries welcome

Tel: 0223-214451

To: Cambridge Computing Research Limited, 61 Ditton Walk, Cambridge CB5 8QD

Please supply me with

TOTALS

- ☐ Printer Interface(s) at £45.00 each
- ☐ Joystick Interface & Joystick at £29.95 each
- ☐ Joystick Interface(s) at £22.95 each
- ☐ Joystick(s) only at £7.90 each
- ☐ Extender Bar with reset button at £4.95 each

Grand Total

enclose cheque/P.O. made payable to: Cambridge Computing
or I wish to pay by Access. My card No. is:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

PCW

Signature

To Cambridge Computing Research Ltd, 61 Ditton Walk
Cambridge CB5 8QD

Please supply me with

- ☐ Slomo Screen Controller(s) at £14.95 each
- for Spectrum/BBC/Electron/Vic20/CBM64

Total

I enclose a cheque/P.O made payable to
Nidd Valley Micro Products Ltd or I wish to pay by Access, my
card No is

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Signature

Olympia mania

Christina Erskine finds out what's new at the Personal Computer World Show.

The seventh Personal Computer World Show opened its doors on September 19th at its new Olympia venue. Though the show was a little smaller than last year it is nicely timed for the autumn launches, and it is still the show that no-one quite dares to miss.

All the established hardware manufacturers were there—Sinclair, Commodore, Amstrad, Acorn, Act and even Enterprise, which must count as established by now, despite still not having a product in the shops.

The Enterprise 64K computer was on display, though the promised software and peripherals (joystick and monitor) were hardly in abundance. The Enterprise is now priced at £249.00. At its last launch in March, it was intended to be £228.85.

The highlight of the show as far as new machines were concerned was surely the unveiling of the Acorn Business Computer range.

Still no price details available for the computers, but they range from the Terminal, intended as a machine to give Econet access and a terminal emulator, through the Personal Assistant, with View word processor bundled, to the ABC 310, with an 80286 main processor and up to 1 megabyte memory.

Commodore was showing its C16 and the Plus/4, the latter in a low-key way, and Sinclair were selling QLs from the stand. Sales could well have been enhanced by the sight of Psion's '3D' Chess program running on the machine, a sophisticated chess simulation which won the World Microcomputer Chess Championship two weeks ago.

Sinclair was also showing a £199 dedicated QL monitor, the Sinclair Vision, manufactured by MBM Data efficiency.

Commodore's new networking system, Compunet, was also much in evidence, and Century Communications announced that it would be putting Essex University's Multi-User Dungeon (MUD) on to Compunet. From October 1. Commodore also showed a primitive music keyboard add-on which clipped onto the C64 and acted directly on to the computer's keys.

Conspicuous by their absence were the MSX companies, which, with one exception, did not exhibit, for reasons best known to themselves. Those people who wanted to see MSX machines could find them by discovering which software houses were launching MSX programs—of which more later. Toshiba's HX-10 and the Sony Hit-Bit were both on show demonstrating MSX software.

The one MSX exception was AVT Golds-

tar's machine, being displayed and demonstrated by its distributors, Micro Dealer UK.

Amstrad's eagerly awaited 3inch Hitachi standard disc drive and interface (see page 5) was shown, if only partly, since most of it was buried in the back of the stand—"We've had to take some precautions—people do walk off with things from shows," explained Amsoft's Bill Poel.

The disc drive will enable users to run CP/M, Digital Research's Dr. Logo is also bundled with it costing £199.00, it should be available in November.

Whatever Atari UK do bring out under the guidance of new chairman Jack Tramiel, it won't be for this Christmas. Nothing new was shown on the stand, which publicised heavily the recent price cuts for both software (games now £9.99) and hardware (800XL is now £199.99).

Together for the first time—Hermann Hauser of Acorn (left) and Sinclair's Nigel Searle.



Most of the larger hardware companies were exhibiting on the ground floor, but up on Level One—which was devoted to business systems—Act's micros made strong display. The F1, F1e, and Portable all made their first public appearances alongside Apricot's more established machines.

Three hardware manufacturers were to be found on the second floor, where most of the home software companies had stands. Memotech had their machines on display—the 32K MTX500 is now £199.00 and the 64K MTX512 £275.00. A wide range of peripherals were also on view.

Oric's stand was notable for its vastness. The Atmos, disc drive, printer and modem were all shown. The last-named however, was not plugged in, and interested visitors to the stand had to be content with gazing at the little black box.

Touchmaster, the company made up of ex-Dragon Data employees and based at its South Wales site, were there in force, showing the Touchmaster graphics tablet,

and a variety of graphics tablet programs in the form of overlays for the keypads including early-learning titles and versions of board games such as *Draughts* and *Othello*. The Touchmaster keypad costs £149.00 and the 'Touchware' £9.99 each. The Touchmaster can interface with the Commodore 64, Vic 20, Dragon, Spectrum and BBC machines.

Rotronics' Spectrum Wafadrive was also being demonstrated, and Audiogenic showed for the first time a similar device for the Commodore 64. At £79.95, or £100 with Audiogenic's *Swift*, *Wordcraft* and *Maggie* packages bundled, the drive, manufactured in Canada, plugs into the Commodore's cassette port. The price undercuts Rotronics' forthcoming Commodore version by some £60.

Apart from its microcomputer, the BBC also had a heavy presence with *The Chip Shop*. Recordings for broadcast on the Radio 4 show were heard on the first three days of the show.

The first day had Paul Bailey (Digital Research) Roger Foster (Act) Hermann Hauser (Acorn) and Nigel Searle (Sinclair) cheerfully tackling audience questions and light-heartedly parrying with each other.

All for were happy to agree that the MSX

standard was very much a Lowest Common Denominator in the micro world—well they would, wouldn't they?—but were far more guarded when asked their opinions of the new Acorn business micros. Hermann Hauser was excused from answering this question.

Paul Bailey was openly appreciative and said they were 'very exciting'—Roger Foster felt that "Acorn will have as much difficulty breaking into the business market as Act would in the home market." It was left to Nigel Searle to openly admit any rivalry and he said, 'I wish Acorn luck with them, but I won't say if that's good or bad luck.'

The new software was mainly to be found on the second floor, and on emerging at the top of the stairs, it was impossible not to realise that *someone* had acquired the licence to market *Ghostbusters* as a computers game. On following the sound of the film's theme music, it turned out to be Strangely, it was a first meeting for any of the participants.

continued over the page ▶

Competition

Learn to Fly Competition: Week 4

FLIGHT SIMULATOR. To win a chance to try your hand on a real flight simulator — as used by British Airways to train commercial pilots — all you have to do is send off this 'plane' coupon No 4, together with the three coupons from the three previous issues of *PCW* and complete the form below. Send the whole lot off to: 'Flight Competition', Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

The winner will be the person who thinks up the best reason for wanting to fly — the judges decision is final and the competition is only open to residents of the UK and Eire. The competition closes on October 31.

Name
Address

I would like to learn to fly because (please complete in less than ten words)

HEWSON CONSULTANTS discount flight simulation and air traffic control software. To buy the special offer software at exclusive *Popular Computing Weekly* prices all you have to do is send off the Number 4 coupon below together with the three similar voucher from the previous three issues of *PCW*. Also enclose the completed panel on the left and a cheque or PO made payable to Hewson Consultants for the appropriate amount. Don't forget to tick which item of software you want and also write your name and address on *both* forms — they will be used to send your goods to you so please write legibly. You may only claim one discount software title per set of four vouchers. The offer is only open to residents of the UK and Eire and the offer closes on October 31. Please allow 28 days for delivery.

Program	RRP	PCW Tick price box
Nightflite II	£7.95	£5.50 <input type="checkbox"/>
Heathrow Air Traffic Control	£7.95	£5.50 <input type="checkbox"/>
Heathrow Air Traffic Control	£7.95	£5.50 <input type="checkbox"/>
Dragonfly II	£6.95	£4.75 <input type="checkbox"/>
Electron	£7.95	£5.50 <input type="checkbox"/>

Name
Address

Name
Address

4



4

Show report

continued from page 13

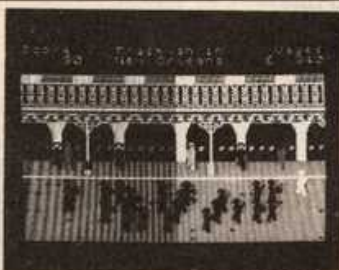
Activision (see page 5) who played the song relentlessly throughout the show. One representative on the stand was moved to remark that here was one record she'd be quite happy never to hear again.

MSX games were demonstrated by, among others, Hudsonsoft, who came to the show all the way from Japan. It had 14 such titles on show, including *Stop the Express*, which has already had some success on the Spectrum. The title was also shown on the C64. Most of its other MSX titles were conventional arcade action but there was also a *Mah-jong* simulation.

Thorn EMI showed a range of licensed MSX titles, including *Ant Attack*, *Boogaboo*, and *Games Designer* (Quicksilver) *Hustler* (Bubble Bus) and *Les Flics* (PSS). Prices for the range vary, but are between £6 and £8.

A large crowd was continually present at Llamasoft's stand, where Minter was demonstrating *Ancipital* (£7.50), his latest woolly quadruped. This one is a satyr-like creature, half-human, half-goat, trapped in a maze. To get out, the creature must find and collect five key camels and five goats of Power. Wot, no llamas?

New Generation announced its sequel to the highly acclaimed *Trashman—Travels with Trashman*, and an intriguing looking game, *Cliffhanger*, set in the badlands of Arizona, and featuring permutations on that



Travels with Trashman

time-honoured theme of rolling a boulder off a cliff on to someone's head.

Cliffhanger is for Commodore 64 at £7.95, *Travels with Trashman* £5.95 for the Spectrum.

Beyond software had a batch of new releases on show, including the *Lords of Midnight* sequel, *Doomdark's Revenge* and *Ankh*, a fiendishly difficult looking game for the Commodore 64.

Mirrorsoft's menu-driven *Games Creator* for the Commodore 64 shouldn't provide any problems with difficulty. Anyone who can twiddle a joystick can begin developing aliens, heroes and maze configurations to play a variety of arcade-type games. Three different games are included in the package, which you can alter and modify to your heart's content.

Snooker player Steve Davis was the main attraction at the CDS stand, or at least, the game bearing his name was. *Steve Davis*

Snooker gives you the facility to control spin and speed on your shots. The program is to be launched next month on the Commodore 64, Spectrum and Amstrad, with versions for MSX, BBC and Electron to follow.

Level 9 had a couple of new adventures, *Return to Eden* and *The Saga of Erik the Viking*, the last an adaptation from Monty Python's Terry Jones's book. As Erik, you must rescue your family from evil dog fighters in a graphic adventure. *Return to Eden* is the follow-up to the very successful *Snowball*, also an adventure with graphics. *Erik* and *Return to Eden* will cost £9.95. The latter will be available for Amstrad, Commodore 64, BBC, Spectrum, Memotech, Oric 1, Lynx and Atari, while *Erik* will be released on BBC, C64 and Spectrum, with an Amstrad version to follow.

Another licensed program, *The Magic Roundabout* was being shown for the first time at CRL's (now CRL Group pic) stand. Billed as non-violent, the scenario involves Dougal (the yellow blob) trying to build a house of sugar cubes, thwarted by the other Magic Garden characters. £5.95 for the Spectrum.

If these were the highlights of the Show, then what of the low points?

Microvitec deserves a fairly hefty rebuke from the RSPCA for promoting its cub colour display monitors by having three live tiger cubs caged at their stand. Don't try and tell me they enjoyed the show.



AUTOMATA U.K. PRESENTS
YOURSELF
IAN DURY
JON PERTWEE
MEL CROUCHER
DONNA BAILEY
and FRANKIE HOWERD in

DEVS EX MACHINA

WRITTEN AND DIRECTED BY MEL CROUCHER
48K ZX SPECTRUM PROGRAM BY ANDREW STAGG

PLEASE USE THE AUTOMATA ORDER COUPON ON THE BACK COVER

Spreadsheet

Program Mini Office Price £5.95 **Micro BBC B Supplier** Database Publications, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY

The facilities provided in *Mini Office* cover all the standard business applications — word processor, database, spreadsheet and graphics programs. It seems sound to offer these as one package, and as such it pro-

vides a complete introduction to a business system. However, anyone intending to make serious use of a business system would be well

vised to study the market carefully and look at the facilities offered by each package before buying. This one would provide an excellent introduction to each kind of program, but could prove frustrating after a while because of its limitations. For example, the word processor does not allow for 'search and replace'; the database is a flat file of maximum 156 records.

In short I would prefer to save up for a more powerful version of each program. However, it represents good va-

ESCAPE...Always returns to this page.

f8.....Large letter editing mode.

f1.....Normal letter editing mode.

f2.....Typing speed in words/minute.

f3.....Print text file.

f4.....Copy on/off.

f5.....Set tab key.

f6.....Save text file.

f7.....Load text file.

f8.....Clear text file.

f9.....Page end marker.

vides a complete introduction to a business system.

However, anyone intending to make serious use of a business system would be well

lue for money if its limitations can be accepted.

Jan Watterson



Traditional

Program Eye of Bain Micro Spectrum 48K Price £5.95 **Supplier** Artic Computing Ltd, Main Street, Brandesburton, Driffield YO25 8RL.

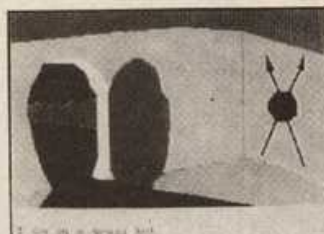
arl, the warrior, lies chained to a pole in a grass hut, his mission to find the priceless Eye of Bain cruelly interrupted by savage Alvanians. If only he could escape he could continue, but...

Actually it took this reviewer rather a long time to solve this first puzzle but eventually, with one verb/noun, he was free to roam through this, Artic's Adventure 'F'. Fans of its predecessors will not be disappointed. There are many locations spread around the native village, from tall trees with apes to deep wells with shapeless black beasts. To advance, or even survive, calls for careful

planning.

Author Simon Wadsworth has discarded 'Help' and 'Score' routines, but a useful system of capitals indicates which nouns are recognised.

Eye of Bain also illustrates its locations, and though this does not add materially, the pictures are nicely executed. Thankfully they only appear when cal-



led up, so do not slow down the fast responses to the text commands. In short this program makes no great innovations, but should please anybody looking for a traditional adventure.

John Minson



Addressed

Program Random Access Mailing Micro BBC B Price £34.99 **Supplier** Micro-Aid, 25 Fore Street, Praze, Cornwall.

Random Access Mailing from Micro-Aid is a flexible address filing system, its two main functions being the provision of label printing and letterhead addressing routines.

The main options offered by the menu-driven program consist of: data entry, deletion and alteration; list data; label and letterhead printing; and

data search and sort routines.

The data record consists of a name and address, telephone number, personal contact and record code option, this latter can be used to define a record as business or personal and can include codes to facilitate selective printing of labels etc. Searches and sorts may be performed using the address, telephone number code or contact name.

Thus, the program offers a considerable level of flexibility and control and is aimed therefore at those concerned with, for example, distribution of circulars, market researchers, mail-order operators etc — as well as the general office user,

Night Sky

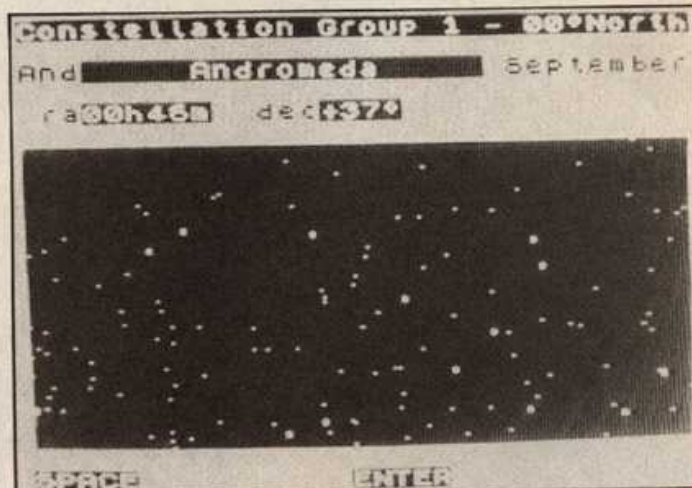
Program Star Watcher Micro Spectrum 48K Price £15.00 **Supplier** Brainpower, Triptych Publishing Limited, Sterling House, Station Road, Gerrards Cross, Bucks.

Application through learning is the philosophy of Brainpower, and this lavish package contains two cassettes, or one microdrive cartridge, devoted to educating and aiding the amateur astronomer.

Both programs are menu driven, with displays centred on a broad window in which the stars appear as single or multi-

for any place, at any time, with the application program. This can also simulate a planetarium, moving the heavens by step. A 54 page manual, sensibly designed to stand vertically by the screen, completes the pack. It is written for the beginner and explains the technicalities with admirable clarity.

Sadly, *Star Watcher* seems to have some surprising blemishes. Most entries have a Yes/No double check, but not the 'Exit Program' routine — where it is needed most. More important are discrepancies between the manual and program, including reference to a Teaching Module which is, apparently, not on the tape. If



pixel dots. The education section concentrates on constellation recognition, building up each from its key stars to a full sky picture. A test facility is provided.

The more experienced user can call up a celestial display

Triptych corrected these few faults they would have a versatile educational tool in which the contents, for once, matched the packaging quality.

John Minson



club secretaries, schools and so on.

It was with some sense of disappointment, therefore, that when running the program I viewed an almost immediate error message "Syntax error at Line 17010". Well, the origin of this was identified, and a point to mention is that if you possess a system operating Basic I, as opposed to the more recent version, you will have to alter the program *MAILrnd*. The modification is minor, changing the semi-colon following the *Inputtab* statement in Line 17010 to a comma (the Basic I equivalent) does the trick, then re-saving this *MAILrnd* or typing *Goto 10* in command mode should allow you to proceed.

The data entry routine took some getting used to, a rather constrained format is required to permit the program its level of complexity in the selective search, sort and print routines. The size of the data base is dependent upon the disc system available, 525, 1200, 925 and 1785 records on 40 track single density, 80 track single density, 40 track double density and 80 track double density

units, respectively.

In its label printing operation the program provides a very flexible system for configuring label printing to meet the individual's requirements and the formats of various printers. To print letterhead addresses the program is written in such a manner as to allow the address to be added to text-files created using *Wordwise*, in addition to standard blank paper headings. The program will in this option insert the address, date and name (defined as the personal contact) into the text where appropriate.

One peculiarity I found was that when printing an address, the personal contact name, if included in a record, was printed above the address. If the address record also included a name this gave rise to a double name preceding the address. Finally, the personal contact name is limited to twelve characters. Thus if you include a title and initial you are likely to get a severely truncated surname appearing.

Simon Wilson



High dive

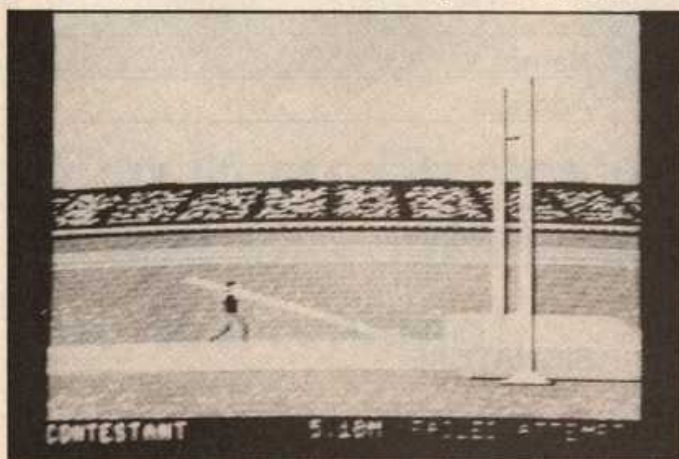
Program Summer Games Micro Commodore 64 **Price** £19.95 (disc) £14.95 (two cassettes) **Supplier** Quicksilver, Palmerston Park House, 13 Palmerston Road, Southampton, Hants.

Summer Games is another Track and Field variant in which you get to play every kind of sporting star known to mankind (the crowd only applauds if you are American

though).

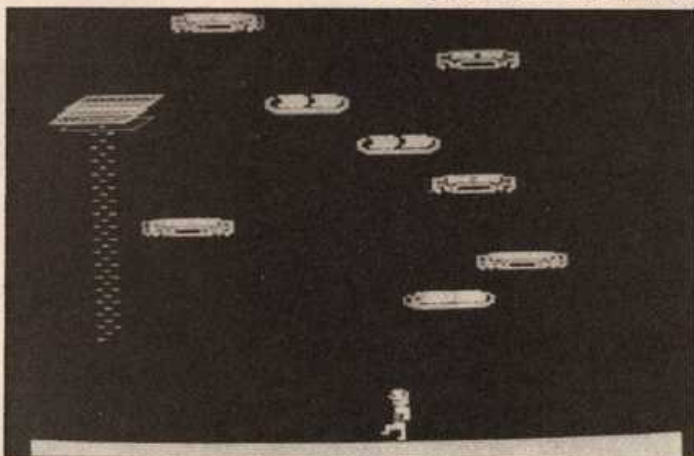
There can be little doubt though that despite the large number of similar titles this one is far and away the best.

It was written for the Commodore by the US house Epyx and is being marketed in this country by Quicksilver. The success of the game comes from its spectacular graphics. Unlike some of the other variants, this one introduces sports like high diving and gymnastics which require something other than the usual yanking of the joystick.



Psychedelic

Program Sinbad Price £7.95 **Micro** BBC B **Supplier** Virgin Games Ltd, Vernon Yard, 119 Portobello Road, London W11.



Quite what Sinbad and a cast of magic carpets are doing in space I cannot imagine, but there they are, and the scenario makes for an original game by Dennis Ibbotson. According to the cassette cover, he has only been programming for six months and hates computer magazines (whoops!).

It contains two different screens which alternate and become progressively harder during the game. The first has a number of furry rugs flying around the screen, and Sinbad has to climb on to his magic carpet and touch them as he

flies past. A touch changes their colour, although they are still able to knock Sinbad off the carpet, and frequently do so. The aim is to touch them all in as short a time as possible.

When Sinbad has completed his psychedelic experience,

the second screen appears — a 3D view of Sinbad flying through meteors. Sinbad's instant dyeing technique evidently doesn't extend to meteors, so he must avoid colliding with them. The length of time it took to clear the first screen determines how long the flight through the meteors will last.

The cover also promises a surprise reward at the end of the game, but that would be telling. The game is pleasant but unexciting.

Jan Watterson



There are various permutations of play available with up to eight players including the computer taking part if you wish. You can practise individual events and, if appropriate and you have a disc, record your world record score.

There is even an opening

ceremony in which a runner arrives to light the Olympic flame and white doves of peace are released — no sign of Ronald Reagan or a jetman though.

Ian Waltham



Glued-on

Program Poster Paster Micro Commodore 64 **Price** £6.95 **Supplier** Task Set, 13 High Street, Bridlington, Yorks.

Despite having a hero named Bill Stickers — a bad enough pun to be truly offensive — Task Set's new game *Poster Paster* is pretty good.

The simple idea is to move a

ladder about, collect glue, and put up posters avoiding a variety of completely unrelated but entertaining monsters. What makes the game is the realistic way the poster sections unfold to display various ludicrous adverts.

Beyond dodging monsters and positioning ladders there isn't much else to the game and it might get tedious after a while.

Ian Waltham



DRAGON SMASH SALE!

NOW! Dragon hardware at a fraction of the original price look at these great offers:-

DEAL 1) Dragon 64 + Single Disk + Flex O/S + Editor
+ Assembler + Disk Basic **£399.99 incl.**

DEAL 2) Dragon 64 + Single Disk + OS/9 **£399.99 incl.**

DEAL 3) Dragon 64 + Twin Disk + Flex O/S + Editor
+ Assembler + Disk Basic **£499.99 incl.**

DEAL 4) Dragon 64 + Twin Disk + OS/9 **£499.99 incl.**

PLUS WE WILL GIVE YOU £40.00 CREDIT IN PART EXCHANGE FOR YOUR WORKING DRAGON 32 AGAINST ANY OF THE ABOVE DEALS!

FULL RANGE OF SOFTWARE, PRINTERS AVAILABLE

Dragon Single Disk
Dragon Twin Disk
Dragon 64

£195.00 incl.
£295.00 incl.
£185.00 incl.

This offer is subject to availability

01-882-0681
01-882-6936

TO: Compusense Ltd., PO Box 169, Palmers Green London N15 5XA

Please supply	Deal 1 @ £399.99	
	Deal 2 @ £399.99	
	Deal 3 @ £499.99	
	Deal 4 @ £499.99	
	Total order value	

Name
Address
Tel (daytime)

CHARGE MY ACCESS/VISA NO. _____ **SIGNATURE** _____

Now YOU can go for gold ...with the



Fancy pitting yourself against the world's best at this summer's Olympics?

You can do so without going anywhere near Los Angeles — with the most challenging package of programs of 1984.

MICRO OLYMPICS is more than a game. It's a brilliantly written collection of ELEVEN track and field events.

And because we know we're going to sell many thousands of them we've brought the price right down — to just £5.95.

Ever imagined yourself as another Seb Coe? Then try to run against the world record holder at 1500 metres. And if that distance is too much for you then there's always the 100, 200, 400 and 800 metres to have a go at.

Not much good at running? Don't worry, MICRO OLYMPICS has many more challenges for you. Why not try your skill at the high jump or the long jump?

And if you can't beat the computer at running or jumping then you can always throw things around in frustration! The trouble is that it's just as hard to be a champion at the discus, the hammer or the javelin.

And the pole vault takes the event to new heights!

Yes, it's fast, furious fun, pitting yourself against the world's best times and distances on your micro.

You may not be another Steve Ovett or Alan Wells, but with practice you **COULD** become the Micro Olympics Champion!

Also available from WH Smith
and all other leading stores



**Play Micro Olympics
— and let your fingers
do the running!**

Send for it today

Please send me _____ copy/copies of
Micro Olympics at £5.95

☐ I enclose cheque made payable to
Database Publications Ltd.
for £ _____

☐ 48k Spectrum
☐ Commodore 64
☐ BBC 'B'
☐ Electron } £5.95
each

Please tick box

I wish to pay by ☐ Access ☐ Visa

No. _____ Expiry date _____

Signed _____

Name _____

Address _____

Post to: Micro Olympics offer, Database Publications,
68 Chester Road, Hazel Grove, Stockport SK7 5NY. PCW 9

The ABC trial

Jeff Naylor previews Acorn's new ABC range of business computers

Acorn's entry into the business machine market—the Acorn Business Computer (ABC)—launched at last week's Personal Computer World Show understandably attracted a great deal of attention.

Seven machines and a terminal-type model were demonstrated, all broadly based around the BBC-with-second-processor technology. At the bottom of the range the machines are provided with a Z80 second processor running CP/M. Other options use the 16032 running Xenix and the 80286 giving the ABC IBM PC compatibility.

So far, though, it is impossible to form a firm opinion about the ABC machines since Acorn is playing things close to its chest and has announced no details whatsoever of prices for the new range.

All the ABC models are based around the original BBC design (or Proton as it was called until the lucrative contract appeared). The machines come in two boxes, a main unit containing the discs, monitor, power supply and virtually all the electronics, and a separate keyboard. Whichever type of display—black and white or colour—the casing of the main unit appears to be identical.

It is quite large: the Apricot F1 and Macintosh look like half-scale models in comparison. Mounted on a plinth to raise it a few inches, the whole unit is supposed to tilt and swivel but when this was attempted on the pre-production machines it was not as easy as it looked. The ABC is not a light machine and only responded to brute force.

The disc drives are mounted beneath the screen. A Winchester hard disc presents you with a blank panel, broken only by a couple of LEDs. The floppy drives have a very solid lever for locking the discs in place. Acorn have taken great trouble in selecting a manufacturing source for these drives, and the type finally settled on have "passed all the tests with flying colours", to quote one of the designers. They are made by Teac, although nobody is supposed to know that.

The main circuit board for the ABC lies across the bottom of the case. The BBC circuit layout has been completely redesigned for the new series of machines, but the chips are the same. In terms of configuration, the ABC is a Model B BBC machine with Econet and disc interface. Compatibility was obviously the watch word of the design team. The new board has been designed to cope even with "dirty" programming tricks used by software authors on the BBC such as reconfiguring the display controller chip.

Where this compatibility may fail is with the disc operating system. It is no secret that the Acorn disc filing system is based around a controller chip that is now consi-

dered obsolete, even by its manufacturer. Consequently, the ABC computer is equipped with a new disc system which is bound to be an improvement, but may just cause the odd problem.

There are six, as opposed to five, side-ways Rom sockets, and these are capable of taking the 16K Roms or Eproms used on the BBC. A quick modification allows them to accept 32K chips instead. The main, or mother, board is standard throughout the range, except that I was left with the impression that the 300 series machines may have some alterations. Whether this is to do with running Concurrent CP/M or for the operation of mouse and modem was not clear.

Green-screen display

Either side of the monitor chassis—inside the case—are two card-holding frames: the second-processor boards and other additions are housed here. Space has also been left inside the case for the additional electromagnetic screening that is required by American interference regulations. This may limit the size of boards that third-party manufacturers can use. Cards for things such as Ram discs can be quite large so they may have to be plugged into the 1MHz bus and sulk around behind the machine.

The display section and power supply are housed in a pivoted frame: with the cover removed it may be hinged up to make servicing and modifications easy. In addi-

Acorn designer claimed that he can get into the machine in 15 seconds.

The monochrome machines have a 12-inch green-screen display that is both clear and steady. The colour tubes (12 inch again) are described as hi-resolution and high contrast: the pictures they produce can only be described as excellent. Returning to the outside of the case, there are both RGB and composite video sockets lurking around the back. The monochrome models produce colour signals, so I expect that their RGB outputs will be welcome to those who want colour but can't afford a hard disc as well. The video signals are not buffered, so plugging a second RGB monitor into a colour model may interfere with the built-in screen's circuitry. With the monochrome models the same may happen with the composite video output, but in both cases it would not require a very complex add-on to overcome the problem.

The backs of all the machines have the same collection of input and output sockets. Prominent is the 1 MHz bus expansion connector. With this you may add external devices, such as your own hard disc drive. Econet comes as standard, as do serial and parallel ports and an analogue socket. A tape socket indicates that a cassette interface is still provided, despite the fact that all the models are equipped with discs. This is not surprising, considering the origins of the design and compatibility aspirations with the Beeb computer, but please take note, Sinclair Research.

In addition there is a power switch and keyboard connector. This last item is a locking "D"-type socket, so the keyboard should never come adrift accidentally.

Running between the main unit and the



tion, the computer can actually continue to run in this position as no jumper leads need to be disconnected, so you will have the chance to give yourself all the electric shocks you want.

Getting into the machine to work on it is something that has been well thought out: an

keyboard is a curly, 18-way wire. Acorn were pleased to find that British Telecom used such an item, and put it to good use. The extension signals to the keyboard are buffered, but otherwise they follow the same format as the Beeb. The keyboard itself contains only a little electronics. The

Hardware preview



unit is slim and stylish and much thought has gone into the layout. The function keys are in a row along the top, but have been grouped in three blocks. It was thought that finding the right key would be made easier if they were grouped with gaps between F2 and 3 and F6 and 7.

BBC users will not find the cursor keys where they would expect, as they are grouped top right of the main Qwerty layout. Further right is a key-pad that not only contains numbers but also Plus, Minus, Divide and Multiply as well as an extra, double-sized return key. The keyboard gave a decidedly professional impression, and you get the same unit whatever model you buy.

A program break

There is no break key visible, a good idea for a computer that may spend little of its working life having programs written and debugged on it. If you peek at the back of the keyboard, however, a hole is revealed that fingers will have difficulty penetrating: poking a pencil in here will cause a break of the program (not the pencil). There is another switch behind the keyboard which can be used to toggle the way the machine operates. You can switch the second processor in and out (if fitted) and all that entails; if the Tube LED is not lit then you are left with a standard machine—however much you paid for it.

Having looked at the hardware components, let's now turn to the various options available. At the very bottom of the range is a machine that isn't really an ABC, but a terminal. At present it even has a 14 inch screen. Of interest to potential network customers, it is the least up-gradable of the range. Next comes the Personal Assistant. If you are considering buying a BBC machine with disc drive for word processing then hang on until the price of this model is announced—I am told that they will be

comparable, and with the Personal Assistant you are getting a much better product. It will be capable of running any BBC or Electron software (given that a disc filing problem does not emerge). In addition to a double-sided, double-density disc drive capable of storing 670K, you also get *View*,

Acorn's own word-processing package and *ViewSheet*, a spreadsheet. Both programs are in sideways Rom.

The other machines in the range can all be turned into this base model with the switch described earlier, although they will have better disc options and will not have the sideways Roms as standard.

The ABC 100 is the monochrome Z80 second-processor option with twin floppy drives (1480K total capacity). It uses the second-processor method as used on the Beeb, with the 6502 handling screen, keyboard, etc and the Z80 doing the clever stuff. The processors communicate via the same Tube interface as used on BBC. The ABC 110 is a 100 with a colour display and hard, 10 Mbyte, disc replacing one floppy. Both Z80 machines can handle CP/M and come with a full set of bundled software.

The ABC 200 series use the National Semiconductor 32016 chip as the second processor. This is an advanced chip—32 bits internally with 16-bit data and 24-bit address busses. The 200s are best described as technical work stations, as they support a wide range of languages including C and Pascal. Acorn hope to equip the colour and hard disc option, the ABC 210, with the Xenix operating system. The licences have

yet to be obtained for some of the software.

Finally the 80286 second-processor of the ABC 300 and 310 models is compatible with the 8086 and 8088 CPUs used by the IBM PC and its various clones. Proudly described as "not a PC compatible machine, a PC eater", the 300s are the executive machines, with a Concurrent (ie, multi-tasking) operating system and a software user interface called the *Desk Top Manager*. The front end of the Apple Liza and Macintosh are the obvious inspirations for the *Desk Top Manager* Graphic representation of sheets of paper overlapping on a desk, a mouse pointing at icons, and pull-down menus.

Whichever of the popular operating systems you may already be using, the 300s should cope: they can read virtually any disc format, although this may require some programming skills. The price of the 300s is claimed to under-cut the cost of equivalent IBM pc systems at around £3,500.

Pull-down menus

Perhaps the most interesting of the ideas behind the ABC is the possibility of upgrading from the lower end of the range to a top end machine. It should also be possible



to leave your old second processor in place when adding the next one up the range.

This would allow, for example, the CP/M Z80 option to remain in place when upgrading to the 200 specification.

The ABC range has been under development for about a year now and field trials began in May. The computers on display at the show were pre-production models, but production is due to start in November with deliveries in January.

Although Acorn has done a good deal of market research, it is not too late for dealer and public reaction to modify the final packages. It is the dealers who will have the most say in what ends up in the showrooms.

First impressions of the machines are favourable. It is not exactly an elegant machine, physically, but the power of twin processors cannot be dismissed. Until prices are known, though, it is difficult to compare the range with other products.

ANIROG

NICK-NICK!

P.C.
FUZZ



Aggro at closing time at the local. Getaway car screeches to a halt outside a bank. Ingenious methods employed by the Mafia to literally spirit away the loot from the High Street. Never fear - P.C. Fuzz is on patrol.

COMMODORE 64

£7.95

**Also available on
Disk at £9.95**

TRADE ENQUIRIES: ANIROG SOFTWARE LTD. 29 WEST HILL DARTFORD KENT (0322) 92513/8
MAIL ORDER: 8 HIGH STREET HORLEY SURREY 24 HOUR CREDIT CARD SALES HORLEY (02934) 6083
PAYMENT BY CHEQUE P.O. ACCESS/VISA 50p POSTAGE & PACKAGING

Pocket programs

Hardware Psion Organiser Price £99.95 **Supplier** Psion 22 Dorset Square, London NW1 1YP.

Even with the gilt now rapidly wearing off the home computer gingerbread, there still appears, once in a longish while, a product which bears the stamp of an original and very bright idea. Into that category comes the first piece of hardware produced by software company Psion. After several weeks of using the Psion Organiser I'm no longer breathless with admiration, but I am still a fan.

This machine makes an ambitious advertising claim to be "the world's first practical pocket computer", a slogan brazen enough to make several other manufacturers, not least Casio and Epson, foam at the mouth. The claim stems from the fact that with the Organiser, unlike any of the others so far on the market, large amounts (up to 16K in each of two "drives" or cartridge slots) of non-volatile memory are available for addresses and other reference data, including information for use with special "program packs" which come together with Psion's own programming language.

For the basic £99.95 you get the computer, complete with built-in operating system, and 14K of RAM, 16 character scrolling LCD display, alpha-numeric keyboard with a sophisticated calculator (including a built-in clock) two cartridges including a blank 8K unit for data.

The blank cartridges, called "datapaks" coming in 8K or 16K form, are *Eproms*. Information saved to them is thus preserved even when the machine is switched off. Equally it has to be remembered that once

data has been saved, using the special "save" key, that area of memory is committed unless the entire cartridge is reformatted.

The Organiser has a built-in database function, using the "find" key which will find any existing entries containing a specified string of characters. With a 16K *Eprom* full of information to sort through, I found the longest wait was about five seconds, and retrieval usually came very much faster. The scrolling screen, which can move forwards or back and, when using the "finance" pack, up and down as well, makes the most of the limited display.

Popl, standing for Psion Organiser Programming Language, bears some resemblance to a drastically curtailed version of BBC Basic. There are programs of up to 200 bytes. Numeric variables global and local are catered for as is *Goto* and a limited *IF* facility as well as a *Loop* command. The Finance Pack has built-in procedures for advanced mathematical and scientific calculations as well as more specialised tasks.

In general the Organiser is a user-friendly machine with the number of built-in commands simple enough to grasp and easily accessible. But, just as many of the advantages of the machine stem from its use of *Eproms*, so do the major drawbacks. I discovered these after I saved information about a company to the blank datapak and, a day later, remembered that there was

another office whose number I was also likely to need. But, once an entry has been saved, there is no way of adding to it without rewriting the whole entry and losing the



memory space of the original.

The "find" key will default to looking at cartridge 1 unless "2" is specified, and copying data from one datapak to the other is straightforward using the "save" key, if sometimes a little laborious.

The three 16K program packs, for maths, science and finance, cost £29.95 apiece and more are being developed, and there will also be a £39.95 RS232 interface to link the Organiser with a modem and transfer information to other computers or to connect it to a suitable printer.

All in all, a machine which, at the price, should find instant appeal in the executive market and, depending on the packs developed, could soon develop a wider appeal. When, that is, one ludicrous and glaring fault has been corrected. You won't believe it but, the damn clock loses up to 20 minutes per day.

Barbara Conway

A Sharpe

Hardware/Program Musicom ML-10 Centronics Interface/Musicom software Micro Spectrum plus Casio MT 200 music keyboard Price £43 (for the ML-10 unit) £9.95 (for the music software) **Supplier** Micro Musical, 37 Wood Lane, Shilton, Coventry CV7 9LA.

While back *PCW* looked at the Casio MT200 — a portable keyboard that could be linked with any micro that had, or could be fitted with, Centronics interface.

At the time all there was by way of software was whatever you could manage to create yourself using the grotty manual that came with the Casio PA 1 interface.

Micro Musical is a company that specialises in developing, with both hardware and software, computer-music links and it is from them that the first sensible software for

the MT 200 comes.

Its *Musicom* (minus points for naff name, *Micro Musical*) program enables you to enter, edit, repeat, and transpose music in up to eight parts and switch from any of the MT200's six rhythms and eight tone settings.

The notation for the music is not conventional dots and staves — although there is a promise of a music stave version in a couple of months. Instead, notes are referred to by letter and a number which determines which octave they fall in, eg, A2 is the lowest A the Casio can play. *Micro Musical* have replaced the ludicrous Casio system of using upper and lower-case letters for sharps and flats with a far more sensible + or -. For example, +A2 is A sharp.

However, it doesn't end there. If you use appropriate note values all the music can be automatically timed to the 'clock' that drives the rhythm unit — so you can't fail to be in time even if, as often happens, the beat doesn't quite fall where you thought.

It's easy to get the program to do something simple but if you want to get into some really nifty funky stuff using the disco setting you will have to do quite a bit of



experimenting with shortened notes and different rest lengths.

The only real problem with the package is that it is designed to work with a special Centronics interface *Micro Musical* have designed for the Spectrum called the ML 10 which cannot be used for ordinary printing purposes. Doubtless a lot of people out there will already have a Centronics interface and won't want to buy another.

The software may not work quite as straightforwardly with your particular interface, although *Micro Musical* are pretty helpful at sorting out such problems.

Graham Taylor

48K Spectrum

Different
adventure
with each
play!



UK & OVERSEAS TRADE ENQUIRIES VERY WELCOME

We dare you to visit our island of terror

"Avast ye swabs oi dares ye t'angle wi me treasure. shiver me timbers oi'll hoist yer from the yard arm."

If you think you have the ability to tread through the numerous terrors that await you to reach the treasure send off today for lolly Roger to:

Video Vault
140 High St West, Glossop, Derbyshire.

Complete coupon below and post off with
Cheque/PO or Quote Access No For £5.95
includes P/P

Access No.

--	--	--	--	--	--	--	--	--	--

Name _____

Address _____

Tel _____

a new series

All books written by Peter Gerrard, former editor of *Commodore Computing International*, author of two top-selling adventure games for the Commodore 64, or by Kevin Bergin. Both are regular contributors to *Personal Computer News*. Which *Micro?* and *Software Review*.

EXPLORING ADVENTURES

A complete look at the fabulous world of Adventure Games for your computer. Starting with an introduction to adventures, and their early history, it takes you gently through the basic programming necessary before you can start writing your own games. Inputting information, room mapping, movement, vocabulary, and everything required to write an adventure game are explored in detail. There follow a number of adventure scenarios, just to get started, and finally three complete listings written especially for your machine, which will send you off into wonderful worlds where almost anything can happen. The three games listed in each book are available on one cassette at £7.95. The complete guide to adventure games: playing, writing and solving them. Peter Gerrard is the author of Romik's two top-selling adventure games - Fools Gold and Tomb of Xeipos.

EXPLORING ADVENTURES ON THE COMMODORE 64	\$8.95
EXPLORING ADVENTURES ON THE VIC*	\$8.95
*Two of the games require 16K expansion and the third 32K	
EXPLORING ADVENTURES ON THE SPECTRUM 48K	\$8.95
EXPLORING ADVENTURES ON THE ORIC 48K	\$8.95
EXPLORING ADVENTURES ON THE DRAGON	\$8.95
EXPLORING ADVENTURES ON THE BBC Model B	\$8.95
EXPLORING ADVENTURES ON THE ELECTRON	\$8.95
EXPLORING ADVENTURES ON THE ATARI 48K	\$8.95

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

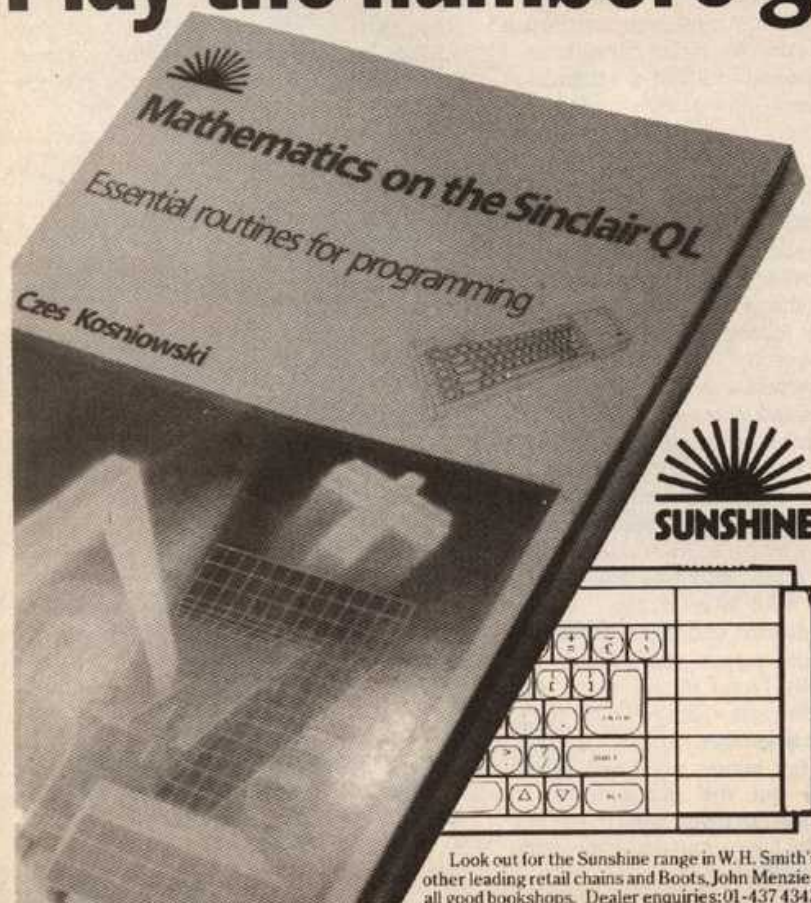
Write in for a descriptive leaflet (with details of cassettes)



DUCKWORTH

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

Play the numbers game on your QL.



Here's all the help you need to make sense – and good use – of all the mathematical utilities on your Sinclair QL. You can make good use of QL maths to ease the writing of particularly difficult programs. You can develop encryption routines, you can define probabilities, and produce statistical analyses.

Czes Kosniowski's new book, written specifically for the Sinclair QL and its powerful microprocessor, explains all these maths features. It illustrates how to use them to your best advantage, usually with short programs that you can easily adapt and slot into your own routines. You'll also discover all you need to know about random and prime numbers, about arrays and matrices and trigonometry and logic.

There's a great deal of valuable information in this Sunshine book, all written to aid you to get a great deal out of your QL. Order a copy today from your local bookshop or computer dealer, or complete and send the order form.

Please send me Mathematics on the Sinclair QL at £6.95 plus 50p p&p.

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

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

☐ Please charge my Visa/Access card No. _____

valid from _____ expires end: _____

Signed: _____

Name: _____

Address: _____

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

POPULAR COMPUTING WEEKLY

★ NOW AVAILABLE FOR THE AMSTRAD CPC 464!!
WIN THE POOLS?

SPECTADRAW 3 – THE LATEST VERSION OF THE ORIGINAL AND BEST POOLS PREDICTION PROGRAM FOR THE 48K ZX SPECTRUM!!

AND NOW... AMSTRA-DRAW – THE FIRST POOLS PREDICTION PROGRAM FOR THE AMAZING NEW AMSTRAD CPC 464!!



- Supplied with Database containing data on over 10,000 matches since 1980!
- You update the Database each week – but no tedious typing, as 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!
- Fully microdrive compatible! (Spectadraw only).
- Compatible with Currah Microspeech – the first pools program to read you its predictions! (Spectadraw only).

Spectadraw 3 for the 48K Spectrum.....£9.95 inclusive
 Amstra-Draw for the Amstrad CPC 464.....£9.95 inclusive
 (Cheques/P.O.s payable to B. S. McALLEY)

We dispatch every Monday with the database made up to include all matches up to the date of dispatch.

SPECTADRAW (Dept C), 1 Cowleaze, Chinnor, Oxford OX9 4TD.
 (Tel: 0844-52426)

LLAINLAN

the name on the best software

LATEST SPECTRUM RELEASES

B.M.X. TRIALS £6.95

Can you ride your BMX through the jungle? 15 screens (16k or 48k)

SPIDER ATTACK £6.95

Eat all the mushrooms before the spiders eat you! (48k)

GRAVE DOOM £6.95

Can you kill the ghosts before the bats kill you? (48k)

RUNAWAY TRAIN £6.95

You have to make tracks
 ALL MACHINE CODE AND THE FASTEST
 YOU'LL GET FOR THE SPECTRUM

SOUND EFFECTS £6.95

97 Machine code sound routines, a programing must (16k or 48k)

LEAGUE SECRETARY £6.95

Every football fan should have one (48k)

TROJAN LIGHT PENS

for SPECTRUM, COMMODORE only £14.95

RS232 LEADS

BROTHER COMPATIBLE only £12.95
 IMMEDIATE DELIVERY

LLAINLAN SOFTWARE
 FREEPOST, LLANELLI, DYFED, SA15 1ZZ
 Tel. no. 0269 871 158

ANSWER BACK SENIOR AND JUNIOR QUIZZES GENERAL KNOWLEDGE

THE ULTIMATE CHALLENGE

BBC (32K)•ELECTRON



Juniors (Ages 6 to 11)

-defeat the mythical dragon and save the princess of KOSMOS Castle...

Seniors (Ages 12 and Over)

-pit your wits against the KOSMOS robot and destroy the Alien invaders...

But be warned, in your endeavours you will learn vast amounts of fascinating facts on an enormous variety of subjects. The ANSWER BACK quizzes provide an incredible adventure in education by allowing successful challengers to participate in the compelling games.

Each program comes complete with 15 enormous quizzes providing a total of 750 questions and 3000 optional answers. But that is only the start, you can also create and save an unlimited number of quizzes of your own design.

FEATURES INCLUDE

- ☐ Multiple choice answers ☐ True or False? ☐ Find the missing letters
- ☐ "Pass" facility ☐ Immediate correction of errors ☐ Timer option
- ☐ Performance summary ☐ Re-run of questions passed or incorrectly answered ☐ Full facilities for creating and saving an unlimited number of new quizzes.

Available from your computer store or by mail order Price £10.95



Other educational titles include:
 "The French Mistress"
 "The German Master"
 "The Spanish Tutor"

KOSMOS SOFTWARE LTD, 1 Pilgrim Close, Harlington, DUNSTABLE, Beds. LU5 6LX

Please supply the following programs for the BBC/ELECTRON computer

ANSWER BACK Junior Quiz @ £10.95 ☐
 ANSWER BACK Senior Quiz @ £10.95 ☐

Mr/Mrs/Miss
 Address

Postcode



KOSMOS SOFTWARE LIMITED
 1 Pilgrim Close, Harlington
 DUNSTABLE, Beds. LU5 6LX
 Tel. (05255) 3942

Expand your attributes

Two new keywords for Interface 1 by B J Lowry

Any Spectrum Owner with Interface One will probably be aware of the Basic Extension facility the extra system variable *Vector* (Address 23735 & Address 23736) offers. Most Spectrum owners will also be aware of the lack of Basic commands to manipulate the attribute file, which at present can only be accessed via *Pokes* (hardly an aid to debugging) or via a *Print* statement, which can be inconvenient.

The following machine code program is a way of using Basic Extension to give a greater flexibility when manipulating the attribute file from Basic. The program defines two new Basic keywords:

a) **ATTR * I,P,C,L**

Where: *I* Ink (In the range 0-7)

P Paper (In the range 0-7)

C Column (In the range 0-31)

L Line (In the range 0-23)

b) **ATTR @ L,C,N,F,I,P**

Where: *L* Start line (In the range 0-23)

C Start column (In the range 0-31)

N No of Characters per line (In the

range 1-32)

F No of Lines duration (In the range 1-24)

I Ink (Range as before)

P Paper (Range as before)

Keyword *a* will allow the user to specify the ink and paper of any screen position (including the bottom status lines), without destroying anything printed there previously, by specifying the position in column/line co-ordinates.

Keyword *b* allows the user to define a rectangle of colour, of width *N* and length *F* that begins on Line *L* at column *C*, without destroying anything printed previously.

Although both new statements only act on the ink and paper, the user can incorporate *flash* and *bright*. This is done by preceding the new statement with a line that sets the *flash/bright* on, and then immediately after the new statement inserting a line that sets *flash/bright* off. The user is able to do this because both commands access the system variable *attr p* (address 23693) and pick up the flash and bright bits.

The machine code is 413 bytes long, and I have located it above Ramtop at starting address of FD8C (hex), 64860 (dec). For those of you without an Assembler, I have included a decimal dump of the code and a small Basic program to load this routine.

Enter the Basic loader and run it. The computer will ask you to input each number from the dump from left to right, eg, starting with 215 then 24 then 0 then 254 then 171. After five numbers the computer will display the sum (in the case of the first line 644). If the number agrees with the sum for that line on the printout, the line is ok and you can enter the next line. After entering the code it should be saved before testing. Save as: *Save "Name" Code 64860,413*. After saving the code, *New* the computer and enter Lines 10 and 11 of the example program. *Run* these lines, *Load* back the code previously saved, then enter the rest of the example program. When entered, the program can be run by typing *Goto 14*, and pressing *Enter*.

One thing must be noted when using the new commands. Do not forget to change the system variable *vector* before trying to use them. Simply *Poke 23735,92* and *Poke 23736,253* at the beginning of any program that uses the commands, and don't forget to load the code.

```
000000 Zeus Assembler Listing
000001 DATE: 17/06/84
000002
000003 Extending BASIC
000004 =====
000005
000006 (C) 1984 BJ LOWRY
000007
000008 ATTR*I,P,C,L
000009
000010 ATTR@L,C,N,F,I,P
000011
000012 ORG #FD8C
000013 SYN RST 16 ; Page ROM
000014 DEFU #0010 ; Get Char
000015 CP 171 ; Is it ATTR
000016 JP Z,ATS ; Yes, Jump
000017 JP #01F1 ; No, Error!
000018
000019 ATS RST 16 ; Page ROM
000020 DEFU #0020 ; Next Char
000021 CP 42 ; Is it 'a'?
000022 JP NZ,NXT ; No, Try 'e'
000023 RST 16 ; Page ROM
000024 DEFU #0020 ; Next Char
000025 RST 16 ; Page ROM
000026 DEFU #1C82 ; Get LINE
000027 CP 44 ; Comma?
000028 JR Z,SN1 ; Yes, Jump
000029 ER2 RST 32 ; NO, Error!
000030 DEFB 0 ; Nonsense in
000031 ; Basic-ERROR
000032 SN1 RST 16 ; Page ROM
000033 DEFU #0020 ; Next Char
000034 RST 16 ; Page ROM
000035 DEFU #1C82 ; Get COLUMN
000036 CP 44 ; Comma?
000037 JR NZ,ER2 ; No, Error
000038 RST 16 ; Page ROM
000039 DEFU #0020 ; Next Char
000040 RST 16 ; Page ROM
000041 DEFU #1C82 ; Get PAPER
000042 CP 44 ; Comma?
000043 JR NZ,ER2 ; No, Error!
000044 RST 16 ; Page ROM
000045 DEFU #0020 ; Next Char
000046 RST 16 ; Page ROM
000047 DEFU #1C82 ; Get INK
000048 CALL #05B7 ; Exit in
000049 ; Syntax Time
000050
000051 Run-time Module
000052
000053 ERN EQU #3600
000054 POS
000055 POS RST 16 ; Page ROM
000056 DEFU #1E94 ; Get Line n
000057 CP 24 ; Is it in
000058 JR NC,ER3 ; Range?
000059 LD BC,31 ; Initialise
000060 LD DE,0 ; the
000061 LD HL,0 ; Registers!
000062 LD E,A ; Save Line
000063 PUSH DE ; & incrm't
```

```
00065 PUSH BC ; before ROM
00066 RST 16 ; Page ROM
00067 DEFU #1E94 ; Get Column
00068 CP 32 ; Is it in
00069 JR NC,ER3 ; Range?
00070 POP BC ; Restore
00071 POP DE ; Line/Incr
00072 LD D,A ; Save Column
00073 LD HL,22528 ; ATR base
00074 LD A,0 ; ZEROiseCNT
00075 CALC CP E ; =Line n?
00076 JR Z,ENDC ; Yes, Jump
00077 INC A ; CNT=CNT+1
00078 ADC HL,BC ; Add Offset
00079 JR CALC ; Round Again
00080 ENDC LD C,D ; COL Offset
00081 LD B,0
00082 ADC HL,BC ; Add it in
00083
00084 ; Registers HL contain the
00085 ; address of the attribute
00086 ; byte to be changed
00087
00088 ; Now for PAPER & INK :-
00089
00090 COLS PUSH HL ; Save Addr
00091 RST 16 ; Page ROM
00092 DEFU #1E94 ; Get Paper
00093 CP 8 ; Is it in
00094 JR NC,ER4 ; Range?
00095 LD DE,0 ; ZEROise DE
00096 LD D,A ; Save Paper
00097 PUSH DE ; & Addr
00098 PUSH HL ; before ROM
00099 RST 16 ; Page ROM
00100 DEFU #1E94 ; Get Ink
00101 CP 8 ; Is it in
00102 JR NC,ER4 ; Range?
00103 POP HL ; Restore
00104 POP DE ; Paper/Addr
00105 LD E,A ; Save Ink
00106 LD BC,0 ; Initialise
00107 LD HL,0 ; Registers
00108 LD A,0 ; to ZERO
00109 SUM LD A,D ; Get PAPER
00110 RLCA ; Shift the
00111 RLCA ; Bits to
00112
00112 RLCA ; Get P*8
00113 ADD A,E ; Add in INK
00114 LD HL,23693 ; Add in
00115 LD E,A ; any
00116 LD A,(HL) ; Bright
00117 AND #C0 ; a Flash
00118 OR E ; Bits
00119 POP HL ; Get AtrAddr
00120 LD (HL),A ; Alter Attr
00121 JP #05C1 ; Finish
00122
00123 ;
00124 ER3 LD (Y+ERN),#0A
00125 RST 40
00126
00127 ;
00128 ER4 LD (Y+ERN),#13
```



```

00129 RST 40
00130 ;
00131 NXT CP 64 ; Is it 'e'
00132 JP NZ, ER2 ; No, Error 2
00133 RST 16 ; Page ROM
00134 DEFU #0020 ; Next Char
00135 RST 16 ; Page ROM
00136 DEFU #1C82 ; StartLINE
00137 CP 44 ; Comma?
00138 JP NZ, ER2 ; No, Error 2
00139 RST 16 ; Page ROM
00140 DEFU #0020 ; Next Char
00141 RST 16 ; Page ROM
00142 DEFU #1C82 ; Start COL
00143 CP 44 ; Comma?
00144 JP NZ, ER2 ; No, Error 2
00145 RST 16 ; Page ROM
00146 DEFU #0020 ; Next Char
00147 RST 16 ; Page ROM
00148 DEFU #1C82 ; N/O Chars
00149 CP 44 ; Comma?
00150 JP NZ, ER2 ; No, Error 2
00151 RST 16 ; Page ROM
00152 DEFU #0020 ; Next Char
00153 RST 16 ; Page ROM
00154 DEFU #1C82 ; EndLINE
00155 CP 44 ; Comma?
00156 JP NZ, ER2 ; No, Error 2
00157 RST 16 ; Page ROM
00158 DEFU #0020 ; Next Char
00159 RST 16 ; Page ROM
00160 DEFU #1C82 ; INK
00161 CP 44 ; Comma?
00162 JP NZ, ER2 ; No, Error 2
00163 RST 16 ; Page ROM
00164 DEFU #0020 ; Next Char
00165 RST 16 ; Page ROM
00166 DEFU #1C82 ; PAPER
00167 CALL #0567 ; SyntaxEND

```

```

00168 PAS RST 16 ; Page ROM
00169 DEFU #1E94 ; Get PAPER
00170 CP 6 ; In range?
00171 JR NC, ER4 ; No, Error
00172 LD B, A ; Store it
00173 PUSH BC ; Save it
00174 RST 16 ; Page ROM
00175 DEFU #1E94 ; Get INK
00176 CP 6 ; In range?
00177 JR NC, ER4 ; No, Error
00178 POP BC ; Get PAPER
00179 LD C, A ; Save INK
00180 PUSH BC ; and PAPER
00181 RST 16 ; Page ROM
00182 DEFU #1E94 ; EndLINE
00183 CP 25 ; In range?
00184 JR NC, ER3 ; No, Error
00185 LD D, A ; Store it
00186 PUSH DE ; Save it
00187 RST 16 ; Page ROM
00188 DEFU #1E94 ; N/O CHARS
00189 CP 33 ; In range?
00190 JR NC, ER3 ; No, Error
00191 POP DE ; EndLINE
00192 LD E, A ; Save EL &
00193 PUSH DE ; N/O CHARS
00194 RST 16 ; Page ROM
00195 DEFU #1E94 ; StartCOL
00196 CP 32 ; In range?
00197 JR NC, ER3 ; No, Error
00198 LD H, A ; Store it
00199 PUSH HL ; Save it
00200 RST 16 ; Page ROM
00201 DEFU #1E94 ; StartLINE
00202 CP 24 ; In range?
00203 JP NC, ER3 ; No, Error
00204 POP HL ; StartCOL
00205 LD L, A ; Save SL
00206 POP DE
00207 POP BC

```

```

00208 ; NOW THE REGISTERS CONTAIN

```

```

00210 H = Start Column
00211 L = Start Line
00212 E = End Line
00213 B = Number of Chars
00214 C = Paper
00215 C = Ink

```

```

00216 CALL CERRS ; ERRcheck
00217 PUSH BC ; Calculate
00218 PUSH DE ; the ATTR
00219 LD BC, 31 ; Start
00220 EX DE, HL ; Address
00221 LD HL, 22520
00222 LD A, 0
00223 CLC
00224 JR Z, EC1
00225 INC A
00226 ADC HL, BC
00227 JR CLC
00228 EC1 LD E, D
00229 LD D, 0
00230 ADC HL, DE
00231 ; HL = ATTR Start Addr
00232 POP DE
00233 POP BC
00234 PUSH DE
00235 PUSH HL
00236 LD A, B
00237 RLCA
00238 RLCA
00239 ADD A, C
00240 LD E, A
00241 LD A, (23693)
00242 AND BC0

```

```

00247 OR E
00248 LD (23695), A
00249 ;
00250 System Variable ATTR T
00251 contains New ATTR
00252 ;
00253 POP HL
00254 POP DE
00255 PUSH HL
00256 PUSH DE
00257 LD B, 1
00258 LD C, 0
00259 POP DE
00260 POP HL
00261 ;
00262 HL = BASE ADDRESS
00263 BC = END ADDRESS
00264 E = N/O CHARS
00265 ;
00266 LD D, 1
00267 AGN LD A, (23695)
00268 LD (HL), A
00269 LD A, D
00270 CP E
00271 JR Z, ELN
00272 INC HL
00273 INC D
00274 JR AGN
00275 ELN LD A, B
00276 CP C
00277 JR Z, FIN
00278 LD D, 1
00279 PUSH DE
00280 LD D, 0
00281 LD E, 32
00282 ADC HL, DE
00283 POP DE
00284 PUSH DE
00285 LD D, 0
00286 SBC HL, DE
00287 POP DE
00288 INC B
00289 JR AGN
00290 FIN JP #05C1
00291 CERRS PUSH DE
00292 PUSH BC
00293 PUSH HL
00294 PUSH AF
00295 LD A, H
00296 ADC A, E
00297 CP 34
00298 JP NC, ER3
00299 LD A, L
00300 ADD A, D
00301 CP 20
00302 JP NC, ER3
00303 POP AF
00304 POP HL
00305 POP BC
00306 POP DE
00307 RET

```

```

1 REM example program
2 REM using the new commands
3 REM
10 CLEAR 64059
11 POKE 23735, 92: POKE 23736, 2
53
12 REM run above before
   entering the rest
13 REM
14 PRINT AT 7,7: "A"
15 PRINT AT 1,0: "press a key":
   PAUSE 0
16 ATTR #6,5,7,7
17 PRINT "ATTR#"
18 PAUSE 0 CLS
20 PRINT AT 11,3: "a block of c
   colour": PRINT AT 1,0: "press a ke
   y": PAUSE 0
21 ATTR #10,2,20,7,2,1
22 PRINT "ATTR#"
23 PAUSE 0: CLS: PRINT AT 12,
   0: "with FLASH & BRIGHT": PAUSE 0
24 FLASH 1: BRIGHT 1
25 ATTR #12,0,32,1,2,7
26 FLASH 0: BRIGHT 0
27 STOP

```

```

1 REM BASIC LOADER
2 REM
10 CLEAR 64059: LET B=64059
20 DIM A(5)
100 LET C=1
110 INPUT "Byte>"; A
111 IF A<0 OR A>255 THEN PRINT
   "AT 0,5: "BAD BYTE!-ENTER AGAIN
   ": BEEP .5,-24: PAUSE 50: GO TO
   110
112 LET A(C)=A
113 PRINT A
114 LET C=C+1
115 IF C=5 THEN LET C=1: GO SUB
   200
120 IF B>B+415 THEN GO TO 1000
122 GO TO 110
200 LET SUM=0: FOR X=1 TO 5
210 LET SUM=SUM+A(X): NEXT X
211 PRINT "SUM="; SUM: "-IF OK
   PRESS 0, IF NOT, 1"
212 PAUSE 0
213 IF INKEY#="0" THEN GO SUB 3
   00
214 IF INKEY#="1" THEN PRINT #0
   , AT 0,0: "CANCELLED LAST LINE, ENT
   ER AGAIN": BEEP .5,-24: PAUSE 50

```

Continued over the page


```

RETURN
215 RETURN
300 FOR X=1 TO 5: POKE B+X,A(X)
NEXT X: LET B=B+5: PRINT "NEXT
LINE": RETURN
1000 CLS: PRINT "ALL THE MACH
THE CODE HAS BEEN ENTERED, PLEASE
SAVE BEFORE RUN-NING"
1001 PRINT: PRINT "SAVE A5":
PRINT "SAVE "+CHR$(34)+"NAME"+CHR
$(34)+"CODE 64660,413"
1002 STOP
    
```

DECIMAL DUMP

215	24	0	254	171	SUM	554
202	103	253	0	195	SUM	994
1	215	32	0	0	SUM	502
42	194	3	254	0	SUM	708
32	0	215	130	0	SUM	485
34	44	40	2	331	SUM	571
202	215	32	0	215	SUM	452
130	202	254	44	0	SUM	480
244	215	32	0	215	SUM	706
130	202	254	44	0	SUM	480
234	215	32	0	215	SUM	696
130	202	254	44	0	SUM	551
215	146	1	65	2	SUM	671
48	90	1	31	4	SUM	170
17	0	0	0	0	SUM	50
0	0	0	0	0	SUM	720
140	103	13	107	215	SUM	512
710	103	0	0	0	SUM	337
0	0	0	0	0	SUM	418
40	0	0	0	0	SUM	352
24	40	0	0	0	SUM	903
307	74	224	215	146	SUM	387
307	254	0	40	213	SUM	317
17	0	0	0	0	SUM	575
202	215	146	0	254	SUM	524
5	40	0	0	0	SUM	129
0	0	0	0	0	SUM	184
0	0	0	0	0	SUM	185
141	0	0	131	33	SUM	684
100	179	0	106	100	SUM	910
100	0	0	119	0	SUM	505
100	0	0	54	0	SUM	556
100	0	0	0	0	SUM	770
100	0	0	0	194	SUM	

121	253	215	32	0	SUM	621
215	130	202	254	44	SUM	671
194	121	254	215	32	SUM	816
0	215	130	202	254	SUM	627
44	194	121	254	215	SUM	826
32	0	215	130	202	SUM	405
254	44	194	121	254	SUM	857
215	32	0	215	130	SUM	592
202	254	44	194	121	SUM	641
215	32	0	215	130	SUM	716
130	202	254	44	194	SUM	650
101	254	215	32	0	SUM	622
130	202	254	44	194	SUM	761
215	130	202	254	44	SUM	652
215	146	1	65	2	SUM	499
46	175	71	197	0	SUM	655
215	146	30	254	0	SUM	655
40	168	193	79	197	SUM	683
215	146	30	254	215	SUM	672
40	161	87	213	215	SUM	714
140	30	254	32	40	SUM	513
140	209	05	213	215	SUM	874
140	30	254	32	40	SUM	512
130	202	254	44	194	SUM	827
30	254	24	215	146	SUM	875
130	202	254	44	194	SUM	863
202	254	111	215	197	SUM	1005
202	254	0	215	197	SUM	300
1	31	0	215	197	SUM	337
40	0	0	0	0	SUM	416
24	0	0	0	0	SUM	384
24	0	0	0	0	SUM	942
24	0	0	0	0	SUM	370
24	0	0	0	0	SUM	516
24	0	0	0	0	SUM	794
24	0	0	0	0	SUM	950
24	0	0	0	0	SUM	516
24	0	0	0	0	SUM	316
24	0	0	0	0	SUM	472
24	0	0	0	0	SUM	443
24	0	0	0	0	SUM	267
24	0	0	0	0	SUM	297
24	0	0	0	0	SUM	771
24	0	0	0	0	SUM	532
24	0	0	0	0	SUM	638
24	0	0	0	0	SUM	1808
24	0	0	0	0	SUM	886
24	0	0	0	0	SUM	787
24	0	0	0	0	SUM	1178
24	0	0	0	0	SUM	663

tír na nóg



GARGOYLE GAMES

48K ZX SPECTRUM



COURSEWINNER

The Punters Computer Program

COURSEWINNER allows you to use the power of your computer to get the edge on the bookmaker.

- COURSEWINNER contains a database full of detailed information on all English and Scottish flat courses. The ten leading jockeys and trainers, and effect of the draw is detailed for each course.

This information can be displayed on the screen at any time.

- The program analyses these factors combined with the results of the last three outings, starting price and weight carried.

- COURSEWINNER is simple and quick to use, yet very powerful.
- Boxed with detailed instruction booklet.

Price £12.50 all inclusive IMMEDIATE DISPATCH (RETURN OF POST)

Available for:

SPECTRUM (48K), BBC (B), COMMODORE 64, DRAGON, APPLE II/IIe, ATARI (48K).

POOLSWINNER

The Ultimate Pools Prediction Program

- POOLSWINNER is the most sophisticated pools prediction aid ever produced. It comes complete with its own massive database.

- Can be used for Scoredraws, Draws, Aways and Homes.
- The database contains over 20000 matches (10 years league football). It updates automatically as results come in.
- The precise prediction formula can be set by the user. This allows development of your own unique method.
- Package is complete with program, database and detailed instruction booklet.

Price £15.00 all inclusive IMMEDIATE DISPATCH (RETURN OF POST)

Available for: SPECTRUM (48K), ZX81 (16K), BBC (B), COMMODORE 64, DRAGON, APPLE II/IIe, ATARI (48K).

NOW ALSO FOR AMSTRAD CP464, IBM P.C.

Available from dealers or direct (return of post) from:



selec
SOFTWARE



37 Councillor Lane, Cheadle, Cheshire. Phone: 061-428 7425

POPULAR COMPUTING WEEKLY

WIN **£25,000** AND SAVE THE WORLD **Eureka!**™

250 K OF PURE MYSTERY BY IAN LIVINGSTONE

- 5 complete Adventures, each with its own Arcade, in one multi-load mega-program: "Eureka!" is the ultimate computer Epic.
- Epic in scale: "Eureka!" spans five eras of history! You battle against the dinosaurs, outwit Nero and his gladiators, join the Knights of the Round Table, escape from Colditz, and finally into 1984 defeat the evil master of the Caribbean who is holding the world to ransom.
- Epic in sheer size — there's more than 250K for you to get yourself killed in.

5 PROGRAMS IN ONE

- All 5 Adventures are linked — but you can choose to play them separately. And they all have REAL TIME built in. So if you don't think fast, you wind up as a pterodactyl's lunch, die of over-exertion in a Roman orgy, or just lose your mind...
- "Eureka!" is not just an Epic — not just an Adventure. At the start of each historical era, you face an Arcade Action test, to decide your strength level for the Adventure to come.
- The better your score, the stronger and faster you'll be.
- And it'll keep you on your toes, with constantly-changing, static and moving graphics. Brilliant music and sound effects add to the excitement.
- As part of the "Eureka!" pack, you receive a full-colour illustrated booklet, containing cryptic riddles and mysterious illustrations. Using booklet and screen together, you steadily unravel the clues and build up a secret phone number piece by piece.
- If you're first to ring it, you save the world and collect the £25,000!
- Quite a package! And to give everyone a fair chance, "Eureka!" will be released simultaneously worldwide on October 31st, 1984. No packs will be available until that date. All orders received by mail or phone by 26th OCTOBER will be despatched by post on the 31st right across the world. So order now, and be one of the first off the mark.

THEN THE RACE IS ON!!!

DEvised BY IAN LIVINGSTONE



The storylines for "Eureka!" are by Ian Livingstone, whose "Fighting Fantasy" books have sold over 2,000,000 copies. He's dreamed up some rather nasty tricks and twists for you in this Epic, because he has also devised the cryptic clues and conundrums in the booklet that goes with the program. He's the one who knows the answers.

"Eureka!" was programmed by Andromeda teams led by Hungarians Donat Kiss and András Császár. It took the equivalent of 5 YEARS to create, and the skills of 4 graphic artists, 2 musicians and a professor of logic too. We told them to stretch the hardware's capabilities, and make sure you were kept awake for hours!! They've done it...

£7 BONUS

When you order "EUREKA!" before 26 OCTOBER 1984, you receive an additional bonus: £7 voucher off the price of the TROJAN LIGHT PEN from PSL MARKETING. Normal price is \$17.25. You buy it for just \$10.25.

Spectrum 48K or
Commodore 64
(TurboLoad)

Full-colour booklet,
packed with cryptic
clues to help you
unravel the mystery —
and win the £25,000
reward

Music and
sound effects
built in

High quality,
full-colour, static and
moving graphics

Just clip the coupon. Or, for even faster action,
order by Credit Card on the
"Eureka!" Telephone Hotline 01-460 6000.

Eureka!™

Send your order now to:
"Eureka!", FREEPOST, Dept 400, Mount Farm, Milton Keynes, MK1 1HQ

NO STAMP NEEDED

To: "Eureka!", FREEPOST, Dept 400, Mount Farm, Milton Keynes, MK1 1HQ

Please send me "Eureka!" packs, complete with cassette, full-colour booklet, instructions and rules, at £14.95 each PLUS 50p post & packing. If my order is received before 26 October 1984, I will receive a free £7 voucher towards a Trojan light pen. Please allow 14 days delivery for orders received after 26 October.

MY COMPUTER IS	(Circle one)	total at £15.50
COMMODORE 64	<input type="checkbox"/>	
SPECTRUM 48K	<input type="checkbox"/>	
TOTAL £		

24 HOUR PHONE
HOTLINE NUMBER
01-460 6000
For Credit Card Orders

I enclose payment by cheque/PO, payable to DOMARK LTD.

OR Please charge my Credit Card ☐ VISA ☐ ACCESS ☐ AMEX ☐

Card Number:

Expiry Date: Date:

Name: Signature:

Street:

Town: Post Code: PCW

The race for the £25,000 starts on 31 Oct 1984 and closes on 31 Dec 1985.

SYSTEM 15000

THE REAL TIME GAME

BEAT IT!!

SYSTEM 15000 The different game with the **NEW "TOTAL REALISM"** concept developed by **AVS** sets you firmly in the middle of an International conspiracy where you have to use your computer together with **SYSTEM 15000** to recover **\$1,500,000**. The game is a 'real time' investigation that realistically captures the excitement of accessing computers by telephone and breaking their codes to obtain vital information.

AVAILABLE NOW — CBM 64-BBC B SPECTRUM 48k

Also available — The No. 1 chart success **FLIGHT ZERO-ONE FIVE (VIC20)** and the Helicopter Action Game — **WHIRLWIND ONE-FIVE (VIC 20)**

CRAIG COMMUNICATIONS

P.O. BOX 46 BASINGSTOKE HANTS RG21 1HA PHONE 0256-35462

TELEX 86736 SOTEX G (CRAIG COMMUNICATIONS)



AND LEADING COMPUTER
STORES

2ND EDITION

For your COMMODORE 64

Guthbert Enters the Tombs of Doom

£6.95



Our intrepid
hero's BACK.
In his latest action
packed adventure!

INVENTORY

- ★ 200 PLUS LOCATIONS in ye High Resolution Graphics
- ★ My Olde Manual To help ye on thy way
- ★ "Evyl Ones" whych do inhabit the tombs
- ★ TREASURES in great abundance
- ★ MAPS & CLUES so ye don't get too lost.

Another Intrepid Hero
JESMON HYS

Mail Order Sales from
Microdeal Mail Order 41 Truro Rd,
St. Austell Cornwall PL25 5JE

Credit Card Sales    
Phone 0726 73456



Dealers Contact
MICRODEAL DISTRIBUTION
0726-73456
or **WEBSTERS SOFTWARE**
0483 62222

MICRODEAL

Selected Microdeal Titles available from computer dealers nationwide or from larger branches of

 **John Menzies** and
Stores



Fans for the memory

Graham Paterson shows you how to get things moving on the Amstrad CPC 464

This program demonstrates how the Amstrad can use *Ink* statements to obtain animation in a similar way as that on the BBC machine.

I have used Mode 0 to obtain the maximum number of *inks*, although only seven colours are used.

The overall routine draws three fans, two of which are identical in colour. Then all the *Ink* statements are altered in sequence to obtain the desired effect of animation.

Program Notes

- 20-70 Sets the origin of graphics cursor and all delays, counters and ink colour variables
- 80 Print title
- 90-100 Assigns ink colours for starting
- 110-320 Draws the Fan using different inks and colours for a particular section of the Fan
- 330 Moves to counter
- 340-370 Assigns alternate inks with respective colours
- 400-410 Checks counter
- 420-440 Depending on counter, changes graphics cursor position, the *Ink* number being used and its colours
- 460-520 Changes all the *Ink* statements to sequential colours using for next loop to slow speed down. Creates the animation
- 530-560 Sound routine for fan movement

It should be noted that this program was originally developed from one that displayed cylinders. This may be observed if the *Draw* command in Line 140 is change to *Plot* and the *Rem* removed in Line 150.

```

10 REM:ANIMATED FANS
20 x=320:y=200
30 z=200:t=0:w=90:s=150
40 l=35:a=1:b=2:c=3:d=4:e=7:v=24:g=20:h=
0
50 MODE 0
60 BORDER 0:INK 0,0
70 CLS
80 LOCATE 4,1:PRINT"AMSTRAD FANS"
90 f=a:i=e
100 INK f,i
110 FOR p=1 TO 360
120 DEG
130 MOVE x,y
140 DRAW x+z*COS(p),y+1*SIN(p),f
150 REM:DRAWR 0,s,f
160 IF p>22.5 THEN GOSUB 350
170 IF p>45 THEN GOSUB 360
180 IF p>67.5 THEN GOSUB 370
190 IF p>90 THEN GOSUB 340
200 IF p>112.5 THEN GOSUB 350
210 IF p>135 THEN GOSUB 360
220 IF p>157.5 THEN GOSUB 370
230 IF p>180 THEN GOSUB 340
240 IF p>202.5 THEN GOSUB 350
250 IF p>225 THEN GOSUB 360
260 IF p>247.5 THEN GOSUB 370
270 IF p>270 THEN GOSUB 340
280 IF p>292.5 THEN GOSUB 350
290 IF p>315 THEN GOSUB 360
300 IF p>337.5 THEN GOSUB 370
310 INK f,i
320 NEXT p
330 GOTO 380
340 f=a:i=e:RETURN
350 f=b:i=v:RETURN
360 f=c:i=g:RETURN
370 f=d:i=h:RETURN
380 REM
390 t=t+1
400 IF t=2 THEN GOTO 430
410 IF t=3 THEN GOTO 440
420 x=120:y=300:s=50:z=50:l=25:a=5:b=6:c=
7:d=8:e=26:v=11:g=6:v=a:i=e:GOTO 90
430 x=500:y=300:l=75:GOTO 90
440 a=1:b=2:c=3:d=4:e=5:v=6:g=7:h=8
450 EVERY 5 GOSUB 540
460 INK a,24:INK b,7:INK c,0:INK d,20:IN
K e,0:INK v,26:INK g,11:INK h,6
470 FOR q=1 TO w:NEXT
480 INK a,20:INK b,0:INK c,7:INK d,24:IN
K e,6:INK v,0:INK g,26:INK h,11
490 FOR q=1 TO w:NEXT
500 INK a,0:INK b,7:INK c,24:INK d,20:IN
K e,11:INK v,6:INK g,0:INK h,26
510 FOR q=1 TO w:NEXT
520 INK a,7:INK b,24:INK c,20:INK d,0:IN
K e,26:INK v,11:INK g,6:INK h,0
530 FOR q=1 TO w:NEXT:GOTO 460
540 ENV 1,3,-2,85
550 ENT 1,5,-1,51
560 SOUND 1,150,5,11,1,1,5
570 RETURN

```


R E M E M B E R ...

the most terrifying film you ever watched.

Soon you'll be in it!

MIND GAMES

SPECTRUM 48K · CBM64



SIMPLY CHEAPEST SOFTWARE

CHECK THESE PRICES

SINCLAIR SPECTRUM

NEW TITLES	RRP	OUR PRICE
TWIN KINGDOM VALLEY	7.95	5.68
KOKO TONI WILF	6.95	4.96
AVALON	7.95	5.69
BEWARE HOUSE	5.95	4.25
WHITE LIGHTNING	14.95	10.69
PYJAMARAMA	6.95	4.96
TERROR HAWK	6.95	4.96
AIR TRAFFIC CONTROL	9.95	7.11
PERILS OF BEAR GEORGE	6.95	4.96
DRAGON FIRE	7.95	5.69
ALL LEVEL 9 GAMES	9.95	7.11
MOONSWEEPER	7.95	5.69
STAGE COACH	6.95	4.96
RIVER RAID	7.99	5.69
ENDURO	7.99	5.69
HERO	7.99	5.69
BLACK HAWK	6.95	4.96
DELTA WING	6.95	4.96
TRAXX	6.95	5.38
ZENJI	7.99	5.69
DEFUSION WORMS	6.95	4.00
SHERLOCK HOLMES	14.95	10.69

BEST SELLERS

MATCH POINT	7.95	5.68
PSYTRON	7.95	5.68
MONTY MOLE	6.95	4.96
DALEY'S DECATHLON	6.90	4.96
FRANK 'N' STEIN	5.95	4.25
FULL THROTTLE	6.95	4.96
SABRE WULF	9.95	7.11
TORNADO LOW LEVEL	5.95	4.25
WORLD CUP FOOTBALL	6.95	4.96
LORDS OF MIDNIGHT	9.99	7.15
STOP THE EXPRESS	5.95	4.25
CODE NAME MAT	6.95	5.07
RAPSCALLION	6.95	4.96
MICRO OLYMPICS	5.95	4.25
JET SET WILLY	5.95	4.25
JACK & THE BEANSTALK	5.95	4.25
MUGSY	6.95	5.00

SPECTRUM

OUR RRP	PRICE
FIGHTER PILOT	7.95 5.50
NIGHT GUNNER	6.95 4.99
FACTORY BREAKOUT	5.50 3.96
THE FOREST	9.95 7.11
FOOTBALL MANAGER	6.95 5.15
MANIC MINER	5.95 4.25
WORSE THINGS HAPPEN AT	
SEA	5.95 4.25
ALCHEMIST	5.50 3.96
HARRIER ATTACK	5.95 3.63
SCUBA DIVE	5.95 3.80
BLUE THUNDER	5.50 3.92
SNOWMAN	6.95 5.38
ATIC ATTACK	5.50 4.39

COMMODORE 64

NEW TITLES	RRP	OUR PRICE
INT. SOCCER (ROM)	9.99	8.24
TROLLIE WALLIE	7.00	5.00
TOY BIZARRE	9.99	7.14
ZENJI	9.99	7.14
RIVER RAID	9.99	5.64
STUNT BIKE	6.90	4.93
ALL LEVEL 9 GAMES	9.95	7.11
KOKO TONE WILF	6.95	4.96
HERCULES	6.95	4.96
FALCON PATROL 2	7.95	6.13
TERRORIST	7.95	6.13
BRUCE LEE	14.95	10.69
STRIP POKER	9.95	7.11
BEST SELLERS		
BEACH HEAD	9.95	7.11
DALEY'S DECATHLON	7.90	5.65
GOLF (ROM)	9.99	8.24
SOLO FLIGHT	14.95	11.51
POOYAN	9.95	7.67
THE QUILL	14.95	10.69
SUMMER GAMES (DISK)	19.95	14.26
ENCOUNTER	9.95	7.11
HOBBIT	14.95	10.69
DALLA QUEST (DISK)	14.95	10.69
FOOTBALL MANAGER	7.95	5.68

COMMODORE 64 (CONT)

OUR RRP	PRICE
VALHALLA	14.95 10.69
LOCO	7.95 5.68
WIMBLEDON	7.95 5.68
BLACK HAWK	7.95 6.33
TALES OF ARABIAN NIGHTS	7.00 5.39
BLAGGER	7.95 5.68
DECATHLON	9.95 7.25
POTTY PIGEON	7.95 5.70
GILLIGAN'S GOLD	6.90 4.93
PITFALL	9.99 7.15
HERO	9.99 7.25
CAVELON	6.90 4.93
AZTEC CHALLENGE	8.95 6.87
FORBIDDEN FOREST	8.95 6.89
TRASHMAN	7.95 6.07
FLIGHT PATH 737	7.95 5.68
FALL OF ROME	6.99 5.00
HEROES OF KARN	7.00 5.39
HEATHROW AIR TRAFFIC	
CONTROL	7.95 5.68
HUNCHBACK	6.90 4.95
EVIL DEAD	6.99 5.00
SHEEP IN SPACE	7.50 5.90
HULK	9.95 7.11
MANIC MINOR	5.95 4.25
TWIN KINGDOM VALLEY	9.50 6.79
BEAMRIDER	9.99 7.25
REV. MUTANT CAMELS	7.50 5.36
HARRIER ATTACK	6.95 4.96
THE BOSS	8.95 6.39
BBC	
WHITE KNIGHT MK2	11.50 8.50
MICRO OLYMPICS	5.95 4.25
HOBBIT	14.95 7.00
FOOTBALL MANAGER	7.95 5.68
FORTRESS	8.95 6.39
GHOULS	7.95 5.68
ELITE	14.95 10.69
SON OF BLAGGER	7.95 5.69
TARZAN	7.95 5.69
AVIATOR	14.95 10.69
CHUCKIE EGG	7.90 5.65

BARGAIN SOFTWARE

10 MELODY COURT, STONEHILL ROAD ESTATE, LONDON W4 3AW
TEL: (01) 995 2763

Just your type....

Bored with that same old type face? Take heart, and take a look at R Snowdon's Definer program for the QL

This program allows the user to choose a character he or she wants to define, then presents a blow-up of this character, as well as the actual size while defining. This is very useful when designing gothic or modern character sets.

It is quite simple to operate. When the code of the character to be defined is input, the character size must be entered, CSize ? , 0. This can be in the range nought to three.

This is necessary because the QL uses a different range of pixels in each character row, depending on the pre-set character size. For instance, character size one gives the maximum 8 pixels across, and character size three gives 5 pixels.

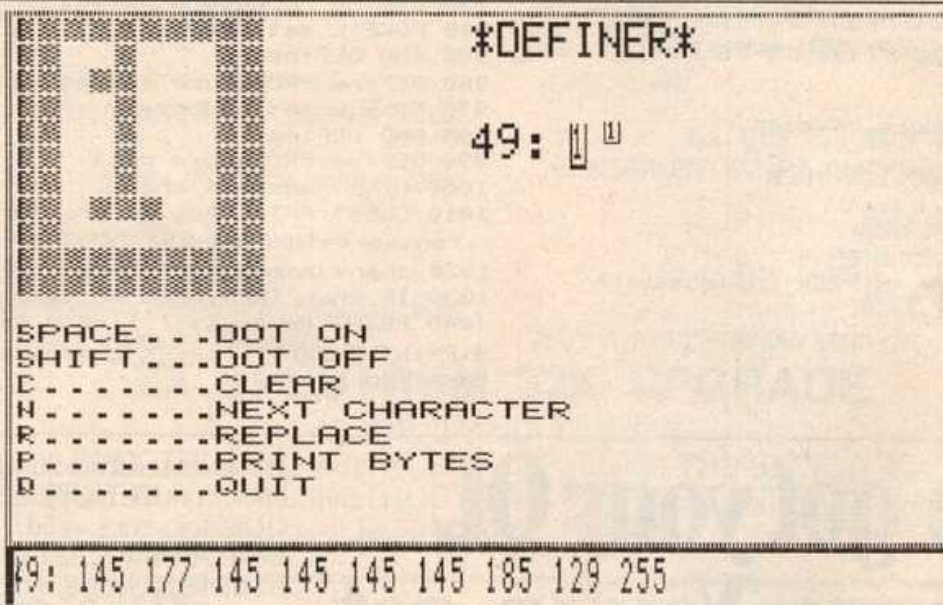
When these graphics are used in your own programs, you must use the CSize command with the character size (which you entered when defining the character)

as its first argument, eg, CSize 1,0 or CSize 1,1. Failure to do this may cause odd things to happen. After this, the user can experiment with the character definition on the blow-up grid.

Commands

Space-bar: light pixel at cursor position
Shift: remove pixel at cursor position
C: clear grid
N: next character definition
R: replace old character definition
P: print out definition bytes
Q: leave program

If space has already been reserved on the QL (Respr(100)... etc), I recommend the QL is reset before running Definer.



```
1 REMark : QL Graphics Definer
2 REMark : by Richard Snowdon (*SnowSoft*)
100 WINDOW #1,450,210,33,6:PAPER 0
110 WINDOW #0,450,40,33,216:PAPER #2,0
120 MODE 4:SCALE 256,0,0:BORDER
2,175:BORDER #0,2,2
130 moveset
140 ask
150 initiate
160 setup
170 display
180 newset
190 start
200 STOP
210 DEFINE PROCEDURE initiate
220 CSize 2,0
230 DIM pix(9,8)
240 FOR f=1 TO 9
250 FOR e=1 TO 8
260 pix(f,e-(size>1))=((PEEK(charbase+f)
&&(2^(8-e)))=0)*32
270 NEXT e:NEXT f
280 x=1:y=1
290 END DEFINE
300 DEFINE PROCEDURE display
310 FOR f=1 TO 9
320 FOR e=1 TO across
330 AT f,e:PRINT CHR$(pix(f,e))
340 NEXT e:NEXT f
```

```
350 END DEFINE
360 DEFINE PROCEDURE start
370 REPEAT mainloop
380 k=KEYROW(1)
390 AT y,x:PRINT CHR$(pix(y,x))
400 IF KEYROW(6)&&8 THEN CSize size,1:STOP
410 IF KEYROW(2)&&8 THEN
420 FOR f=1 TO 9:FOR e=1 TO 8:pix(f,e)=32:
NEXT e:POKE charbase+f,0:NEXT f:display
430 END IF
440 IF k&&2 AND x>1 THEN x=x-1
450 IF KEYROW(5)&&16 THEN
460 FOR replace=1 TO 9:POKE charbase+
replace,PEEK(oldbase+10+(a-32)*9+replace):N
EXT replace:initiate:display
470 END IF
480 IF k&&16 AND x<across THEN x=x+1
490 IF k&&4 AND y>1 THEN y=y-1
500 IF k&&128 AND y<9 THEN y=y+1
510 IF KEYROW(7)&&1 AND pix(y,x)=0 THEN
pix(y,x)=32:POKE charbase+y,(PEEK(charba
se+y)^(2^(8-x-(size>1))))
520 AT 4,22:CSize size,1:PRINT CHR$(a);' ';
:CSize size,0:PRINT CHR$(a):CSize 2,0
530 IF k&&64 AND pix(y,x)=32 THEN pix(y,x)
=0:POKE charbase+y,(PEEK(charbase+y))
!2^(8-x-(size>1))
```

Continued over the page


```

540 IF KEYROW(7)&&64 THEN RUN
550 IF KEYROW(4)&&32 THEN prit
560 AT y,x:PRINT CHR$(32+(pix(y,x)>0)*255)
570 END REPEAT mainloop
580 DEFINE PROCEDURE setup
590 CLS
600 CSIZE 2,1:AT 0,18:PRINT "*DEFINER*":AT
2,18:PRINT a;':':CSIZE 2,0
610 AT 12,0:PRINT "SPACE...DOT ON\"SHIFT.
...DOT OFF\"C.....CLEAR\"N.....NE
XT CHARACTER\"R.....REPLACE\"P.....
PRINT BYTES\"Q.....QUIT"
620 INK 2:CSIZE #0,1,1
630 across=8-2*(size=0)-3*(size>1)
640 AT 0,0:PRINT FILL$(CHR$(255),across+2)
650 FOR y=1 TO 9:AT y,0:PRINT CHR$(255);
FILL$(" ",across);CHR$(255)
660 PRINT FILL$(CHR$(255),across+2)
670 INK 7
680 END DEFINE
690 DEFINE PROCEDURE moveset
700 set=167722
710 IF RESPR(0)>261120 THEN
720 oldbase=PEEK_L(set)
730 newbase=RESPR(875)
740 FOR m=0 TO 875 STEP 4
750 POKE_L newbase+m,PEEK_L(oldbase+m)
760 NEXT m
770 END IF
780 oldset
790 END DEFINE

```

```

800 DEFINE PROCEDURE ask
810 CLS:CSIZE 0,0
820 PRINT "Select the character to be
re-defined\"by entering its code (32-127)
830 INPUT \"Character code? ";a
840 IF a<32 OR a>127 THEN STOP
850 PRINT \"What character
size (0 to 3)? ";
860 REPEAT vet
870 size=INKEY$(-1)
880 SELECT ON size=0 TO 3:EXIT vet
890 END REPEAT vet
900 PRINT size
910 charbase=newbase+10+(a-32)*9
920 END DEFINE
930 DEFINE PROCEDURE newset
940 POKE_L set,newbase
950 END DEFINE
960 DEFINE PROCEDURE oldset
970 POKE_L set,oldbase
980 END DEFINE
990 DEFINE PROCEDURE prit
1000 LOCAL answer$,chan
1010 CLS#0:PRINT #0,\"To printer (y/n)
\";:answer$=INKEY$(-1)
1020 chan=(answer$=\"Y\")*8
1030 IF chan THEN OPEN #8,ser1
1040 PRINT #chan,\"a;';\":FOR B=1 TO
9:PRINT #chan;';:PEEK(charbase+B);:NEXT B
1050 END DEFINE

```

You've got your QL hardware. You've got your Psion software.



Now get your Sunshine book.



Just released from Sunshine is the latest book from the highly acclaimed QL Classics series – and it's called *Quill, Easel, Archive & Abacus on the Sinclair QL*. All these packages, which are included with every QL sold, are recognised as powerful in their own right, but when working together with one another, they become highly effective problem-solving tools for business.

Alison McCallum-Varey's book introduces you to all the four packages, but, most importantly, shows you exactly how to run them as a complete system.

This book, essential for every QL Owner, will expand the day-to-day use of your QL, letting you run Quill and Archive in tandem for instance, and then outputting the results for graphic interpretation by the Easel package.

If you've Quill, Easel, Archive and Abacus on your Sinclair QL, then you need *Quill, Easel, Archive and Abacus on the Sinclair QL*.

Please send me Quill, Easel, Archive & Abacus on the Sinclair QL at £6.95 plus 50p p&hp. I enclose a cheque/postal order for £

☐ Please charge my Visa/Access card No.

valid from

expires end

Signed:

Name:

Address:

Send to: Sunshine Books, 12/13 Little Newport Street, London WC2R 3LD. Look out for the Sunshine range in W.H. Smith's, Boots, John Menzies, other leading retail chains and all good bookshops. Dealer enquiries: 01-437 4343.



SPECTRUM



FOX — YOUR COMPUTER!!!

With our superior add-ons for the
SPECTRUM + VIC-20

THE ULTIMATE IN JOYSTICK
INTERFACES

Once
programmed,
never needs
programming
again!

THE FOX PROGRAMMABLE INTERFACE —
AN INTERFACE WITH

- ◇ Complete compatibility with all programs
- ◇ In built memory to store up to 16 different games keysets at one time
- ◇ A reset switch so no power off during game changes
- ◇ Full casing
- ◇ Through port for further expansion
- ◇ Full compatibility with the microdrive
- ◇ Built in pseudo ROM facility with room for personal tool kit
- ◇ Quickshot II joystick rapid fire compatible

The interface reviewed in Sinclair User as "very good value and very clever and provides the easiest interface on the market to use"

ALL THIS FOR **ONLY £28.95** INCL
or COMPLETE WITH A QUICKSHOT I JOYSTICK FOR

ONLY £34.95 INCL
or with QUICKSHOT II JOYSTICK

ONLY £36.95

PLUG IN, SWITCH ON AND SIMPLY PLAY THE GAME WITH FOX

ZX SPECTRUM 32K UPGRADE

ISSUE 2 AND ISSUE 3

TAKE YOUR 16K SPECTRUM TO 48K IN SIMPLE STEPS. THE KIT REVIEWED BY SINCLAIR USER AS "THE BEST BUY" FULL INSTRUCTIONS SUPPLIED AND FULL GUARANTEE GIVEN

ONLY £23.00 INCL

AMAZING!!! FOR THE VIC-20 16K SWITCHABLE RAM PACK

- Gives you the option of 16K, 8K or 3K in one cartridge.
- Simply plugs into rear port.
- Fully compatible with all existing motherboards.
- Fully guaranteed (1 year).
- 14 day moneyback guarantee if not delighted.
- No re-addressing of existing Basic programs needed.



£34.95

All products are stocked and are despatched within 14 days

PLEASE SEND ME

- ☐ INTERFACE
- ☐ INTERFACE + JOYSTICK
- ☐ SPECTRUM UPGRADE
- ☐ VIC-20 16K RAM PACK

Name

Address

Barclaycard No

Visa

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--



FOX ELECTRONICS

FOX HOUSE 35 MARTHAM ROAD, HEMSBY
GREAT YARMOUTH, NORFOLK NR29 4NQ
Tel: 0493 732420 (24 HR Ansaphone/sales)



New for the ZX81

CLIMBER

for 16K ZX81

Jump up to get the Power Buttons



BEARS IN THE WOOD

for 16K ZX81

As Mother Bear you must guide



Dealer Enquiries welcome

through 9 Levels being careful to avoid the Guardian Droids firing the deadly Plasma Bolts.

your cubs through the wood avoiding the ruthless Hunters. To get to the safety of your cave.



TOTALLY ORIGINAL ARCADE ACTION

only £3.95+50p p.and p. to:

Unicorn Micro Systems

312 Charminster Road, Bournemouth

Tel: (0202) 532650

HIGH SPEED



COMMODORE 64 owners, at last the long wait is over — FASTBACK allows multipart software to load around ten times faster and run independently of the utility. For example 'The Hobbit' loads in 150 seconds with FASTBACK.

Supplied on tape with full instructions

ONLY £9.95

AMSTRAD

SPEEDMASTER is here. Allows choice of save speed. Approx. 2 x faster.

ONLY £7.95

TAPE TO DISK TRANSFER UTILITIES

Transfer games etc. to disk. Supplied on tape with full instructions for:—

BBC £9.95

ATARI (All models) £9.95

COMMODORE 64
NEW IMPROVED VERSION

No user knowledge required.

We guarantee this is the best available.



All prices include VAT,
Post & Packing. Cheques, P.O.
or Phone your Card Number to:

DISCO

Still only
£9.95



EVESHAM MICRO CENTRE

Bridge St, Evesham, Worcestershire

Tel: 0386 49641

NEW SHOP NOW OPEN—Micro Centre,

1756 Pershore Rd, Cotteridge, Birmingham Tel: 021-458 4564

TRADE AND OVERSEAS ORDERS WELCOME

NOW
3RD
GREAT
YEAR!

HIRE

SPECTRUM
ZX81 and
COMMODORE 64
TAPES

HUGE RANGE!

ADVENTURE
GAMES
ARCADE and
SIMULATION GAMES
BUSINESS
and PRACTICAL
PROGRAMS
UTILITIES
M/C COMPILERS
EDUCATIONAL
FROM OVER
60 TOP SUPPLIERS

FREE

ILLUSTRATED
QUARTERLY
MAGAZINE WITH
TIPS, NEWS,
REVIEWS
DISCOUNT OFFERS

LIFE

MEMBERSHIP

£5.00

TAPE HIRE FROM

50p

INCLUDING VAT

OVER

3,000

DELIGHTED MEMBERS!

SPECIAL OFFER!

YOUR FIRST TWO

TAPES FREE

IF YOU USE THIS COUPON!

or send £1 for magazine & details

Props: ALEC FRY ARPS, FRSA and

ERNA FRY, BA

To: SOFTWARE LIBRARY, Farnham Road, West Liss, Hants GU33 6JU.

NAME.....Machine.....

ADDRESS.....

THE ORIGINAL SOFTWARE LIBRARY!

Special offer from this issue: LIFE MEMBERSHIP £5

(normally £9.50). Overseas (Europe only) £10, or
join local branch in W. Germany, France, Holland,
Belgium, Scandinavia, South Africa, Ireland—send
Int. Reply Coupon and we'll forward your enquiry.
All software supplied with publishers permission.

ACCESS



THE MEGASAVE FANTASTIC SAVINGS

SPECTRUM

SHERLOCK	12.95
SABLE WOLF	8.25
PSYTRON	6.30
MUGSY	5.95
JACK & BEANSTALK	4.95
TORNADO LOW LEVEL	4.75
BEACH HEAD	6.85
LORDS OF MIDNIGHT	8.50
KOSMIC KANGA	4.95
MONTY MOLE	5.85
ANTICS	5.75
DECATHLON (DALEYS)	5.85
CAVELON	4.95
RAPSCALLION	5.85
AUTOMANIA	5.75
TWIN KINDGON VALLEY	7.95
HAMPSTEAD	6.50
LEGEND OF AVALON	7.95
KENTILLA	6.95
BRAXX BLUFF	6.95
RIVER RAID	6.85
HERO	6.85
GIANTS REVENGE	4.95

SPECTRUM

GIANTS REVENGE 4.95

MICRO OLYMPICS

WHITE LIGHTNING	12.50
FRANK N. STEIN	4.95
FULL THROTTLE	5.95
QUILL	10.75
PSYTRAXX	6.85
STAR BIKE	5.95
KOKOTONI WOLF	4.95
DELTA WING	5.95
STAGE COACH	5.95
BLACK HAWK	5.95
TERRAHAWKS	5.85
GILLIGAN'S GOLD	4.95

COMMODORE

QUILL	11.50
DECATHLON (DALEYS)	6.85
FOOTBALL MANAGER	6.85
JET SET WILLY	6.95
KOKOTONI WOLF	5.95
STUNT BIKE	5.75
QUO VADIS	8.75
MONTY MOLE	6.85
ZAXXON	8.75

SPITFIRE ACE	8.75
NATO COMMANDER	8.75
F15 STRIKE EAGLE	12.50
HIGH NOON	6.85
HAVOC	8.50
WORLD CUP	5.85
RIVER RAID	8.50
ANKM	7.85
AZTEC	7.85
MR ROBOT	7.85
PSYTRON	6.85
ANCIPAL	6.50
POSTER PASTER	5.85
JAVA JIM	8.95
CURRAH SPEECH	27.50

POST & PACKAGING FREE
STATE WHICH MICRO FAST
SERVICE
SEND CHEQUE/P.O. TO:
MEGASAVE Dept 1, 76
Westbourne Terrace,
London W2

COMMODORE 64 DATABASE — DATAFILE

Powerful options include: print all/selective records, delete, amend, save, load, copy, alphanumeric sort, user defined fields, memory check, total numeric fields, multi field interrelational, global and between limits searches, etc. Fully menu driven with comprehensive easy to use instructions.

CBM 64 (compiled)

cassette £7.45

CBM 64 (compiled)

disk £10.45

COMMODORE 64 WORDPRO — TEXTFILE

Powerful word processor, facilities include — large text buffer, auto centre, variable tab, insert, amend, delete, copy, move text word count, right justify, paging, join files, multiple file handling, print all/part text etc. Fully menu driven with comprehensive easy to use instructions. Great value.

CBM 64 (compiled)

cassette £8.25

CBM 64 (compiled)

disk £10.75

All programs with full documentation and guarantee and can be used with all direct connect CBM64 printers including 1520 printer/plotter. Also most centronics (with suitable hardware interface). Price includes fast delivery by first class post.

Cheques/PO's to: A & C SOFTWARE

51 Ashtree Road, Tividale, West Midlands B69 2HD

Drive faster!



1541 EXPRESS

There's nothing worse than waiting for your program to load. And good though the Commodore 1541 is, speed isn't exactly its biggest feature.

Hook up the new 1541 Express from RAM, though, and you'll be up and running like lightning.

This ingenious add-on speeds up data transfer from the 1541 and new 1542 disk drives to your Commodore 64. So much so, that you'll wonder how you ever found the patience to wait before.

With the Express you can load programs in a third of the normal time. That means less frustration and less time wasted.

(You can fit it yourself in minutes, too – and disconnect it just as easily).

The new 1541 Express from RAM.

To shift your drive into top gear call into your nearest dealer today.

Or call our credit card hot line on 02514 25252. (Access and Visa welcome).

Or complete the coupon below and send it today to:
Dept PCWK, Ram Electronics (Fleet) Ltd, 106 Fleet Road, Fleet,
Hampshire, GU13 8PA.

24 Hr despatch for credit cards and postal orders.

Please send me:

_____ 1541 Express High Speed Disk Loading Cartridge(s)
at **£49.95**. + £1 p&p (overseas orders £3 p&p)

I enclose cheque/postal order or charge Access/Visa for £ _____

  ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Name _____

Address _____

Post Cd. _____

Tel. _____

To Dept PCWK, Ram Electronics (Fleet) Ltd, 106 Fleet Road, Fleet, Hampshire GU13 8PA.

Trade and export enquiries welcome.

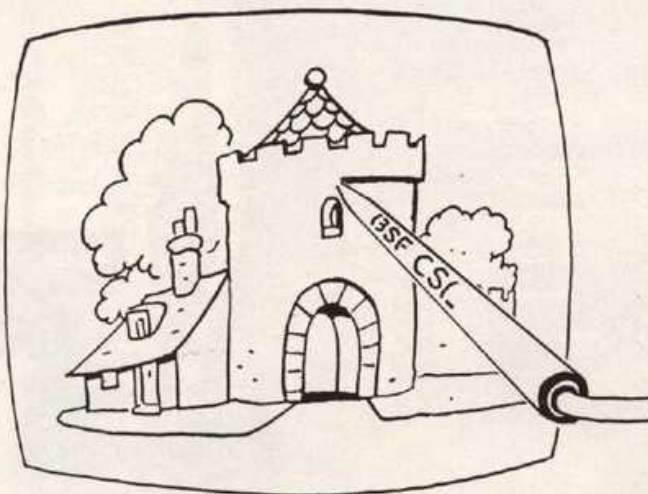


A FREE LIGHTPEN

Yes a **FREE** Light Pen! with every **GRAPHKIT!** Graphkit is the ultimate in drawing!, designing! or painting! (using the light pen of course, which incidentally has a full 3 year warranty!) Graphkit will amongst other things allow you to:

- Draw free handed on the screen anything from a Micky Mouse to your latest integrated circuit! With all the fill colour and erase facilities of course!
- Save/load your latest master piece to/from the disk/tape drive
- Or directly copy the drawing on the screen to the printer! And keep it for ever or send to a friend as a post card!
- Design your own colourful sprites and characters
- Play the games in the package! or use the light pen in your own games/education/programs

GRAPHKIT is available on disk and tape. Tape version is £15.95 and disk version (recommended) is **£19.95.**



All you 1540/1541 disk users **DMON!** is here at last. Dmon is the disk monitor you have been waiting for it will allow you to:

- read/write blocks from/to the disk
- display and edit blocks on the screen
- display and send disk messages/commands
- transfer your programs from tape to disk or disk to disk or even disk to tape! ● and more!

DMON comes on DISK at only **£9.95.**

Do you use tapes? Are you sick and tired of waiting for your programs to be Loaded/Saved from/on the tape? Then you need a **TORNADO!!** Tornado allows you to Save/Load/Verify your Basic/machine code programs faster than a CBM 1541 disk drive does! Due to popular demand! Tornado now comes with new and more powerful commands plus extra instructions to assist you in making fast versions of your existing machine code/Basic programs. Tornado is available on tape for CBM 64 and 8K + Vic 20.

Do your Run/Stop and Restore keys often fail? Do you want to come out of those crashes?! Or get into those unbreakable programs?! Then what are you waiting for, get yourself a **BREAKER!!** Reset switch and let your computer know who is the boss!! Breaker can be connected to your machine in seconds, no soldering. Included with the Breaker is a copy of basic recovery software on tape. Now available for any CBM 64 or Vic 20.

MAD SUMMER OFFER
A FREE BREAKER WITH
EVERY TORNADO IF YOU
USE THE COUPON BELOW

BSF CSL, 82 FURNACE DRIVE, CRAWLEY, W SUSSEX
RH10 6JE.

Please send meTornado at £9.95 + my
free! Breaker

Please send meBreaker at £7.95

Please send meRom-File at £7.95

Please send meGraphkit at £15.95 (tape)

Please send meGraphkit at £19.95 (disk)

Please send meDMON at £9.95

I enclose cheque/PO/cash to the sum of £.....

Name.....Computer.....

Address.....

.....

Please use this form and block letters only. All prices are inclusive of p&p (mail order only, add £2 if outside UK). Please post to:

BSF CSL, 82 FURNACE DRIVE, CRAWLEY, WEST
SUSSEX RH10 6JE.

Fatal mistake

A simple error recovery for the CBM 64
by Simon Wallace

One of the most frustrating occurrences is for a program to crash due to program error. Very often, this error will be due to silly input by the user, and it may not even be possible to guard against such an event from within the Basic program. The only answer is to design programs to recover from error, even where you do not believe that an error could occur!

Many languages and machines have automatic facilities to assist in recovery, but the Commodore 64 does not. The routine shown in this article will enable control to be restored to the program automatically in the event of an error.

The first step is to establish a point in the program which is suitable to *Goto* in order to recover. When a program is started with *Goto* rather than *Run*, the variables are not reinitialised, and the program will restart in the same state as when it was broken. Thus, nothing is lost provided that the program has been designed to restart.

The program must not attempt to define arrays with the *Dim* statement or functions with *Def Fn* as this has already been done once. Files can not be opened a second time, nor can *Data* be *Read* a second time, unless *Restore* is used.

As you will be unable to predict where the error will occur, it is very difficult to make assumptions. If files may or may not be open, always close, then re-open them in the error routine, as this will not cause an error. Never re-enter in the middle of a subroutine or *For-Next* loop. These procedures can be restarted safely, but can not be exited from unless they have been entered at the very beginning. If tape or disc files are being processed, then a specialised data-recovery routine may be needed.

If you set up an error-handling routine according to the above rules, you will be able to restart the program manually by typing *Goto xxx* where *xxx* is the line number of your routine. This in itself can be invaluable. Consider working with the word processor for an hour (as I am at the moment) and not daring to make a mistake lest all your typing be lost! My word processor has just such an error-recovery routine at Line 999 – an easy number to remember. (See *PCW* Vol 3, Nos 26, 27 for listing of word processor.)

The machine-code routine automates the process of typing *Goto 999* when an error has occurred. This may sound trivial, but it is far easier to include the routine in the program, than to attempt to explain how and when to recover.

It works as follows: When the error-message routine of the Commodore 64 is entered via the vector at 768-769, control is

directed to the new routine which inserts *Goto 999* into the keyboard buffer. As soon as Basic is ready to accept your next command, the message is processed as if it had been typed on the keyboard. In addition to this, the error message number is copied into the unused byte at location 2. The recovery routine in your program can then access this number if so desired. The meanings of the error numbers are given in the table below.

The routine is located at 679 which should be unused. If this is not convenient, change the value of *J* in Line 20 to the start address you prefer. If you would rather use a line number other than 999, change the 57 in Lines 74, 75 and 76 to the ASCII codes for the 3-digit line number required (see Appendix F in the User Manual). If you wish the error message to be suppressed, include Line 89 as, 89 *Data 162-128*. To reset the vector for

normal error handling, *Poke 768,139: Poke 769,227*.

The example program demonstrates how the error-handling routine works. When the program is run, enter any positive number. There will be no abnormal effect as the arithmetic is valid. If zero is entered, a program error is generated as division by zero is illegal.

The program uses the routine to recover by passing control to Line 999. The error message number is found with *Peek(2)*, and then printed. Provided it is 20 as expected, control is returned to the main loop. Try changing Line 115 so that it generates a different error, such as a syntax error, and see what effect it has.

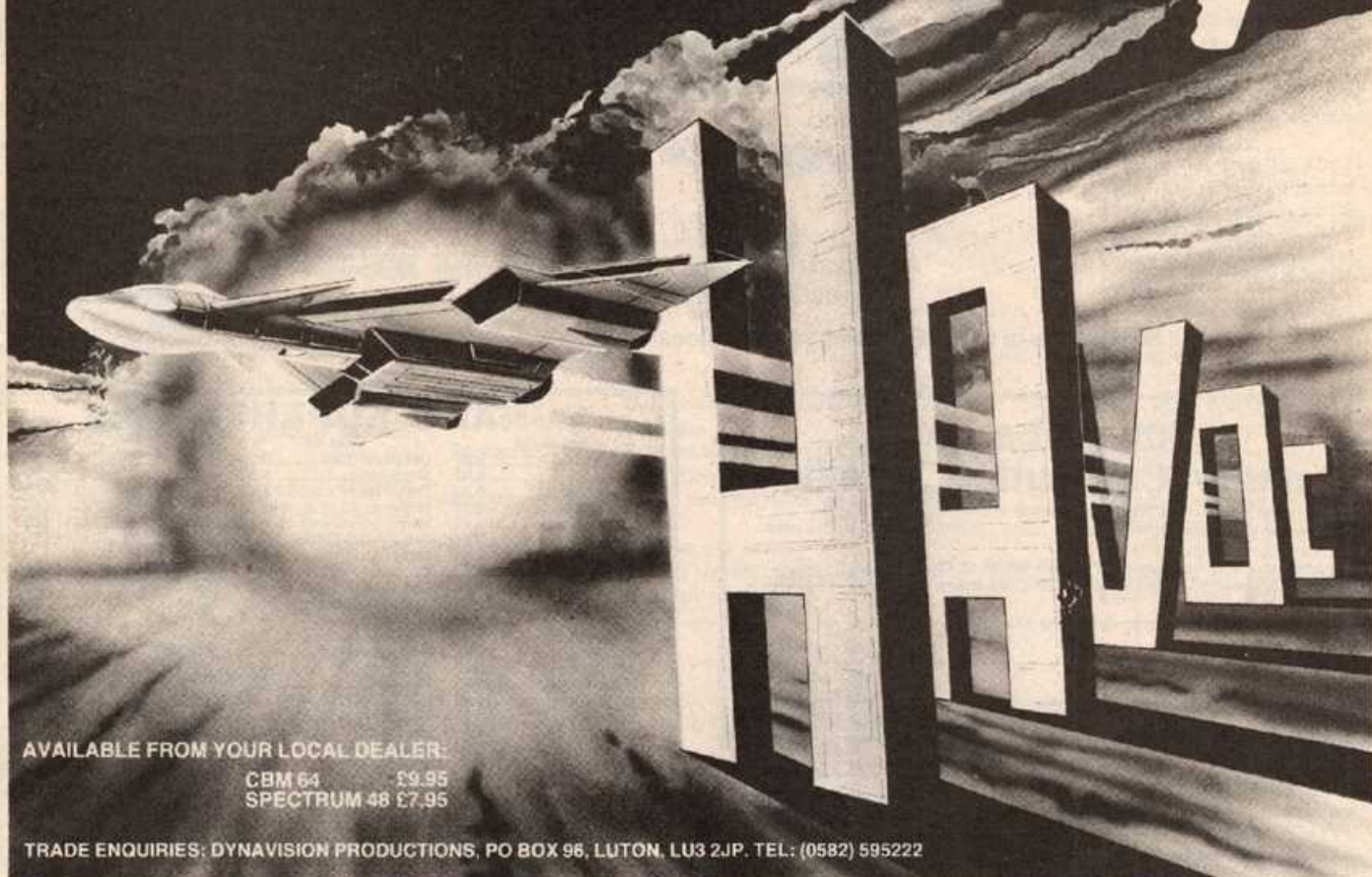
Clearly, any professional-quality program should include an error-recovery routine such as this. However, even the most basic Basic will be more satisfying if it keeps going to the correct end. Additionally, error-proofing such as this can be used in conjunction with break-proofing (see *PCW* Vol 3, No 13) to ensure that a program terminates as intended without the user being able to interrupt execution, whether by accident or design.

Error message table

Byte 2	Message
1	TOO MANY FILES
2	FILE OPEN
3	FILE NOT OPEN
4	FILE NOT FOUND
5	DEVICE NOT PRESENT
6	NOT INPUT FILE
7	NOT OUTPUT FILE
8	MISSING FILE NAME
9	ILLEGAL DEVICE NUMBER
10	NEXT WITHOUT FOR
11	SYNTAX
12	RETURN WITHOUT GOSUB
13	OUT OF DATA
14	ILLEGAL QUANTITY
15	OVERFLOW
16	OUT OF MEMORY
17	UNDEF'D STATEMENT
18	BAD SUBSCRIPT
19	REDIM'D ARRAY
20	DIVISION BY ZERO
21	ILLEGAL DIRECT
22	TYPE MISMATCH
23	STRING TOO LONG
24	FILE DATA
25	FORMULA TOO COMPLEX
26	CAN'T CONTINUE
27	UNDEF'D FUNCTION
28	VERIFY
29	LOAD
30	BREAK

Continued over the page

EXPERIENCE THE STUNNING 3-D REALISM OF



AVAILABLE FROM YOUR LOCAL DEALER:

CBM 64 £9.95
SPECTRUM 48 £7.95

TRADE ENQUIRIES: DYNAVISON PRODUCTIONS, PO BOX 96, LUTON, LU3 2JP. TEL: (0582) 595222

Will your cassettes get duplicated this Christmas?

This year, unprepared software houses will get caught by the seasonal rush to deliver orders that are often placed late by distributors and multiples.

Safeguard your turnover this year by a) ordering early b) using the most reliable duplicating company c) getting a back-up supplier.

DataClone copies data exclusively, unlike many others who have to cope with music as well. This year we have increased capacity, for the third year running, giving us one of the biggest facilities in the U.K.

Don't take chances this Christmas — tell us your schedule now and secure your product. Use the U.K.'s most experienced duplicator — your first source — or your second.

DataClone — Experience Counts.



Power Load for
anti-piracy &
fast loading.



DATACLONE

Unit 1, Roslin Square, Roslin Road, London W3 8DH.
Telephone: 01-993 2134. Telex: 21879.

Huge new capacity!
1 MILLION
cassettes per month

TITANIC

The Adventure Begins...

With Currah Micro Speech

FREE on Side 2
a mini-epic in high energy rock
TITANIC (The music)



FOR 48K SPECTRUM

R&R Software Ltd, 5 Russell Street, Gloucester GL1 1NE. Tel: 0452 502819

NOW AVAILABLE
ONLY £7.95

Subscribe to Popular Computing Weekly

I would like to subscribe to *Popular Computing Weekly*.
Please start my subscription from the issue

UK Addresses ☐ 26 issues at £18.70 ☐ 52 issues at £19.95
Overseas Addresses ☐ 26 issues at £18.70 ☐ 52 issues at £37.40
Please tick relevant box

I enclose my cheque to *Popular Computing Weekly* for

Name

Address

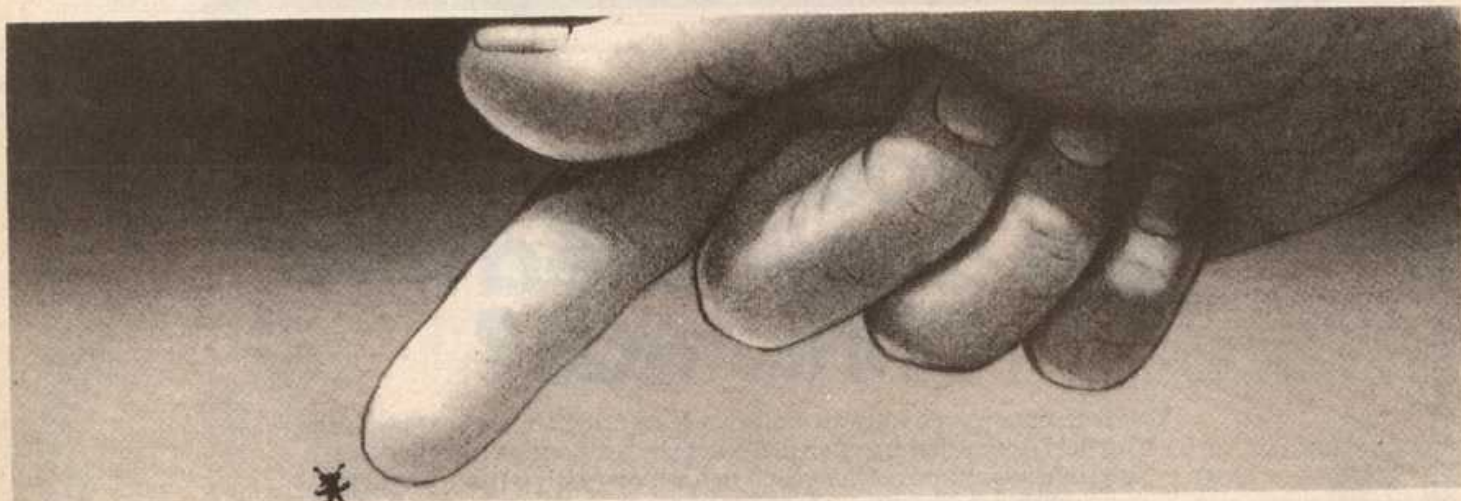
Please send this form, and cheque, to *Popular Computing Weekly*, Subscription Dept.
12-13 Little Newport Street, London WC2R 3LD.

SUNARO SUPERSAVERS

Spectrum	CBM 64	BBC
Monty Mole..... 5.80	Decathlon (Daley)..... 6.90	Frak..... 7.85
Star Trader..... 5.80	Monty Mole..... 6.95	Mr Wiz..... 6.95
Beach Head..... 6.70	Potty Pigeon..... 6.95	Zalaga..... 7.85
Full Throttle..... 5.90	Merlin..... 6.25	Star Striker..... 6.95
Micro Olympics..... 4.95	Where's My Bones..... 6.10	Elite..... 13.25
Hareraiser (Prelude)..... 7.75	Astro Chase..... 6.10	Mini Office..... 5.25
Just Set Willy..... 4.95	Flip Flop..... 7.80	
World Cup..... 5.80	Decathlon (Activ)..... 8.75	ELECTRON
TLL..... 4.95	Wimbledon..... 6.95	Gisburnes Castle..... 6.95
Olympicon..... 4.95	Arabian Knights..... 6.10	Mr Wiz..... 6.95
Mission 1..... 6.70	Trollie Wallie..... 6.10	Blagger..... 6.95
Orc Slayer..... 4.65	Evil Dead..... 6.95	
Sabre Wulf..... 6.40	Football Manager..... 6.95	ATARI
Lords of Midnight..... 8.40	Encounter..... 8.75	Warlock..... 13.25
Giants Revenge..... 5.80	Mission 1..... 7.85	Encounter..... 8.75
Jack & the B/stalk..... 4.95	Death Star Interceptor..... 8.75	Solo Flight..... 13.25
Mad Hatter..... 4.65	Beam Rider..... 8.75	
Frank N Stein..... 4.95	Hero..... 8.75	AMSTRAD
Decathlon (Daleys)..... 5.80	Kokotoni Will..... 6.10	Hareraiser (Prelude)..... 7.85
High Noon..... 5.80	Mystic Mansion..... 7.85	Star Commando..... 7.85
	Quickshot II Joystick..... 8.75	

Postage & VAT included. Send cheque/PO with order to:

SUNARO SOFTWARE (PCW4)
PO BOX 78, MACCLESFIELD, CHESHIRE, SK10 3PF



Be the master of 49,152 pixels.

Get all your pixels on your Spectrum completely under your control. Dominate their existence. Mastermind their every move. And do it all in machine code, so they move fast to produce exactly the amazing displays you really want.

Here's a great new book from the Sunshine people, all about machine code sprites and graphics on the Spectrum.

Read it, understand it, and then start to move those pixels. And remember, with this new book you'll discover the secret of the shrinking window!

Look out for the Sunshine range in W.H. Smith's, Boots, John Menzies, other leading retail chains and all good bookshops. Dealer enquiries: 01-437 4343.

machine code sprites
and graphics
for the ZX spectrum
a complete guide to sprite coding

John dunn



Please send me Machine Code Sprites and Graphics for the ZX Spectrum at £6.95 plus 50p p&g.

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

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

☐ Please charge my Visa/Access card No.....

valid from..... expires end:.....

Signed:.....

Name:.....

Address:.....

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

POPULAR COMPUTING WEEKLY

Time is on your side

Andrew Heptonstall shows you how to teach children the time (without resorting to Playschool) on the BBC B

This program was designed to help children learn to tell the time. To make this process easier, it has three levels of difficulty. Level one tests hours only, level two includes quarter and half-past the hour, and level three goes on to explore the mysteries of five minute intervals!

I would suggest that an adult is present when the program is first run, to show the child how to enter his or her answer. Possible answers are presented in a multiple choice format and either answer one, two or three is chosen. This method of presentation was used to prevent spel-

ling mistakes causing problems.

The program should work on a Model A if the *Colour* and *Gcol* statements are missed out, and the *Mode 1* statements are changed to *Mode 4*.

Program notes

Procinit: Calls procedures to set up the program.
Proccarray: Fills the array which contains the times.
Procname: Asks you to type in your name.
Procllevel: Choose the level.
Proccrandomtimes: Selects random times depending on the level.

Procmain: Calls the other procedures.
Proccolours: Redefines the colours.
Procclock: Draws the clock.
Procchands: Draws the hands on the clock.
Proccchoose: Chooses times for the other options.
Proccime: Divides the time by 5.
Proccprint: Prints the time in a random order on the screen.
Proccanswer: Waits for an answer.
Procctick: Draws a tick if the answer is correct.
Proccross: Draws a cross if the answer is wrong.
Proccpause: Pauses for a set amount of time.
Fnx: Prints a x co-ordinate for drawing the clock.
Fny: Provides a y co-ordinate for drawing the clock.
Fnhour: Selects a random hour.
Fnmin: Selects a random minute, depending on the level. (This function is not called if the level selected is one).

```

10 REM ** The Time Tutor **
20 REM ** Andrew B. Heptonstall **
30 REM ** August 4th. 1984 **
40 ONERROR GOTO 40
50 $KEY10 OLD:MRUNIM
60 MODE 7
70 CLEAR
80 forever=FALSE
90 PROCinit
100 PROCllevel
110 REPEAT
120 PROCCrandomtimes
130 MODE1
140 PROCmain
150 IF NOT correct THEN MODE1:PROCmain
160 UNTIL forever
170 DEF PROCinit
180 PROCCarray
190 PROCname
200 ENDPROC
210 DEF PROCCarray
220 ENVELOPE 1,2,0,0,0,1,1,1,126,
    -2,-2,-2,126,100
230 DIM A$(12)
240 FOR AX=1 TO 12
250 READ A$(AX)
260 NEXT AX
270 ENDPROC
280 DATA 5 past,10 past,quarter past,20
    past,25 past,half past,25 to,20 to,qua
    rter to,10 to,5 to," o'clock"
290 DEF PROCname
300 CLS
310 FOR AX=0 TO 1
320 PRINTCHR$141;CHR$131;SPC(6);
    "The Time Tutor"
330 NEXT AX
340 PRINTCHR$129;"You must now
    type in your name."
350 PRINTCHR$129;"(And then press RETURN)"
360 PRINT ""
370 INPUT "What is your name",N$
380 ENDPROC
390 DEFPROCllevel
400 CLS
410 FOR AX=0 TO 1
420 PRINTCHR$141;CHR$131;SPC(6);

```

```

"The Time Tutor"
430 NEXT AX
440 PRINTCHR$129;SPC(2);
    "What level do you want?"
450 PRINTCHR$130;SPC(1);"Level
    1: Hours only"
460 PRINTCHR$130;SPC(1);"Level 2:
    Half and quarter past"
470 PRINTCHR$130;SPC(1);"Level 3:
    Any five minutes"
480 PRINTCHR$134;CHR$136;SPC(4);
    "Press 1,2 or 3"
490 $FX21,0
500 REPEAT
510 LET B$=GET$
520 UNTIL B$="1" OR B$="2" OR B$="3"
530 IF B$="1" THEN LET M%=60 ELSE M%=FALSE
540 IF B$="2" THEN LET D%=4;E%=15
550 IF B$="3" THEN LET D%=12;E%=5
560 ENDPROC
570 DEF PROCCrandomtimes
580 IF M%<>60 THEN LET M%=FNmin(D%,E%)
590 LET H%=FNhour(12)
600 ENDPROC
610 DEF PROCmain
620 VDU 23;8202;0;0;0;
630 PROCColours
640 PROCClock
650 PROCHands
660 PROCCchoose
670 PROCAnswer
680 ENDPROC
690 DEF PROCColours
700 VDU 19,1,6,0,0,0
710 VDU 19,2,2,0,0,0
720 VDU 19,0,4,0,0,0
730 ENDPROC
740 DEF PROCClock
750 PRINTTAB(15,0);"Time Tutor"
760 LOCAL var1%,var2%,var3%
770 MOVE 450,900
780 FOR V%=0 TO 366 STEP 12
790 LET X%=SIN(RAD(V%))*400+450
800 LET Y%=COS(RAD(V%))*400+500
810 DRAW X%,Y%
820 NEXT V%
830 VDU 5

```

Continued over the page


```

840 FOR AX=1 TO 12
850 LET X%=FNx (AX)
860 LET Y%=FNy (AX)
870 MOVE X%+450,Y%+500
880 DRAW (X%*.9)+450,(Y%*.9)+500
890 MOVE (X%*1.1)+450,(Y%*1.1)+500
900 PRINT AX;
910 NEXT AX
920 VDU 4
930 ENDPROC
940 DEF PROCchands
950 BCOL 0,1
960 LOCAL V1%,V2%,V3%,V4%
970 LET X%=FNx (M%/5)
980 LET Y%=FNy (M%/5)
990 IF (M%>35 AND M%<55) OR (M%>5 AND M%<25)
THEN LETV1%=450:V2%=450:V3%=470:V
4%=530 ELSE LETV1%=480:V2%=420:V3%=500:V4%=500
1000 MOVE V1%,V3%
1010 MOVE V2%,V4%
1020 PLOT 85,X%+450,Y%+500
1030 BCOL 0,2
1040 LET X%=FNx (H%)
1050 LET Y%=FNy (H%)
1060 IF (H%>7 AND H%<11) OR (H%>1 AND H%<5)
THEN LET V1%=450:V2%=450:V3%=470:V4
%=530 ELSE LET V1%=480:
V2%=420:V3%=500:V4%=500
1070 MOVE V1%,V3%
1080 MOVE V2%,V4%
1090 PLOT 85,(X%*.6)+450,(Y%*.6)+500
1100 ENDPROC
1110 DEF PROCchoose
1120 LET TX=0
1130 LOCAL V1%,V2%,V3%,V4%
1140 IF M%=60 THEN LET V1%=60:
V3%=60:PROCchimes:80TO1170
1150 LET V1%=FNmin (D%,E%)
1160 LET V3%=FNmin (D%,E%)
1170 REPEAT
1180 LET V2%=FNhour (12)
1190 LET V4%=FNhour (12)
1200 UNTIL H%<>V2% AND H%<>V4% AND V2%<>V4%
1210 PROCtime (M%)
1220 LET M%=TX
1230 LET M%=A% (TX)
1240 PROCtime (V1%)
1250 LET V1%=TX
1260 LET V1%=A% (TX)
1270 PROCtime (V3%)
1280 LET V3%=TX
1290 LET V3%=A% (TX)
1300 PROCprint
1310 ENDPROC
1320 DEF PROCchimes
1330 RESTORE 1390
1340 FOR AX=1 TO 8
1350 READ pitch,duration
1360 SOUND 1,1,pitch+48,duration
1370 NEXT AX
1380 ENDPROC
1390 DATA 61,10,33,10,41,10,13,20
1400 DATA 13,10,41,10,49,10,33,10
1410 DEF PROCtime (Time)
1420 LET TX=Time/5
1430 ENDPROC
1440 DEF PROCprint
1450 REPEAT
1460 LET Y1%=(RND (3)*3)
1470 LET Y2%=(RND (3)*3)
1480 LET Y3%=(RND (3)*3)
1490 UNTIL Y1%<>Y2% AND Y2%<>Y3%
AND Y3%<>Y1%
1500 COLOUR 2
1510 COLOUR 131
1520 PRINTTAB (26,5);"1.";
TAB (26,8);"2.";TAB (26,11);"3."
1530 COLOUR 1
1540 IF V3%=12 THEN PRINTTAB (28,2+Y1%);V4%;
V3% ELSE PRINTTAB (28,2+Y1%);V3%;TAB (
32,3+Y1%);V4%
1550 IFV1%=12 THEN PRINTTAB (28,2+Y2%);V2%;V1%
ELSE PRINTTAB (28,2+Y2%);V1%;TAB (3
2,3+Y2%);V2%
1560 IF M%=12 THEN PRINTTAB (28,2+Y3%);H%;M%
ELSE PRINTTAB (28,2+Y3%);M%;TAB (32,3
+Y3%);H%
1570 ENDPROC
1580 DEF PROCAnswer
1590 LET M%=M%*5
1600 COLOUR 0
1610 COLOUR 129
1620 LET Y3%=Y3%/3
1630 PRINTTAB (28,18);"Please press"
1640 PRINTTAB (28,19);"1,2 or 3 "
1650 PRINTTAB (28,20);"to choose "
1660 PRINTTAB (28,21);"the right "
1670 PRINTTAB (28,22);"answer. "
1680 $FX21,0
1690 REPEAT
1700 G$=GET$
1710 UNTIL G$="1" OR G$="2" OR G$="3"
1720 CLS
1730 PRINTTAB (15,1);"Time Tutor"
1740 IF Y3%<>(ASC (G$)-48) THEN GOSUB
1750 ENDPROC
1840 ELSE GOSUB 1760
1760 PRINT'TAB (5);"Well done ";N$;"
you choose the"
1770 PRINT" correct answer."
1780 PROCTick
1790 PRINT'" Press the ANY KEY
to play again"
1800 $FX21,0
1810 LET G$=GET$
1820 LET correct=TRUE
1830 RETURN
1840 PRINT'TAB (8);"Sorry ";N$;"
you choose the"
1850 PRINT " wrong answer."
1860 PROCcross
1870 PRINT'" Press ANY KEY to try again"
1880 $FX21,0
1890 LET G$=GET$
1900 LET correct=FALSE
1910 RETURN
1920 DEF PROCTick
1930 BCOL 0,0
1940 MOVE 448,192
1950 DRAW 640,0
1960 DRAW 1024,512
1970 ENDPROC
1980 DEF PROCcross
1990 BCOL 0,0
2000 MOVE 448,576
2010 DRAW 768,64
2020 MOVE 448,64
2030 DRAW 768,576
2040 ENDPROC
2050 DEF PROCpause (P%)
2060 TIME=0
2070 REPEAT
2080 UNTIL TIME>P%
2090 ENDPROC
2100 DEF FNx (x)=SINRAD (x*30)*400
2110 DEF FNy (y)=COSRAD (y*30)*400
2120 DEF FNhour (x)=RND (x)
2130 DEF FNmin (x,y)=RND (x)*y

```


ALSO JUST
OUT

MICROMEGA

A new and richly devious world
for the 48k Spectrum — £6.95



Where netherbeast Grako is building his power, There's much to discover and dangers abound. Free-moving agents may help you or hinder, But might be befriended if ways can be found. The alchemist lore-work was false and a failure, But renders good service in different vein, And vanquished aggressors might be your protector, In perilous places of dark, death and pain. Of devious problems and magical tasks, This song is a warning, a riddle, a clue. To Caraland's saviour it offers a little, So mark well its lines for the saviour is you...

Selected titles
available through
larger branches of



spectrum

WOOLWORTH

W.H. SMITH



At last — a classic interactive text and
graphics adventure from MICROMEGA!

3D COMPUTERS

THE HOME COMPUTER SPECIALISTS

SEPTEMBER BARGAINS

**BBC MODEL B
WITH 5 SOFTWARE
CASSETTES
£365.00 INC. VAT**

**ACORN ELECTRON,
WITH PLUS 1
INTERFACE
£229.00 INC VAT**

230 TOLWORTH RISE SOUTH TOLWORTH
SURREY KT5 9NB TEL: 01-337 4317



Branches at:

Sutton 01-642 2534
Ealing 01-992 5855
Newbury 0635-30047
Luton 0582-458575



LIGHT TO THE POINT



SPECTRUM 48K/COMMODORE 64

£17.25

DRAGON/TANDY

£11.50

inclusive
NO INTERFACE REQUIRED

Discover the exciting world of creating your own graphics on screen.

The Trojan Light Pen will draw boxes, circles, lines, freehand pictures, save and load pictures with full erase facility.

All in Hi-Res screen in any of 4 colours for the Dragon/Tandy, 8 colours for the Spectrum, and 16 colours for the Commodore 64.

For educational or leisure use.

DEALER ENQUIRIES WELCOME

TROJAN

Micro Computer Software & Accessories

Send cheque/P.O. to:
TROJAN PRODUCTS

166, Derlwyn, Dunvant, Swansea SA2 7PF
Tel: (0792) 205491.

ZX80/ZX81

and

Spectrum

Fair

AT



on
Saturday
6th October

PUDSEY CIVIC CENTRE

DAWSONS CORNER, STANNINGLEY

NR LEEDS

(midway between Leeds and Bradford)

Admission: Adults 75p, Children 50p
10am till 5pm

HARDWARE, SOFTWARE, BOOKS AND
MAGAZINE — EVERYTHING FOR ZX USERS

For tables contact Mike Donnachie 0532-552854
after 4pm

A Fair Deal For Our Advertisers

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

ABC

The Hallmark of Audited Circulation

COULD THIS BE YOUR PROGRAM?



Is your program good enough to fill this spot?

Will your game be the next No. 1 hit?

Are you looking for **worldwide** marketing and **top** royalties?

Are you writing for leading computers such as Spectrum, CMB-64, Vic 20, ZX81, Amstrad, BBC etc?

Answer yes to any of these questions and we would like to hear from you.

Send your program on tape together with full instructions for fast evaluation. Be sure to include computer type, memory, peripherals used and your name, address and telephone number.

R&R

SOFTWARE

R&R Software Ltd. 5 Russell Street Gloucester GL1 1NE
Tel (0452) 502819

Open Forum is for you to publish your programs and ideas. Take care that the listings you send in are all bug-free. Your documentation should start with a general description of the program and what it does and then give some detail of how the program is constructed.

Plotter

on Commodore 64

This program should also work on the unexpanded Vic 20. If you have a 1520 plotter/printer this program allows you to draw and doodle directly onto the paper without having to work out lots of co-ordinates.

You can draw in 8 directions by using the keys mentioned in the program. By keying S you can change the pen colour or the mode, of which there are two. While in mode M your pen will just move about without making any marks but in mode D lines will be drawn.

Directional movement of the pen is given using the main compass points.

Program notes

3-120 Initialise and set screen display.

130-230 Check for key depression and move to appropriate sub-routine.
240-250 Draws or moves to next point.
1000-1020 North-west movement.
2000-2020 North.
3000-3020 North-east.
4000-4020 West.
5000-5020 East.
6000-6020 South-west.
7000-7020 South.
8000-8020 South-east.
9000-10110 Change colour or mode.

Variables

M\$ Mode.
C\$ Colour.
AS, RS, BS Input variables.
X,Y Co-ordinates of pen.
OS Operation being performed.
H Maximum height of drawing.

```
1 REM "DOODLE" BY SARAH COTTON
2 REM FOR USE ON THE 1520 PLOTTER
  /PRINTER
3 POKE650,255
4 M$="D":C$="BLACK"
10 OPEN1,4,1:OPEN2,4,2:PRINT#2,"0"
40 INPUT"XXXXXXXXXXXXHEIGHT
(50-999)";H
45 IFH<50ORH>999THEN40
50 PRINT#1,"M":0,-H:PRINT#1,"I"
70 PRINT"X"
80 PRINT"QQQCOLOUR:";C$
```

```
85 PRINT"QQQMODE:";M$
87 PRINT"QQQOPERATION:";O$
90 PRINT"Q QWE"
100 PRINT" A D"
110 PRINT" ZXC"
120 PRINT"QQS-COLOUR/MODE"
130 GETA$
140 IFA$=""THEN130
150 IFA$="Q"THENGOSUB1000
160 IFA$="W"THENGOSUB2000
170 IFA$="E"THENGOSUB3000
180 IFA$="A"THENGOSUB4000
190 IFA$="D"THENGOSUB5000
```

Arcade Avenue



Freddy's cat

The *Jetset Willy* postbag is bulging, as usual, with some particularly interesting letters this week. First of all thanks to James Blair of Coleraine and David Whittall of Birmingham for your letters but the *Pokes* are a bit too familiar to publish again. Stephen Cargill of Southport has sent in the following small program for owners of Interface 1 which stops the crash when the pause key is pressed. To be loaded at 8B1F hex or 35615 decimal.

Hex	Assembly
21 E2 85	LD HL, 85E2
01 FE BF	LD BC, BFFE
ED 78	IN, A, (C)
2F	CPL

ES IF AND IF
The problem occurs because port 0 is read when the key is pressed. The new program provides an improved method of testing the keyboard. To load it type *Merge* "" (Enter) — load the basic then type *Clear* 32767:Load "" Code (Enter). Then enter the hex and type *Save* "Jetset" Line 1:Save "jsw" Code 32768, 32768 (Enter)". For those of you with no hex loader I have converted Stephen's hex — *Poke* 35615 to 35625:33, 226, 133, 1, 254, 191, 237, 120, 47, 230, 31.

Along similar lines, Graeme Carrot of Gosforth has sent in *Poke* 36635, 239 for owners of Interface 2. He also gives us the following — *Poke* 36477, 1 makes Willy immune when falling, *Poke* 38240, 0 kills off Maria, *Poke* 36358, 0 "turns you into zebedee to go bouncing around the mansion (though you end up in the off licence or stuck in the sand of the beach)", *Poke* 36545, 0 makes

the Banyan Tree easier, *Poke* 34795, 47 makes you start in an empty room above the conservatory roof and *Poke* 41983, 255 allows the finishing routine to be seen with only one object collected.

In his fascinating letter he goes on "to clear up the mystery of the names used — Nomen Luni is a mickey take of Imagine's *Zzoom* logo, and a 'Quirkasleeg' is a strange chant expressed while lying on your back like a dead dog in the presence of dead furry animals (see 'The Adventures of Fat Freddy's Cat No. 5').

Graeme finishes: "I eagerly await the CBM 64 version with four extra rooms, and more from the Matthew Smith stable — but please add an 'Attic' feature — it's so much fun trying to get round it!" However, I should point out I have had some letters from very angry people who do not agree with him. One signed "A frustrated JSW player" was very bitter

indeed about the fact that the game could not be completed "honestly" and that since you had to *Poke* around to finish the game there is no proof that the winners "moved miner Willy one inch".

Finally for this week a letter and tape from Chris Jenkins and Paul Rhodes of 104 Vetrnor Gardens, Luton, Beds, LU3 35W who are offering for sale (I don't know how much) a JSW editor — a marvellous utility that allows you to redefine everything including the room layout, the map of the mansion, the position shape and speed of the arrows. **Tony Kendle**

The Arcade Corner is a new section for anyone who enjoys playing arcade games. If you have any comments, from playing tips on difficult games or programs you'd particularly like to praise (or blame!) then write to: Tony Kendle, Arcade Avenue, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.


```

200 IFA$="Z" THEN GOSUB 6000
210 IFA$="X" THEN GOSUB 7000
220 IFA$="C" THEN GOSUB 8000
230 IFA$="S" THEN GOSUB 9000
240 IFM$="D" THEN PRINT#1,"J";X,Y
250 IFM$="M" THEN PRINT#1,"R";X,Y
260 GOTO 70
1000 IFX+15<0 OR Y+15>H THEN RETURN
1010 X=X-15:Y=Y+15
1020 O$="NORTH-WEST":RETURN
2000 IFY+15>H THEN RETURN
2010 Y=Y+15
2020 O$="NORTH":RETURN
3000 IFX+15>460 OR Y+15>H THEN RETURN
3010 X=X+15:Y=Y+15
3020 O$="NORTH-EAST":RETURN
4000 IFX-15<0 THEN RETURN
4010 X=X-15
4020 O$="WEST":RETURN
5000 IFX+15>460 THEN RETURN
5010 X=X+15
5020 O$="EAST":RETURN
6000 IFY-15<-999 OR X-15<0 THEN RETURN
6010 Y=Y-15:X=X+15
6020 O$="SOUTH-WEST":RETURN
7000 IFY-15<-999 THEN RETURN
7010 Y=Y-15
7020 O$="SOUTH":RETURN

```

```

8000 IFX+15>460 OR Y-15<-999 THEN RETURN
8010 X=X+15:Y=Y-15:RETURN
9000 PRINT"s"
9010 PRINT"QQPLEASE INPUT NUMBER"
9020 PRINT"QQF REQUIRED OPERATION"
9030 PRINT"QQQ1-DRAW"
9040 PRINT"QQ2-MOVE"
9050 PRINT"QQ3-CHANGE COLOUR"
9060 GETB$:IFB$="" THEN 9060
9070 IFB$="1" THEN M$="D"
9080 IFB$="2" THEN M$="M"
9090 IFB$="3" THEN 10000
9100 RETURN
10000 PRINT"sQQINPUT COLOUR NUMBER:"
10010 PRINT"QQQ0-BLACK"
10020 PRINT"QQ1-BLUE"
10030 PRINT"QQ2-GREEN"
10040 PRINT"QQ3-RED"
10050 GETR$:IFR$="" THEN 10050
10060 PRINT#2,VAL(R$)
10070 IFR$="0" THEN C$="BLACK"
10080 IFR$="1" THEN C$="BLUE"
10090 IFR$="2" THEN C$="GREEN"
10100 IFR$="3" THEN C$="RED"
10110 RETURN

```

Plotter
by Sarah Cotton

Microradio

GW6JJN



Cellular radio

Some of you may remember reading the Microradio article on Cellular Radio a few weeks ago and may have some understanding regarding the complexities involved.

If not, you will be like most people in thinking that it is just an extension to the normal radiophone system, but many times better.

The whole concept of Cellular Radio is very new and revolutionary. To have a tele-

phone in a car is not very new, perhaps, but Cellular Radio offers much more than this. Imagine having, wherever you go, a small phone which you can use to speak to anyone both through the cellular system or through the public telephone system. Of course, the whole thing is handled by computers and you don't need to know what a cell is just to Dial-a-disc.

You don't need to know that as you move from cell to cell, the frequency of your transmission changes automatically within two milliseconds and automatic digital systems track your every move... all very futuristic.

Two companies have recently been licensed by the government to introduce this incredible system over the next few months. The first is Telecom Securicor Cellular Radio which will operate a system called Cellnet. Telecom Securicor is composed rather obviously of

British Telecom who owns 51% and Securicor who owns the other 49% of the firm.

The second company to get a licence is Racal. Not a household word, at least not until they started advertising on television recently just so that everyone will know who they are when the cut-throat competition begins in earnest.

So what is on offer from these firms? Telephone calls from anywhere to anywhere, any time, any place is one thing. Another is the ability to send data at 600 bits per second so anyone can talk to a computer. What this means in practice is that you could set out on a car journey, tell the computer where you are going and the computer will work out the best route knowing of course where the snarl-ups are.

Racal say this could save the country nearly two thousand million pounds a year which is what they estimate is wasted on fuel and road accidents, etc.

The whole idea of computer communications on the move is taking off in a big way. Under the government's programme of research into this very subject are big names like Racal, Cambridge University and several other universities, Acorn Computers, BL Technology (of talking Maestro fame), Shell and BP and not least, the RAC who sees the potential for its members.

It all sounds very expensive, but both Telecom Securicor and Racal deny this. The system already costs less than the current radiophone and the price is falling by the hour.

Ray Berry GW6JJN

This series of articles is designed for radio and microcomputer enthusiasts alike. If you have any queries that you want answered, hints and tips to share, or topics that you would like to see covered, write to: Ray Berry, Microradio, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

Fighter

on Spectrum

In this game for the 16K machine you are the

pilot of a hovering craft. You are armed with missiles and have a total of 5 aircraft. If you crash your aircraft or fire too late you will be destroyed. Keys 6 & 7 manoeuvre the aircraft in the direction of the cursors, 0 fires the missile. Your score is displayed every

time you crash or hit a plane.

Graphics

120 — Graphic ABBA
140 — Graphic DBBA
250 — Graphic J

```

1 GO SUB 1000
2 PRINT "SIDEWINDER": PRIN
T: PRINT "Hill the USSR
Miss with SIDEWINDER:
5: PRINT "647 for
up/down Fire missile-0"
3 PAUSE 300
5 BORDER 5: PAPER 5: INK 0
10 LET S=0
20 LET C=0
30 LET A=1
40 LET FX=27
50 LET FY=10
60 LET EX=0
70 LET EY=INT (RND*20)+1
80 LET C=C+1
90 LET Y=FY
100 LET X=FX
110 CLS
120 PRINT AT FY,FX;" "
130 IF Y=EY AND (X=EX+1 OR X=EX-1
OR X=EX+3) THEN GO TO 270
140 PRINT AT EY,EX;" "
150 LET EX=EX+2
160 IF EX>27 THEN GO TO 60
170 LET AS=INKEY$
180 IF AS="6" AND FY<20 THEN LE
T FY=FY+1
190 IF AS="7" AND FY>0 THEN LET
FY=FY-1
200 IF AS="0" OR X<27 THEN LET
X=X-1
210 IF AS="1" THEN GO TO 500
215 PAUSE 3
220 IF X<27 AND X>0 THEN : BEEP
.01,10: GO SUB 250
230 IF X<27 AND X>EX THEN GO TO
110
240 GO TO 90
250 PRINT AT Y,X;" "
260 RETURN
270 IF EX=23 THEN PRINT AT 0,0
"AIROCRRAFT DESTROYED."
280 LET S=S+1
290 IF EX>23 THEN PRINT AT 0,0:
"YOU DESTROY ATTACKING AIROCRRAFT"
300 PRINT "YOU ARE ALSO DESTROYED."
N: "S: "AIROCRRAFT":
310 IF C-S=0 OR C-S>1 THEN PRIN

```

```

T TAB 16;C-S;" HAVE ESCAPED."
320 IF C-S=1 THEN PRINT TAB 16;
C-S;" HAS ESCAPED."
330 FOR N=1 TO 600
340 NEXT N
350 IF EX>23 THEN GO TO 370
360 GO TO 60
370 LET A=A+1
380 IF A=6 THEN GO TO 440
390 PRINT
400 PRINT "DO YOU WISH TO SCRAM
BLE" "FIGHTER NO.":A;"?(Y/N)"
410 INPUT B$
420 IF B$(">") THEN GO TO 490
430 GO TO 60
440 PRINT
450 PRINT "ALL FIGHTERS HAVE BE
EN SCRAMBLED": "DO YOU WISH TO TR
Y AGAIN? (Y/N)"
460 INPUT C$
470 IF C$(">") THEN GO TO 490
480 RUN
490 CLS
500 STOP
1000 FOR N=0 TO 7: READ A: POKE
USR "A":N,A: NEXT N
1010 DATA BIN 0,BIN 0,BIN 0,BIN 0,BIN
0,BIN 00001110,BIN 00011011,BIN
01111111,BIN 11111111
1020 FOR N=0 TO 7: READ A: POKE
USR "B":N,A: NEXT N
1030 DATA BIN 0,BIN 0,BIN 0,BIN 0,BIN
0,BIN 0,BIN 0,BIN 11111111,BIN 1
11111111
1040 FOR N=0 TO 7: READ A: POKE
USR "D":N,A: NEXT N
1050 DATA BIN 0,BIN 0,BIN 0,BIN 0,BIN
0,BIN 00111000,BIN 01101100,BIN
11111110,BIN 11111111
1060 FOR N=0 TO 7: READ A: POKE
USR "F":N,A: NEXT N
1070 DATA BIN 10000000,BIN 11000
000,BIN 11100000,BIN 11110000,BI
N 11111000,BIN 11111100,BIN 1111
1111,BIN 11111111,BIN 0
1080 FOR N=0 TO 7: READ A: POKE
USR "J":N,A: NEXT N
1090 DATA BIN 0,BIN 0,BIN 0,BIN 0,BIN
01000011,BIN 11111111,BIN 010000
11,BIN 0,BIN 0
1100 RETURN

```

Fighter
by S Eaton

Baud Walk



Net gain

The battle of the database, forecast some time ago in Baud Walk now begins in earnest with the launch at the PCW Show of Compunet.

Compunet — which initially is only for Commodore 64 owners, but hopes to add other machines to its stable next year — sacrifices speed of response time for true interactive capabilities.

Its rival in the marketplace, Micronet 800, is just launching its database for the 64. The response time speed on Micronet's system is superior to Compunet, but lacks the degree of flexibility.

That flexibility is what Compunet is banking on; users of the service can upload their own information completely error corrected, thus potentially the half a million 64 owners can exchange files, sell to each other, even become mini publishers — and what they charge is entirely up to them.

There was little to see on Compunet at the launch, not surprising as it's really a user-driven system with the free-for-all area labelled The Jungle still being formulated. What Compunet can do is offer commercial software suppliers telesoftware security. Each modem has a unique identity and downloaded software can only be run with that modem in place.

Nick Green, of Compunet (it's really evolved from an educational brainchild of his called Petnet) says over a dozen software houses are contracted, such as Llamasoft, Severn and Commodore themselves.

Whether all this software finally arrives has yet to be proven. Certainly, Micronet found latest releases hard to come by — but Commodore's market influence may give Compunet an edge.

It costs £99.99 to buy the Commodore modem, which transmits at 1200/75 full duplex and 1200/1200 half duplex, and that includes a year's free subscription to the system! Compunet charges users for storing information and takes commission from anything you sell to other users. Its mailbox charge of 10p is particularly prohibitive.

The terminal software offers a good editing system in an 8k ROM and the network scrolls across the screen a type of 'duck shoot' menu — you hit the space bar to trap an option which ranges from help to store, view, etc.

Information is displayed on your 64 in hi-resolution, and that certainly is more attractive than the teletext character dis-

play of most viewdata systems. Commodore's Mark Horne commented, "Until now no manufacturer has done more than scratch the surface of true interactive communications."

Whether Compunet can deliver what it promises — good software, teleshopping from Comp-U-card and a bank for home financial services/transactions — remains to be seen. Further information from Compunet Teleservices, Metford House, 15-18 Clipstone Street, London W1P 5DS or VicSoft, Commodore UK, 1 Hunters Way, Weldon, Corby, Northants.

Robin Wilkinson

Baud Walk is a new weekly column with news on networking, databases, reviews of modems and software and points of contact for information.

Any readers with experience of networking are asked to send their experiences or news of services to Robin Wilkinson, Baud Walk Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

He can also be contacted on Prestel mailbox 019993737.

Moving Graphics

on BBC

This program shows how VDU 19 can be

used to make things move. The computer first draws an oval, then horizontal and vertical lines over it. When the lines are completed they will start to move, changing direction and colour every so often.

Program notes

Lines 10-80	Work out variables
Lines 90-180	Main program
Procovel	Draws oval
Proclines	Draws horizontal lines
Proclines 2	Draws vertical lines
Procmove	Moves lines

```

10 MODE4
20 PRINTAB(12,10),"PLEASE WAIT"
30 DIM S(90),C(90)
40 T%=0
50 FOR A=0 TO RAD 360 STEP RAD 4
60 S(T%)=SIN(A):C(T%)=COS(A)
70 T%=T%+1
80 NEXT
90 REM=====MAIN PROGRAM=====
100 MODE 2
110 REM
120 C%=7:T1%=0
130 R%=-400:R1%=600
140 PROCVEL
150 PROCLINES
160 PROCLINES2
170 PROCMOVE
180 END
190 REM=====PROCEDURES=====
200 DEFPROCVEL
210 GCOL 0,1
220 VDU 29,640,512
230 MOVE 0,0
240 FOR A%=0 TO 90 STEP 2
250 MOVE 0,0
260 PLOT 85,S(A%)*600,C(A%)*400
270 NEXT
280 ENDPROC
290 REM=====HORIZONTAL LINES=====
300 DEFPROCLINES
310 REPEAT
320 MOVE 600,0
330 C%=C%+1:IF C%=16 THEN C%=7
340 GCOL 0,C%
350 FOR T%=23 TO 67 STEP 3
360 DRAW S(T%)*600,C(T%)*R%

```

```

370 NEXT
380 R%=R%+30
390 UNTIL R%>400
400 ENDPROC
410 REM=====VERTICAL LINES=====
420 DEFPROCLINES2
430 REPEAT
440 MOVE 0,400
450 C%=C%+1:IF C%=16 THEN C%=7
460 GCOL 0,C%
470 FOR T%=0 TO 45 STEP 3
480 DRAW S(T%)*R1%,C(T%)*400
490 NEXT
500 R1%=R1%-40:UNTIL R1%<-600
510 ENDPROC
520 REM=====MOVING SECTION=====
530 DEFPROCMOVE
540 C%=7:RN%=RND(6):RN1%=RND(6)
550 REPEAT
560 T1%=T1%+1
570 C%=C%+1:IF C%=16 THEN C%=7
580 VDU 19,C%,RN%,0,0,0
590 PAUSE=INKEY(7)
600 VDU 19,C%,RN1%,0,0,0
610 UNTIL T1%=100
620 T1%=0:RN%=RND(6):RN1%=RND(6)
630 REPEAT
640 T1%=T1%+1
650 C%=C%-1:IF C%=6 THEN C%=15
660 VDU 19,C%,RN%,0,0,0
670 PAUSE=INKEY(7)
680 VDU 19,C%,RN1%,0,0,0
690 UNTIL T1%=100
700 T1%=0:RN%=RND(6):RN1%=RND(6)
710 GOTO 550
720 ENDPROC

```

Moving Graphics
by Mark Dixon

POPULAR Computing WEEKLY

★ CLASSIFIEDS ★

- ★ Popular Computing Weekly was voted magazine of the year by the C.T.A.
- ★ It is Britain's only weekly home computer magazine with a published Audit Bureau of Circulation sales figure.
- ★ It has a classified section that is now required reading for everyone with an interest in small micros, or who wants to buy or sell: SOFTWARE ★ UTILITIES ★ ACCESSORIES ★ SERVICES ★ HARDWARE ★ HIRING ★ CLUBS ★ RECRUITMENT ★
- ★ £6 per SCC semi-display, 25p per word lineage.
- ★ 6 day copy date.

CALL DIANE DAVIS ON 01-437 4343 FOR
AN IMMEDIATE QUOTE.

Popular Computing Weekly, Sunshine,
12/13 Little Newport Street, London WC2R 3LD



SPECTRUM & BBC

POOLS PREDICTOR

WITH

11,000
MATCH
DATABASE

Now in its 3rd successful season, Mayday Software's Pools Predictor has been made even more powerful with a new and unique 11,000 match database. SEVEN separate forecasting techniques have been combined to give you the best forecasts yet. Still as easy to use as ever, you can tune the program yourself to improve forecasts as the season progresses.



RACING ANALYSER

Using the racecard from your daily paper, this easy to use program will combine 7 different horse race factors to analyse any race, flat or NH.

BOTH PROGRAMS FOR ONLY **£8.99**

MAYDAY
SOFTWARE

181 PORTLAND CRESCENT
STANMORE, MIDDX HA7 1LR

Tony Bridge's Adventure Corner



LOM feature

Last week, I looked at *Lords of Midnight*, and ended up promising help. "Never in reviews of the game have I seen any clues," says Paul Newton of Swindon. He seems to be having a lot of trouble. His letter was quite long, but he has two main problems — first, once Morkin or Fawkin have the Ice Crown, there seems to be no option offered by the program to destroy it. This wouldn't be so bad, as the game may also be won by defeating the armies of Doomdark — but Paul finds that, even with a much larger army, the Free are defeated.

First things first, Paul — as you pointed out, Fawkin the Skulkrin can also destroy the Ice Crown (find him at MoonHenge, which is West of the Forest of Lothar, between the Downs of Mirron and the Mountains of Toomog, in the Province of the Moon), and this information can be gained by asking at one of the many Towers of the Wise. You may also find other characters who can destroy it, such as Lorgrim the Wise (find him up in the top North-East corner of the Map of Midnight, by Lorchenge, on the Plains of Fadrath) and Farflame the Dragonlord, who is very weak. You'll find this character at the Tower of Coroth.

However, it seems, from what I have been told, that you need to get at least one friend to go with Morkin (although Gregg Reid of Dundee reckons that you need all four); although there is a clue about a certain lake that will also destroy the ice Crown, so if

Morkin is alone, he may still be able to destroy the Ice Crown by finding the Lake.

As for the strategic problems, I'm reliably informed (by Keir Thorpe from Weybridge, among others), that you must keep Luxor away from Citadels and your main armies — he is the one that the Foul can detect, and they want his blood! Keep him on the move for this reason.

The strategic game must be embarked upon as well the adventure quest, as the armies that you gradually recruit will act as a diversion for the Foul forces, keeping them, you hope, away from Morkin and his companions. If the quest for the Ice Crown proves a failure, then you should still be in a position to press on with a military build-up.

Several other hints have been passed on to me — Farflame, for instance can be very useful, because, as well as being immune from the Ice Fear (or maybe because of this), he can travel much faster than the other characters, who seem to be limited to about eight moves per day. Beware Snowhalls and Kenges — there you will find the Hand of Dark, which "brings death to the day" for the finder. Don't rely too heavily on finding lakes to refresh your characters; although your forces will be "utterly invigorated" after drinking at a lake, it is a day or two before it can be used again.

Don't rely too much, either, on the Lord of Brith — "You'll find", says Keir, "that he may well become utterly afraid at the most unfortunate times, just before a battle and so on. I have also discovered a possible bug — when some of the characters, particularly Rorthron and Luxor, move to some locations (Liths, for example), night falls, although when you Look again, it is still day for them. Also, can someone please tell me why Morkin cannot recruit anyone South of Coroth?" Keir has also found some locations not marked on the map — for example, the Citadel of Dawn due South of Marakith, held by the Free, and the Citadel of Gorgath on the Plains of Walethor, held by the Foul.

One thing that would seem to be worthwhile doing, is to make a detailed plan of your actions, thus keeping a check on the movements of all the forces at your command — and those of Doomdark, if possible. There are so many that you cannot possibly hope to remember where everyone is.

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!

As Dave Wagner, of Acton in London, says: "Despite being not, in any way, a wargame enthusiast, I find it totally enthralling. I have never felt so involved before, and can scarcely wait for my adventuring partner to get back from holiday so we can really get going — controlling and correlating the efforts of so many characters is very hard work and much better shared, I'm sure. I really think this is the best adventure yet."

Some final tips from Steven Stoner, who writes from Southampton. He succeeded in classic fashion, that is, with a two-forked prong — a build-up of forces in the south, to take attention away from Morkin in the north. He says, "When travelling, baddies such as ice trolls and wolves are best steered around, as trying to kill lots of these can cause careless loss of life. Avoid taking armies through mountain ranges, which exhausts the troops and renders them useless for battle. Before battle, always Think to find out if you are outnumbered, and by how much. If the odds look favourable, go for it (bearing in mind earlier comments about Luxor's presence — TB). Seek at every village, lith and so on, as it usually proves worthwhile. At the very beginning, try to find the Lord of Shadows, hidden somewhere in the Forest of Shadows, surrounding the tower of the Moon."

Steven finishes by hoping that *Doomdark's Revenge*, the first sequel to *Midnight* will not be too long in appearing — I don't think you're alone there, Steven!

All in all, it seems that, if you plug away at *Lord of Midnight*, success should not be far behind. So many ways of winning present themselves, however, that the game will take a long while to get stale.

Congratulations to all those lucky people who have finished the game — Gregg Reid puts it all down to his reliance on that greatest of all philosophies, "Life is but a cheese pizza".

To finish off, Gregg has a complaint about Beyond Software. "Once I'd completed the game, I phoned the Beyond Hot-Line, tried in vain for a week, and also sent a letter with SSAE. No answer from the phone or the letter." Come on, Beyond, if you're going to hold a competition, you could at least let everyone know how they've done. Many people have bought your game and you should expect to have quite a number of letters about it — don't spoil what is one of the classic games of all time, for any micro!

This series of articles is designed for novice and experienced Adventurers alike. Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter. So, if you have an Adventure you want reviewed, or if you are stuck in an Adventure and cannot progress any further write to: Tony Bridge, Adventure Corner, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

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,

Adventure.....on (micro).....
Problem.....
Name.....
Address.....

You really can't go wrong with any Level 9 game as they are really brilliant

CRASH MICRO SEPT '84.

✓ Whichever machine you own, if you have the vaguest tendency towards adventure playing then you must try one of these games (unfortunately you'll probably end up wanting to buy the lot!).

Computing Today, August 84

✓ To me, all Level 9 adventures create a remarkable atmosphere because the descriptions sound so life-like. This is where so many other adventures fail.

Crash, July 84

✓ But it's not just the size of the game it's the quality as well that is astonishing ... scenes to fire the imagination.

PCG, April 84

✓ As in all Level 9's adventures, the real pleasure comes not from scoring points but in exploring the world in which the game is set and learning about its denizens.

Which Micro?, February 84

✓ (LORDS OF TIME). As we have come to expect from Level 9, the program is executed with wonderful style. Highly recommended.

PCW, 1 February 84

✓ I thoroughly recommend these Adventures, they are excellent value for money. No self-respecting Adventure-addict should be without them. I believe Level 9 are producing a series of Adventures which should be regarded as classics.

Atari User, July 84

✓ These programs run very fast and there are no frustrating pauses. Level 9 Adventures are superbly designed and programmed, the contents first rate. The implementation of Colossal Adventure is nothing short of brilliance; rush out and buy it. While you're at it, buy their others too. Simply smashing!

Your 64, June 84

✓ Level 9 - arguably the producer of the best adventure games in the UK - has done it again. LORDS OF TIME is a sparkling addition to its stable of winners.

Acorn User, July 84

✓ (SNOWBALL). This is another imaginative, massive-scaled immensely enjoyable adventure from those experts down at Level 9.

Your Computer, March 84

Return to Eden



Level 9 Computing

Available from W H Smith and good computer shops everywhere. If your local dealer doesn't stock Level 9 adventures yet, get him to contact us or: Centresoft, Microdealer UK, Ferranti & Craig, Leisuresoft, Lime Tree, LVL, PCS, R & R or Wonderbridge.

Level 9's epic adventures are now here for the AMSTRAD. Disk versions are available for the BBC (40/80 track) and Commodore 64. And, best of all, RETURN TO EDEN is ready. It's been a busy month!

RETURN TO EDEN is the long-awaited sequel to

Level 9's top-selling
Snowball adventure. Now
it's here with 220

locations, masses of puzzles, and
with pictures on the CBM and
Spectrum versions.



Cassette Disk
£9.95 £11.95

I ENCLOSE A CHEQUE/PO FOR £9.95 EACH (CASSETTE) OR £11.95 EACH (DISK) FOR BBC OR CBM 64

My name:

My address:

My micro is a:

(one of those listed below,
with at least 32K of memory).

Contact:

LEVEL 9 COMPUTING

Dept. 229, Hughenden Road,
High Wycombe, Bucks. HP13 5PG.

1. **COLOSSAL ADVENTURE.** The classic mainframe game with 70 bonus rooms.
2. **ADVENTURE QUEST.** An epic journey through Middle Earth.
3. **DUNGEON ADVENTURE.** A massive game which completes the Middle Earth Trilogy.
4. **SNOWBALL.** Save the interstar freezer, Snowball 9, in a huge space adventure with over 7000 locations.
5. **RETURN TO EDEN.** SF adventure on the weirdest planet ever. The sequel to Snowball, though you don't need to have played this.
7. **LORDS OF TIME.** A humorous romp through World History.

AMSTRAD BBC CBM64 SPECTRUM MTX ORIC 1 LYNX NASCOM ATARI

In The Beginning



The QL QClassics

Sunshine books introduce the QL QClassics, a brand-new range of superbly written, highly informative books that will help you exploit the many and varied possibilities of this eagerly-awaited new micro.

The QL QClassics are in production now for full availability in the summer. And that's definite.

Like all Sunshine books, these are more than mere manuals. Inside you'll discover ways and means to help your business, your hobby – and your future.

Look out for the Sunshine range in W.H. Smith's, Boots, John Menzies, other leading retail chains and all good bookshops. Dealer enquiries: 01-437 4343



Pre-Release QL QClassics Information.

Please send me your free Sunshine QL QClassics brochure, detailing all the books available soon.

Name

Address

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

SABRE WOLF

ULTIMATE
PLAY THE GAME

THE GREEN
ASHBY DE LA ZOUCH
LEICESTERSHIRE LE65 3JH

FOR SINCLAIR ZX SPECTRUM
£9.95



Immediate run

H. Anderson of Edgware, Middlesex, writes:

Q Having recently purchased a 48K Spectrum computer, I notice that most of the commercially produced software starts to run as soon as loading is completed, without the need for Run/Enter. I enjoy writing simple Basic programs and would like to be able to do the same. Can you please advise me on a routine to effect this immediate Run?

A You don't actually need a routine to make a Basic program 'auto-run', the secret lies in the Save command used. If you had a program called Fred that you wished to auto-run, then you would need to Save it using a statement, thus -

Save "Fred" Line.

This would cause the program to Run, starting at the first line, immediately on loading.

If you wanted the program to start at a line number other than the first one in the program (say Line 300) then the Save statement would be -

Save "Fred" Line 300.

Sales figures

Gerald Jess of Kings Lynn, Norfolk, writes:

Q I am trying to write a program to input sales figures and then print them out under customer, date, etc. What I want to do is dimension the number needed, initialise them and then look for the first empty string so as to put the latest figures in here. Using a Spectrum, I tried Dim d\$(10):For n=1 To 10:Let d\$(n)="" :Next N:For n=1 To

10:If d\$(n)="" Then Let d\$(n)="date".

This doesn't work, why not?

A The Dim statement on the Spectrum, when used with character arrays, needs two parameters.

The first one specifies how many dimensions (occurrences) there are, and the second specifies the number of characters occupied by every occurrence.

Thus, in your case you have defined an array (d\$) of 10 occurrences each of 1 character (the default) in length.

The reason that your initialisation routine does not work is that it depends on having a zero length occurrence (this is not possible on the Spectrum).

Normal string variables do not have a length defined for them, and they can therefore grow and shrink according to the needs of your program. Arrays, however must have a length associated with them, and that length never changes (no matter what the contents).

Right and left

J. R. Thompson of Warrington, writes:

Q Because the Spectrum doesn't have a Right\$ facility, I am having problems with one line of a program that I am copying from another computer's listing. Could you please explain how Right\$ works on the Spectrum, as I can't even grasp what is written in the manual about it?

The statement I am trying to convert is $x=10*(Asc(A\$-64)+Val(Right$(A\$1)))$

A As you quite rightly point out, the Spectrum does not have a Right\$ (or Left\$) facility. You will need to make use of the To operator. This allows you to specify a 'slice' of a string to be worked on, eg Let $A\$=B$(4 TO 5)$ puts characters 4 and 5 of B\$ into A\$.

To simulate Right\$ you need to code the appropriate TO clause, eg Let $A\$=Right$(B$,3)$ - takes the last three characters of B\$ and puts them in A\$. This is written as: Let $A\$=B$(Len B$-3 TO Len B$)$. To produce the effect of Left\$, you write Let

$A\$=B$(TO 5)$ - this takes the first five characters of B\$.

The statement you wish to convert could therefore be written as: Let $x=10*(Asc(A\$-64)+Val(A\$)-1 TO Len A\$)$.

Aerial signals

Stephen Coupland of Thanet, Kent, writes:

Q I would like to know how I can make an Aquarius and a black and white television send signals from an ordinary aerial. I would also like to know if I can do this without a modem or acoustic coupler?

A In order to send (or receive) signals from a computer, you need a modem. Either the direct connection, or acoustic coupler type will do for the purpose. The computer will also need an RS 232 interface. I don't know of any one who markets such an interface for the Aquarius I'm afraid. Until one appears, you will not be able to use your machine to communicate with others.

Program converter

C. Billingham of Birmingham, writes:

Q I have an Epson HX20, and my problem concerns converting programs for other computers to run on my computer. On some of the programs the Poke statement is used for such things as Poking the computer's clock, or setting the screen.

Could you please tell me if there is some way of getting these addresses? Is there a command statement that will return these addresses using a Print Chr\$ statement or something like that?

A Trying to convert programs which include

Poke (or Peek) statements is a very tricky business. As well as having to understand exactly what the purpose of each of these statements is, you need to know what the equivalent one is on the Epson (if indeed there is one).

However, if we assume that you are able to determine the function of particular Poke statements, then you will need to know exactly where the important addresses are in your machine's memory.

I am afraid that the computer will not be able to tell you what these addresses are, so you will have to discover them yourself. A good source of information would be the Complete Technical Manual for the HX20 which is obtainable from your Epson dealer priced at £27.

Royalty payments

T. C. Whalley of Peterborough, writes:

Q In the advertisement for White Lightning, it makes the point that we can market games without paying royalties. Does that mean that if another system is used (such as The Quill) we have to pay royalties to the software house supplying the games generator?

A As far as The Quill is concerned Gilsoft who market it only ask that an acknowledgement is made on any game produced, mentioning The Quill. No royalties are then payable. Most other games generators however do not state this, implying that any software produced would be liable to royalty claims.

Your question actually raises an important question in terms of copyright. If you use a compiler to produce a faster version of a Basic program, are you liable to have to pay royalties to the compiler supplier? In the world of commercial data processing, the answer is no.

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem Peek it to Phil Rogers and every week he will Poke back as many answers as he can. The address is Peek & Poke, PCW, 12-13 Little Newport Street, London WC2R 3LD

LAZY?!??

Let Comcon control your home for you via your computer.

Just plug your HiFi, TV set etc into the control unit (2 per unit to a maximum of eight), with the relevant interface and your computer will turn them on or off. A wide range of applications.

Suitable for Dragon 32, Spectrum or BBC (state which).

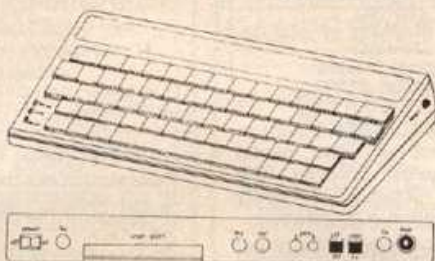
Control unit....£24.50

Interface....£21.50

Subject to availability

A&C Computers,
28 Rowan Way, Lisvane,
Cardiff CF4 5TD
Tel: 0222 756653/691494

NEED A REAL KEYBOARD For your Spectrum?



The Elder Systems professional series are simply the best keyboard around for professional use. Sleek and stylish with no ugly holes. All keyboards are individually made-to-order in our workshops and come fully fitted to your Spectrum with a full range of internally fitted options. Reset/Off, L.e.d. 305, Reset on/off L.e.d., monitor interface L75. Plus cassette interference interface, no need to remove leads 585. Prices ex V.A.T. Phone Eldersoft for full details: 01-478 1291 (10 a.m.-7 p.m.)

QUICKSHOT II for BBC Micro and Dragon



Plugs directly into computer
With rapid fire option

Dragon
£15.95
+£1 p&p

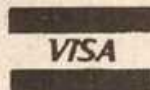
BBC
£16.95
+£1 p&p

Note: These are "switch" type joysticks. We have found these preferable to "analogue" type sticks for most games. However, a few programs will only work with the analogue type of stick.

Telford Electronics, 38 Mall 4
Telford Town Centre, Shropshire (0952 504911)
TF3 4DG



Access & Visa accepted



NOW AVAILABLE

THE QUILL

An adventure writing system for the Commodore 64

Cassette £14.95

Disc £19.95

....Also our superb range of adventures:

THE GOLD COLLECTION

For the Commodore 64

Cassette (only) £5.95 each

AFRICA GARDENS
MINDBENDER
DIAMOND TRAIL
DEVILS ISLAND
SPY PLANE
MAGIC CASTLE
BARSAK THE DWARF

Selected items available from good computer shops nationwide, including W.H. Smiths, or direct from us by post or telephone



(0446) 732765



GILSOFT

30 Hawthorne Road
Barry
South Glamorgan
(0446) 732765

✕ Cut out and send this ad to us
with SAE for further details

CLASSIFIED

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

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

UTILITIES



CRAZY HORSE SOFTWARE

PRESENTS

MAGNIFICENT SEVEN

DISC UTILITIES FOR CPC 464

• FAST BACKUP/RECOVER

• FAST FORMAT (15% FASTER)

• FILE COPY

• FILE/CLONE

• DISC TO TAPE

• TAPE TO DISC

• DISC TO TURBO TO DISC

£19.95

7 RAILWAY MEWS, LONDON W10

TRADE ENQUIRIES WELCOME

MICRODRIVE ONE (MD1)

WE OFFER ON ALL OUR PRODUCTS A FULL MONEY BACK GUARANTEE an update service, and FULLY detailed instructions with USER friendly programs. Match that!

YES AT LAST 48K Spectrum owners with m/drive can NOW transfer the MAJORITY of their cassette programs to m/drive (inc headerless, long programs, + those with LOW addresses — say 16384) and get them running.

OUR TCS program transfers the bytes + basic + arrays to m/drive at £5.50, but MD1 has 5 programs HELP YOU get them running + 2 "CAT" housekeeping programs. Includes program analysis, and other programs that produce the m/code you need. All our programs reviewed have received max 5 stars! (incl GRAPHICS toolkit £5.50). Introductory price £6.50 inc p.p. OVERSEAS customers: add £1 Eurolp. £2 others for each product. Send SAE for enquiries.

LERM, Dept WE1, 10 Brunswick Gdns, Corby, Northants.

THE TAPE DOCTOR for the Dragon. M/code utility to sort out problems on tape. Load damaged programs, merge Basic programs, etc. With comprehensive book. Only £4.99 from COMPUTIL (Dept PCW), 22 Grove Park, Burbage, Hinckley LE10 2BJ.

SOFTWARE FOR AMSTRAD CPC 464

VALUE FOR MONEY = CAMEL
The equation you'll grow to like!

The amazing GRASP graph and function plotter. Even better than the 5-star Spectrum version. Watch out for a great review in your official Amstrad User Club mag. Price £8.50 inc. p.p.
NUMBER 11. Previously economic simulation games have tended to be dull. Not this one! Great sound and graphics, battle for re-election with a chance for a coalition if you don't earn an overall majority, and grab a knighthood if you can. Outstanding value at £5.50 inc. p.p.
TOOLBOX. You'll never find better than this for utilities. Contains Graphics and Sprites creator (usable in your own programs), cassette backup utility with high-speed options, and a M/C monitor program. All for just £4.95.

Cheques/P.O.'s to:—
CAMEL MICROS, WELL PARK,
WILLEYS AVE., EXETER
Existing customers — note new address!

SOFTCELL'S DISCO

For the Commodore 64

This is the most powerful tape to disc transfer utility you can buy. No program rewriting is necessary! Why put up with second best? A must for all 1541 disc owners.

Only £9.95 and 50p p&p

Available from:

THE SIX-FOUR SUPPLIES CO
PO Box 19
Whitstable, Kent
CT5 1TJ

ACCESS/BARCLAY CARD ORDERS on:
(0227) 266289

Q.L. UTILITIES FILE UTILITY PROGRAM

Bidirectional scrolling directory with file length, copy complete cartridge, single key multiple copy and delete, full wildcard named copy and delete, print directory, print file block sector map, single key multiple format, verify file.

BOOT PROGRAM

Bidirectional scrolling directory with file length. Single key load or run.

£8.50 + 25p p&p for both
M. STRATHERN, 174 Richmond Rd
London E8

THEE JETSET WILLY EDITOR

100% machine code program. Will totally redesign Jetset Willy and create an extra 3 rooms.
£3.50 (inc. p&p).

Send cheques/P.O.s to:
SOFTTRICKS

1, Rowan Place,
Dundee,
Scotland DD30 PH.

Q.L. UTILITIES

4 programs on microdrive for Sinclair Q.L. to prevent D.I.Recovery overloading the screen, provide single key L.O.A.Ding or D.E.L.E.Tion of files, repeat F.O.R.M.A.T.ting of cartridges and back-up C.O.P.Y.ing of whole or part of a cartridge. £10 from:

W.D. SOFTWARE
Hilltop,
St. Mary,
Jersey,
Channel Islands
Tel: (0534) 81392.

M/CODE AID FOR BEGINNERS: (Spectrum 16/48K) includes hex loader, header reader and hex/dec converter. Only £2.99. Unit 2 Software, 43 Stanley Street, Ramsbottom, Lancashire.

SPECTRUM DIGITISER. Transfer any sized drawing to the screen. Digitiser software, overlay material and instructions, £9.95. CCS, 13 Walton Crescent, Llandudno Junction, Gwynedd.

ACCESSORIES

BLANK CASSETTES

10 C10's for £3.85; 100 for £25.00
10 C15's for £3.85; 100 for £26
10 C20's for £4.00; 100 for £27.00
FULLY GUARANTEED. Inc. P&P
C.O.D. add 50p. Immediate Dispatch.

U.K. HOME COMPUTERS

82, Churchward Ave, Swindon, Wilts.
24 HR Order Phone 0793-695034

BLANK DISKS SPECIAL OFFER

3 Ms, 5 1/4" single sided/double density

Supplied in boxes of 10.

Prices include V.A.T.

1-9 boxes £16.95

10-20 boxes £15.95

Please send cheques/P.O. to:

FREE FAST DELIVERY

S.J.B. Disk Supplies,

11 Oundle Drive,

Wollaton Park,

Nottingham NG8 1BN.

TOSHIBA HI-RES 14" COLOUR MONITORS

2nd user but excellent condition. TTL input, RGB sync. Nocrase, £119.50 inc. carriage paid.

309, INGS Road, Hull,
N. Humberside, HU8 0NP.

Tel: Lucas
(0482) 702999/701437

JOYSTICKS FOR QL

Plugs straight inot control port 1 or 2. NO INTERFACE REQUIRED. £7.99 each or 2 for £15.00. Add 50p p&p.
QL DISASSEMBLER £14.95 (inc. p&p).

COMPUTER SUPPLIES,
146, CHURCH Rd, BOSTON,
Lincs. PE21 0JX

Quickshot IIs £8.50

Microdrive cartridges £4.45
D.T. Decathlon (Spec) £5.75
Sherlock Holmes £10.50
Brother HR5 Printer £147.50
RAM Turbo I.F. £19.90
p & p FREE to Computec
135-137 Glasgow Road,
GLASGOW G6G 6TA
TEL: 041-7710074

GOOD QUALITY Blank C15 Computer
Cassettes Only £3.85 for ten. Send to:
Futura Software 63, Lady Lane, Chelmsford Essex, CM2 0TQ.

CLASSIFIED ADVERTISING RATES:

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

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

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

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

Here's my classified ad.

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

Please continue on a separate sheet of paper

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

Name

Address

Telephone

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

AMSTRAD, printer, cable, £12.99 inc. SAE for full list. Cheques/PO's to: Mistry Micro Services, 75 St. Margaret's Road, Bradford BD7 2BY.

BLANK CASSETTES

C10 £2.95 for 10, £23 for 100
C15 £3.05 for 10, £22 for 100 inc. p+p
FULLY GUARANTEED
Send cheque/PO to:
G.P.P.
369 Mile End Road
London E3 4QS
Tel: 01-980 1186

SERVICES

COMMODORE REPAIRS. By Commodore approved engineers. Vic 20 Modulators £6.50, Vic 20 from £14.50, CBM64 from £18.00, C2N from £7.00, printers, disc, etc. for more details write or tel: G. C. Bunce & Son, 36 Burlington Road, Burnham, Bucks. SL1-7BQ. Tel: (06286) 61696.

SPECTRUMS SERVICE AND REPAIRS

MAIL ORDER OR CALL IN
HUGE

selection of software and full range of accessories. SAE for lists.
Enfield Communications,
135, High Street,
Ponders End, Enfield, Middx.
TEL: 01-805 7434.

REPAIRS — ZX81 — SPECTRUM out-of-guarantee repairs by our computer dept. Engineers have had three years experience servicing Sinclair computer products. Price including p+p ZX81 — £11.50; 16k Ram — £9.95; Spectrum — £18.75. Send with cheque of P.O. to: TV service of Cambridge Ltd., French's Road, Cambridge CB4 3NP. Tel: (0223) 311371.

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, Edgware, Middx.
Tel: 01-951 0124

HEMEL COMPUTER CENTRE LTD.

For fast reliable repair service, send your 16/48K Spectrum computer to us.

We will repair and return for £18 + £1.60 p.p.
Also BBC, Commodore, Atari and Dragon service
Hemel Computer Centre Ltd.
52, High St,
Hemel Hempstead,
Herts.
HP1 3AF
Tel: 0442 212436

WHY DO SPECTRUM USERS FROM LONDON, DEVON, ESSEX, & CAMBRIDGE SEND THEIR MICRO'S TO US FOR REPAIR?

- Only Co. in all U.K. offering while-you-wait service.
- or 24 hour turnaround every micro insured for return journey.
- phone or send for free estimate enc. £1.00 UK, I.O.M., Eire, C.I.
- No hidden handling charges.
- special rates for schools.
- please phone for appt.



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

SPECTRUM REPAIRS £14 including parts, P&P etc. ZX81 £11. Fast reliable service (average repair 24 hours) by qualified engineers. — Tel: 0772 634897.

SPECTRUM REPAIRS

We expertly repair Spectrums for £15 inclusive of parts, labour and return postage. Spectrums upgraded to 48K for £24 including post.

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

SPORTING FORECASTS PROGRAMS by Professor Frank George for Commodore 64, BBC, Electron, Spectrum, Dragon, Football Forecast, Poolperm and Horse Forecast now available. Details from Poringware, PO Box 161, Brundall, Norwich.

MICRO SERU

The home computer repair specialist in Scotland

BBC, SPECTRUM, VIC 20 AND ALL PERIPHERALS. 3 MONTH WARRANTY ON ALL REPAIRS.

UNIT 4, Denny Workspace,
Denny, Scotland, FK6 6DW.
Tel: Denny (0324) 823468

GAMES SOFTWARE

WIN A QL!

Yes, you can be one of the fabled few to own the latest in home computing.

CELYN JONES SOFTWARE will give the first person to complete their adventure 'THE HOUSE' one of these amazing micros.

All you have to do is work your way through the house, and surrounding lands, find and translate the witch's will and the QL will be yours.

CAN YOU AFFORD NOT TO BUY IT?
(Clue:—No)

THE HOUSE — 100% machine code, over 100 locations all crammed into 40K.
THE HOUSE, 48K SPECTRUM. At the ridiculously low price of £4.00.

CELYN JONES SOFTWARE
14-16 Borthyn, Ruthin, Clwyd
YOU CAN'T WIN IF YOU DON'T BUY!

THE DUNGEON. The third in a series of text only journey's of myth and magic for the 48K SPECTRUM, £3.50 + 50p p.p. S.A.E. for list of other games. D. Newton 4 Pewfist Green Westthoughton Bolton BL52EP.

X-CERT

THE MUCH TALKED ABOUT X-CERT SOFTWARE

The sauciest game ever released for the 48K Spectrum, is available now, but only by mail order. Written entirely in machine code the game consists of 4 waves of SHOCK, HORROR and SCANDAL, featuring the ugliest to the most beautiful of girls, in which you have to..... CENSORED.....also you must..... CENSORED.....all the time. For your copy "Gissa Kiss" (code name, Smut) discreetly packaged, send £5.00 to Titan Programs Ltd., 46 Market Place, Chippenham, Wilts. SN15 3HU.

OVER 18's ONLY
... BUY NOW BEFORE
IT'S BANNED!

THE TRIAL OF ARNOLD BLACKWOOD AND SEQUEL; ARNOLD GOES TO SOMEWHERE ELSE AMSTRAD 64

THE TRIAL ALSO AVAILABLE FOR DRAGON 32 £5.50 EACH INC.
NEMESIS, 10 CARLOW RD., RINGSTEAD, KETTERING, NORTHANTS NN14 4DW

THE HAPPY HIPPY GAME FOR SPECTRUM 48K. The naughtiest game under the sun, better than page 3. The game with better gags than Hector Nicol. Send £2.50 to Class Games, P.O. Box no.7, ML66 BS, Lanarkshire, Scotland. ML66 BS

JETSET WILLY, hints + tips sheets, £1. Send S.A.E. + P.O./cheque to G. Carrott, 112 Granville Road, Gosforth, Newcastle upon Tyne, NE3 5LD.

HOLMES

Spectrum 48K..... £11.40
Full Throttle..... £5.70
Quo Vadis (C.64)..... £8.50
Midway (C.64)..... £8.25
Zaxxon (C.64)..... £8.50
Zim salabim (C.64)..... £8.50
Quickshot II..... £9.50

Cheques/POs to:

La Mer Software, 22 West St,
Weston-super-Mare, Avon BS23
1JU. Tel: 0934 26339



SETTLER. Calculates returns for any bet from one to six selections, win or each way. (Singles, doubles, trebles, yankees, super yankees, and heinz). For Unix Vic20, exp. Vic20, CBM64 or Amstrad CPC464, (please state). £4.00 inc. p+p from: DT Software, 53 Northumberland Crescent, Southend-on-Sea SS1 2XB.

SPECTRUM 48K "Empire Wars" two play strategy simulation of world war three. Played on Hi-Res map of Europe, £3.50 each incl. p+p to: L.M. Smith, 39 Brookside Avenue, Waterloo, Liverpool 22 3YD.

ADVENTURE PLAYERS

Find the Golden Mask and claim the prize. Over 100 locations.

RAMP SOFTWARE
For 48K Spectrum 19 Burn Lane
Tape £4 Newton Aycliffe
M/Drive £8.50 Co. Durham

PROJECT X THE MICRO MAN

TEXT ADVENTURE 48K ZX SPECTRUM
Trapped inside a 3 inch body, can you overcome truly mammoth tasks to reach your destination, the mighty COM-2 security computer.
100% M/C..... 150 locations
120 messages..... 80 graphic objects
all for just 3.25 (incl P+P)

COMPASS SOFTWARE (PCW 1)
63 Cozens Road, Norwich NR1 1JP

ARE YOU STILL STICKING PINS IN COUPONS? Our Spectrum 48K Pools Forecasting System is guaranteed better than chance — forecasts draws for all English and Scottish teams — updated for current season. Detailed owners manual. Only £6.95 inc. p.p. Cheque/P.O. to MISTRAL SOFTWARE, 241 Forest Road, Tunbridge Wells, Kent.

SOFTWARE

SMALL ADVERT BUT biggest discounts for biggest range software for most machines. SAE list (stage machine). Coastsoft 17, Pembroke Gardens, Holland-on-Sea, Essex.



**Book
your
Classified
or
Semi-display
advert by
Credit
Card**

**Call
Diane
Davis
on
01-437 4343**

BARCLAYCARD

VISA

up to 50% off!

write to:

CLUBSOFT
Unit 18, Wye Industrial Estate
London Rd. High Wycombe

ARE YOU STILL STICKING PINS IN COUPONS? — Our Spectrum 48K Pools Forecasting system is guaranteed better than chance — the forecasts draws for all English and Scottish teams. Updated for coming season. Detailed owners manual — launch price for limited period £5.95 (inc P&P). Cheque/P.O. to Mistral Software, Dept. PCW3, 241, Forest Road, Tunbridge Wells, Kent.

HORSE RACING ANALYSIS BY COMPUTER RATING METHODS

Why persist in backing losers when you could with the aid of your computer be backing winners instead. Answer in turn about 22 questions that will appear on your screen concerning each horse engaged in the selected race and BINGO the computer will present you with a very accurate RATING on the ability of each and every horse in turn. The answer to all questions can be found in the sporting papers. This unique method of RATING comes to you for both Fiat & NH on cassette for Spectrum 48K & Dragon 32 users only. Don't delay, write today enclosing a S.A.E. for further details to, C.R.M. 14, Langdale Place, Newton Aycliffe, Co. Durham, DL5 7DX.

DEAR ZX81 (16K) OWNER, if you're yet to win the POOLS, then you've probably been using the wrong pools forecast program. Most programs predict by team form. But team form will never win you the pools. We offer you POOLSTER, the only program that analyses the actual scored draw numbers and comes up with a sequence of numbers representative of most weeks. Cost £13.00. Order now from: Naigram Software, Soho Synthouse, 18A Soho Square, London W1V 5FB.

SOFTWARE BARGAINS

MASTERTRONIC GAMES

3 FOR £5.00

CBM 64 SPECTRUM VIC 20

88X Racers	(3D Maze)	(Alien Kill)
Duck Shoot	Bulls-eye	Bullet
Hektik	Electron	Duck Shoot
Orbitron	Gnasher	N.Y. Bitor
Space Walk	Spectrope	Scramble
Squirm	Tanktrax	Sub Hunt
Sub Hunt	Whodunnit	Undermine

price includes post & packing, & VAT
S.A.E. for lists. Tel. 0274 612702

Mail Order Software, 9 Knowle Lane,
Wyke, Bradford. BD12 9BE.

THIS SPACE FOR SALE

£18

TELEPHONE:

PCW CLASSIFIED

01-437 4343 Ext 206

BBC B-TAPE TO DISC ETC. Copier + character definer + a new plotter + a new character aid. Send cheque/P.O. for £5.00 to J & L Soft, 9 Downalons, Bushey Heath, Herts. For more info. send stamped addressed envelope.

UNIT TRUST INVESTORS 48K SPECTRUM PROGRAM

Review, update, analyse your holdings.
Printer and Microdrive options.
£12 inc. p&p SAE for details

Michael Slafford Software,
Dept. PCW, 3 Campden Road,
South Croydon, Surrey, CR2 7EQ

AUCTIONS

MICRO COMPUTER AUCTIONS

NEXT AUCTION — FRIDAY, 28th SEPTEMBER AT:
AUCTION ROOMS, 27, KING STREET, LONDON
WC2.

ENTRIES AS SOON AS POSSIBLE PLEASE;
CATALOGUES 50p EACH OR £3 P.A.
TO:

Micro Computer Auctions (PCWK)
Northington House
59 Grays Inn Road
London WC1X 8TL
Tel: 01-242 0012 (24 Hours)

EDUCATIONAL SOFTWARE

PLUS-ONE SOFTWARE

Programs that are enjoyable and Educational adventures and strategic for spectrum/ZX81.

SPECIAL OFFER

£5 plus free program of your choice

LUNAR BEACH

Supreme challenge on a voyage of exploration across a lunar landscape avoiding minefields and fighting off aliens in search of a distant spaceship!

Other programs cover Maths, English etc. Titles include: Pentominos, Story-time, Ordering.
SAE for catalogue to P.O.S. 35 Kendal Road West, Holcombe Brook, Nr. Bury, Lancs. BL9 9SV.

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.

DUPLICATION

HIGH-SPEED CASSETTE DUPLICATION

- * Full-colour laminated inlay cards
- * Cassette labels
- * Artwork
- * Blank cassettes

A comprehensive range of professional services at probably the lowest prices in the U.K.

High-speed loading of programs at up to 10 times the normal speed available for some computers at no extra charge.
Write or telephone for full details.

LOGICOPY

GOLDSTAR HOUSE

198/200 QUEENSWOOD DRIVE,
LEEDS LS6 3ND

Tel. for details: 0532 788758

jbs records

COMPUTER PROGRAMS

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

Dear Reader, my name is Simon Stable. I specialise in real-time data-duplication for most cassette based micros. Disc copying for BBC 40/80 (protection available) Dot-matrix printed labels/blank. Blank cassettes.
FAST TURNAROUND 0869 252831 COMPETITIVE PRICES
P.L. FREEPOST, 46 WESTEND, LAUNTON, OXON OX5 5JZ

DATA DUPLICATION M.G. COPIES

Burntwood, Walsall, West Midlands.
0543-480857 or 05436-75375 (24hrs)
Data duplication, quality cassettes, printing, distribution to customers with competitive prices and fast turn around.
Price lists and samples on request.

"DATATAPES" for highest quality blanks and data duplication, call now for a sample quote. You will find us VERY competitive. The Midland Railway Grain Warehouse, No 2, Derby St, Burton Upon Trent, Staffs. (0283) 38199.

COURSES

COMPUTER WORKSHOP

PRACTICAL COMPUTING
SERIES OF 1 DAY COURSES
Beginners; Business applications;
programming. £25 per day (lunch inc.)

Tel: 01-778 9080

COMPUTER COURSES

TAKE A MICRO-BREAK AND
COME TO BOURNEMOUTH

Mid week and weekend courses from beginners to advanced basic. M/C code and assembler courses available on request maximum 16 persons per course. Commodore 64's and BBC 'B's used or bring your own micro and we will adapt our courses to your machine.

for further info write to:
THE MICRO-LEARNING CENTRE
Saint John's Lodge Hotel,
10, Saint Swithin's Rd. South,
Bournemouth.
TEL: (0202) 290677

GLASGOW

Scotland's First Independent Micro
Training Centre
MICROTEACH

Complete Basic Programming
courses

BBC, SPECTRUM, DRAGON.
Practical 10 week course (eves) for beginners through to advanced graphics and small business applications.

TEL: 041 332 0666/9445.

QL SOFTWARE

QL SOFTWARE on microdrive includes: Basic, Chess, Orbiter Mars Lander, Eliza, Fruit Machine, Laserace, Mushroom Maze. Only £8.50 or £3.50 + Microdrive Rodent Software, 3, Brookend Drive, Henley, Warwickshire B95 5JA (PCW)

HARDWARE

I WOULD LIKE A BBC,
for a large Christmas pressy.
But there is one snag today,
I have no cash with which to pay!
I'll sell my Spectrum 48k machine,
By putting an ad in this magazine,
You can buy it if you like,
Just ring me from noon till night!
With it you'll get a microdrive,
ZX interface one.
Joystick, lightpen, sound board too,
And there is more to come!
One hundred pounds, cassette and books,
A printer and some paper,
Three blank microdrive cassettes,
Buy now, you'll not get it later!
Darrel Greenhill, only £375 o.n.o. Ring
Guildford 65644.

FOR HIRE

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

CLUBS

THE INTERNATIONAL ADVENTURE CLUB

For full Membership details and an application form, write to:

I.A.C. Membership Dept
10 Ennis Close
Harpندن HERTS AL5 1SS

Or Prestel Mailbox number: 582786663

INDEPENDENT AMSTRAD MICRO USERS CLUB

Newsletter, software
S.A.E. for details

John Noyce
PO Box 450,
Brighton, BN1 8GR
(Tel. 0273-602354)

BOOKS

BODY — POPPING, break dancing. All styles of disco. Teach yourself. SAE for details. Dance Publications, 136 Monkhill Lane, Pontefract WF8 1RT.

COMPUTER BOOK SPECIALISTS! Electron, Spectrum, etc. S.A.E. for lists. D.A. Armstrong, 30, Octavia Street, Kircalds, KY2 5HH, Fife Scotland.

FOR SALE

SPECTRUM 48K, boxed, with Scope 2, Softek compilers, white lightning, paint-box, sprite utilities and arcade games + mags + cassette recorder. Tel: Romford 60360 (evenings).

SPECTRUM 48K with Kempston joystick. W.H. Smith computer compatible recorder and sixty plus programmes in smart case, £180. Phone 09328 63955.

VIC20, 28K, disc drive, cassette unit, printer, afon 7-slot expansion console, joystick, user guides, programmers reference guide, Vic revealed, Basic parts 1 & 2. Get more from your Vic, word processor disc, Database (disc), Bank Manager (disc), Star Battle (cartridge), Jelly Monsters (cartridge), Alein (cartridge), Slot (cartridge), 'O' level physics, maths 1 & maths 2 (tapes), sound synthesiser (tape), various games and utilities (tape) + 2000 sheets of printout paper. Cost over £800, sell for £350 o.n.o. or might swap for good letter quality dot matrix printer with an RS232C interface. Tel: 0344 882344 evenings or weekends (Ascot).

COMMODORE 64 reset switch, complete built with listing, £3.00, just plug in, no more data loss, 224 Lower Road, London SE8 5DJ.

ORIC 1 16K, £50. Games, tape recorder & original box and books. Excellent condition, one year old. Tel: Ch. St. Giles 2966.

BBC 'B' Acorn joystick, manual and all leads, dustcover and extensive program library. V.g.c. £350. Tel: 0634 372616 (after 6pm).

BBC: Acorn joysticks £10, Shuttle, world travel game, Chieftain, Dodgem, Adventureland £4 each. J. Skinner, Winterclyde, Rogers Lane, Stoke Poges, Bucks.

C.B.M. 64 printer. Seikosha GP 100-VC, £135 o.n.o. 061-3308514.

CBM64 C2N cassette MPS801 painter complete leads, manuals plus Simons basic and manual some software. Bargain at £325. Will deliver to London. Tel: 0248 713012.

WANTED

AGENCY FOR THE COMPUTING ARTS
If you are a good programmer, you probably need an agent.
CALL:
BATH 60717
or write to:
6 Quarry Rock Gardens, Claverton Down Road, Bath, Avon BA2 6EF

PRIVATE FUNDS AVAILABLE FOR SOFTWARE DEVELOPMENT

Competent programmers are invited to apply for further information.

BOX NO. (PCW1) (CLASSIFIED)
Popular Computing Weekly,
12-13 Little Newport Street,
London WC2R 3LD.



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

AGENTS WANTED

To supply hardware/software to clubs, homes, schools, etc.
Up to 25% commission.
£20.00 worth of free software with your first accepted order.
Send for details to Home Base Micro Supplies: 4 Queenswood Avenue, Northampton.

WANTED: Top cash paid for home computers and accessories in good condition. Bring or mail (phone for quote). Computamart, 195 Seabourne Road, Southbourne, Bournemouth. Tel: (0202) 433759.

REQUIRED FOR UK and European distribution. We give the best deal for Spectrum, C64 and BBC games, educational and utility programs. Send tape to Datek, 11 Warwick Court, Princes Drive, HARROW, HA1 4UB. 01 861 1490.

CAN YOU PROGRAM? Freelance basic programmers, constant in graphics, required for interesting part-time work. Further information (anytime). TEL: 0223 62171.

WANTED

Second hand Spectrums and Commodore 64's
— 10% discount on all
48K Spectrums in July and August only.

NEWELL DATA SERVICES LTD.,
114, Fortress Rd.,
London NW5.
01-267 9037

BBC and ELECTRON PROGRAMS WANTED

I will give you royalties and initial payment for your marketable and original programs for BBC or ELECTRON.
I am particularly interested in marketing your educational, business or games programs.
Send your program or description for confidential evaluation or advice to—

WILLOW SOFTWARE
The Willows, Wington Lane, Congresbury,
BRISTOL BS19 5BQ

Computer Swap 01-437 4343

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

Acorns for sale

VIC 20 C2N cassette deck 16K expansion, four cartridges plus hundreds of pounds' worth of software, magazines etc. Bargain at £250 ono. Phone 01-977 7767 after 6pm.

"TOP SPECTRUM TITLES" (originals) for sale; 4 game package for £9.99 including 2 brand new releases. For more details phone 01-459 7652.

48K SPECTRUM Adventure featuring moving characters who think for themselves. £3.00 per cassette. Cheques/p.o. payable to J.M. Rawson, The Cottages, Groudie Glen, Onchan, Isle of Man.

BBC Software for sale or hobbit £7 moon raider, Moon base Alfa, Twin Kingdom Valley, flight simulator, £5.50p each. Tel: Rotherham 0709 864676.

ACORN DFS 0.90 kit £80 or nearest offer, 6116-LPs CMOS ram chips, brand new £3.15 each + postage, Rom board £15. Tel: 01-202 6410 after 6pm L. Vekaria

BBC & Joystick & 37 cassettes original ie Aviator, Frack, Frolness. All good condition. £260. Tel: 0702 546685.

ACORN ELECTRON for sale. Still under guarantee. Package includes software; cassette player; books & manuals; and all leads. Excellent condition at bargain at £175 o.n.o. Tel: (0532) 680435 (after 6pm)

BBC Model B £350 used for six weeks at holiday camp. Buyer collects NW7 01-959 3321.

BBC software for sale mysterious adventures £4 each, Snowball, philosophies quest £4 each, Arcadians arcade action, caveman jet power pack confrontation £3 each. Tel: Rugby 812940 (after 6pm) for details.

ACORN ELECTRON & tape lead & games tape. 4 months old. £170. Tel: (0327) 857422 between 4pm and 6pm.

ACORN ELECTRON & tape rec. & 2 ass. lang. prog. books. & s/w "Chudrie Egg" & every p.c.w. since 5/8/82 & other mags & back-up copies games, boxed w. manuals & leads. Sell £260.00 or £280.00 w. b/w portable. £710.00 p&p. Tel: Billingham 551049 (after 4pm Peter).

BBC 'B' tape recorder & s/w inc. Hobbit, & Zalaga. Still under g'tee. Worth over £500. £375 o.n.o. Tel: Exeter 75839.

BBC Model B 1.2OS, Graphics Rom, Joysticks, lots of games, etc. £350. 01-300 7384.

BBC Model B 1.2 os with B&W t.v. cassette recorder, Seikosha printer, speech synthesizer, Eprom programmer plenty of software and paper included. £650 or may split. Tel: Bicester (0869) 243563.

ACORN Atan, 8k & 12k ram, all leads & manual, over £40 s/w £55. Tel: 01-521 1058.

BBC B, 1.2 os, books & games (about 25 originals) dustcover, magazines, six month old, excellent condition, only £350 or swap for CBM64 with C2N and disc drive excellent condition only. Tel: (0924) 253261. Mark Bramley.

BBC Micro — lots of s/w (original) & tape deck. quick sale £300. Tel: 407 6647.

BBC & s/w & books, DFS fitted £400. 40-80 switchable disk drive for BBC & ask s/w. £150. Tel: Houghton-le-Sprey 849342.

BBC titles inc: Frack, Mr Wield, Fortness, Cylon Attade, Hunch Back & Mary Otten. (All originals) £4 each. Tel: 512 790 (Bristol)

ACORN ELECTRON Mint condition. Inc: £100 & s/w £160. Ted Flitwick 715898 After 6pm.

WANTED compute with disk and word processing s/w. Tel: 0253 256 79.

ACORN ELECTRON & interface & joystick & recorder & subs. & books & loads of software swap for BBCB 1.2os or best commodore 64 offer. Phone 021 742 1446 after 6pm ask for Nick.

BBCB software for sale including canyon, spiffire, killer gorilla, BD bomb alley. All original condition. Half shop prices or £15 the lot. For details ring Eddie on Telford 580614 anytime.

BBC 'B' DFS, ATPL Rumbard, £385 ono Acorn teletext adaptor, immaculate, £175 ono. Microwave double density DSF-kit £85 ono. Wordwise rom 1 manual (original) £25. Acorn Electron, excellent condition, £165 ono. Watford DSF-kit £85. Canterbury 750600.

BBC model B 1.2 o/s & view file, view calc. assorted s/w & joystick £230 ono. or £250 & spectrum 48. Tel: 01-527 3719.

SIDEWAYS Rom board for BBC £30 ono. Tel: (01) 603 9315.

Spectrums for sale

SPECTRUM 48K Kempston Joystick Fuller keyboard also software inc Scrabble Hobbit Valhalla etc. Also Micronet Interface. Offers! — Phone 041-357 1886 after 6 p.m.

ONE 48K SPECTRUM plus competition Pro Joystick and literature and software for only £75 — Telephone Ashted 77314.

48K SPECTRUM CASSETTE. Alphacom Printer. Kempston Joystick Quickshot. 80 tapes Business programming games, £225. Brother EP22 Typewriter/printer complete with RS232 interface. Tasword Masterfile, £150. — Phone laian Livingston (0506) 34497.

ZX SPECTRUM 48K, Profi keyboard, Data REcorder, Alphacom 32 printer, approx £650 software, can split printer and data recorder, £300 o.n.o. — 93 Norton Street, Grantham, Lincs.

48K SPECTRUM + printer + currah speech + Kempston Interface + cassette recorder and software. Swap for CBM 64 or sell for £220. — Tel Romford 69591.

48K SPECTRUM, Kempston Interface, Quickshot Joystick, tape recorder, computer case, Currah-n-Speech, 30 games originals. £200 or swap for other computer. — Tel Burth Heat 51121.

SPECTRUM 48K hardware and software for sale, with Amstrad colour includes speech, printer, light pen, etc. £250 or software. Selling cheap! (everything). — Tel. Paul (0582) 3731.

48K SPECTRUM with printer, printer paper, interface 2 with 2 joysticks, £250 worth of latest software and tape recorder worth over £600. Sell for only £350 — Phone 01-853 3247 after 5 p.m.

48K SPECTRUM approx £300 software + magazines, 1 years makers guarantee left, software includes quill, flight simulation, match point and scuba dive. Fully boxed the lot £160. — Tel: (0376) 43543 evenings.

300 SPECTRUM originals to sell — Phone Stuart on Bathgate (0506) 56478 or write to 92 Whitelaw Drive, Bathgate, West Lothian EH48 1RJ.

FULL THROTTLE for 48K Spectrum. Brand new £3.95 — Tel: (022 16) 4357.

48K SPECTRUM + WH Smith joystick interface 2. Boxed joystick interface. S/w worth £100 all originals. All under guarantee. £180. — Tel: 01-517 2795.

48K SPECTRUM ZX Currah micro speech, Kempston joystick interface, £450 of s/w, good condition, £125. — Tel: 01-556 9199.

48K SPECTRUM, lead an manual ZX printer 10 rolls of paper, Kempston

joystick with interface and general books, games and mags, inc The Hobbit, £150. - Tel: Merstham 5672 evenings.

48K SPECTRUM Joystick interface, B+W tv, £240 of s/w all originals (Jetset Willy) many mags (PCN, Which Micro) worth £470+, accept £250+. - Tel 12.30-4 p.m. Wed/Thursday 800-6397. J. Bell.

SPECTRUM s/w to sell, Fighter Pilot, Oracles Cave, £450, Bulls Eye £1.00, Learn to Read I £5.50. - Tel: Brain 5958840.

SPECTRUM SOFTWARE for sale. All originals, inc. Aquaplane, Terror Devil, Devils of the Deep (£4.50) 30 Tanx, Nitelite etc (£3) or swap any 8 for Currah Speech Unit. - Phone Pelsall 683375.

48K SPECTRUM Ser. 3, as new, boxed with manuals and leads. S/w including Jelpac, Vu Calc. Ferguson recorder sell for £120. - Tel 061-428 2209 after 6 p.m.

48K SPECTRUM GAMES for sale, 20 titles mostly Arcade style, but some adventures, £30 for lot or £2.50 each. - Nottingham 782299.

SPECTRUM S/W Fighter Pilot, £3. Picturesque Editor Assembler and monitor, both microdrive compatible, £8, Zip Compiler £2, Wanted Lynx s/w, - Contact Hugh, Glebe House, Royal Lane, Hillingdon, Middlesex.

SPECTRUM Currah Speech Unit plus Zon-X 3-channel sound generator in original boxes with manuals. Swap both for your ZX printer some condition. - Tel: 0532 658247 evenings (David).

48K SPECTRUM in mint condition with Valhalla, Tense French, Manic Miner, Jelpac, Tranzam, Inca Curse, Trans lower, Buggabo, Jet Set, StopSecret etc, worth £210 and still under guarantee, only £119 or swap for Commodore 64. - Tel: 01-837 3817.

48K SPECTRUM £200 of all original s/w i.e. Jet Set willy, TLL, Antics, light Ren, Joystick + Kempston lite all £160 o.n.o. - Tel: 01-443 0273 Paul.

SPECTRUM 48K, professional keyboard, printer, spare rolls, programmable joystick, interface, Quickshot s/w, mags, £180 - Tel: Capthorne 714721.

FOR SALE Spectrum software, Valhalla £8, White Lightning £8, both used only once. Advanced machine language book by Melbourne House, brand new £3.50. - phone Simon on (0742) 661671.

SPECTRUM SOFTWARE for sale, Vu-Calc, Vu-file and Biorhythms, all new and unopened, £2.50 incl. P&P each or all three for £6 inclusive. - Write to K.L. Chan, 9 Commarket, Thames, Oxon OX9 3DX.

SPECTRUM JET SET WILLY for sale. £2.50 - Tel: 0532 657038. Ask for Andy.

48K SPECTRUM, printer, Kempston Joystick, tape recorder, lots of software, mainly games + 2 books cost new £380, sell for £200. - Tel: 075782-278.

CURRAH SPEECH UNIT with tape £18, The Quill £8 for ZX Spectrum. - Tel: 01-809 1213.

48K SPECTRUM + printer + books and mags. Tapes and games, £140. - Tel: 0843 28480.

48K SPECTRUM + s/w + compatible cassette £95. - 05542 50810.

SPECTRUM 48K complete with printer, DK Light Pen, Currah Speech, Kempston Joystick and interface + over £100 worth of s/w inc. Jetman, Sasne Willy, originals only, worth £360. Sell for £220. - Tel 021-459 1921 evenings only.

SPECTRUM S/WARE + books for sale incl. all the best games and utilities for half price (originals only). - David 0236-29808.

SPECTRUM 48K software: Jakc and the Beanstalk, Theradactyle 4d, Snowmen, £16 the lot or £5.50 each. All the originals. - Tel: Jason on 01-524 0538 after 4 p.m.

48K SPECTRUM; Kempston Joystick and Printer interfaces; Viscount interface and Disc drive; Stack light rifle; much software £250 can demonstrate - 0530 36843.

SPECTRUM 48K in very good condition plus software including Hisoft Pascal and Devpac, plus books including complete Spectrum ROM disassembly, £110 o.n.o. - Tel: 0721 21340.

SPECTRUM SOFTWARE for sale all originals Hungry Horace, Road Racears, PacMan, Pool and Horace Goes Skiing, cost me £30, any one £3, two for £5. - Tel: Talsfield 9938 812.

SINCLAIR SPECTRUM 48K + all leads and manuals new in box plus interface 2 new + Planteoids cartridge and 20 other programmes incl. Valhalla Snowman JSW, £140 o.n.o. - 0582 866124.

COMPLETE SPECTRUM system for sale. 48k Issue Three computer, interface one, microdrive, two cartridges, ZX printer and paper, many programs including Pystron and Valhalla, £220. - Phone Thames 2873 (evenings).

48K SPECTRUM GC + tape recorder £100 of s/w Atric Attack, Magic Minor, £175 - 01-731 0360 after 6 p.m.

SPECTRUM S/W to sell: games incl. Mugsy, Valhalla, Trushman, Quicksilva Games designer + Mary Mole. - Tel: Oxford 66677.

SPECTRUM 48K boxed, excellent condition, £600 worth s/w mags £750, sell £225. - Tel: 0324 554551.

SPECTRUM 48K (four) new and boxed still guaranteed £125, four auto load units will load program from tape on power on £35. Ideal for exhibition displays. - Tel: 0772 633325 (evns).

SPECTRUM 48K carry case, programmable Joystick and interface, magazines, books plus over £90 or original software, £160 - Phone Epsom 29375.

48K ZX SPECTRUM printer, 15 rolls of paper, Currah speech unit, £50, original s/w, bks, £150 o.n.o. - Notts 6;2 384126.

48K SPECTRUM + £75 or original s/w. sound cones from TV, boxed, good condition. - Tel: 01-203 0846 after 7 p.m. Anmol Malhotra (Hendon area).

SPECTRUM 48K DK Tronics keyboard, ZX printer + 5 rolls of paper, programmable joystick interface, Quickshot II, some s/w, mags, £180 - Tel Copthorne 714721.

48K SPECTRUM guaranteed, cassette recorder, Kempston interface, point master joystick, mags, £100 of s/w (original) incl. Hobbit, Def Set Willy, £280, £185 o.n.o. - Tel: Bolton 27403.

SPECTRUM 48K plus 19 original games in good condition, games include Match Point and The Hulk, sell for £110 o.n.o. or swap for Atari 600LX - Tel: Wendover (0296) 62342.

SWAP Spectrum 48K, Joystick interface, recorder, software, dust cover, book (computer still under guarantee) for C.B.M. 64 (must be within guarantee) with or without extras. - Phone Douglas on 907 1204.

48K SPECTRUM + interface II + portable television, Joystick, Cartridges and stacks of tapes. Sell for £200 - Tel: 05827 69152.

SPECTRUM 48K, Quickshot Joystick + interface, tape recorder + 5 games, £125 - Tel: 0702 75784.

SPECTRUM 48K s/w originals for sale, as new £3 each. - Phone P. White, Epsom 21936 room 24.

16K SPECTRUM all manuals and leads issue one £50 o.n.o. 80k Add on for issue one, £20 o.n.o. - Hatfield (07072) 67455.

16K SPECTRUM for sale! A bargain at £60, hurry! and you get a free radio brand new! that can pick up all stations on earth! - Phone Conn (01-868 4124).

SPECTRUM SOFTWARE for sale. Tower of Evil, Redweed, Hobbit, McKensie, Lord of Time, Orc, Attack, Mad Martha I and II, P-Position, A-W Pet, Brad Blasts, Lazer Zone, etc. - Phone Steve (0703) 767580.

16K SPECTRUM + 32K fitted + Quickshot Joystick + Kempston interface + software, worth £200 total cost price £350, asking £200. - Contact Mr Reece, 55 Forest Road, Edmonton, London N9.

SPECTRUM adventure games for sale. Inca Curse, Castle, Magic Mountain, Pharaoh's Tomb, Orion, Oracles cave, Black Crystal, Volcanic Dungeon, all originals, £20. - Gray, 87th Tower Drive, Midton, Gourock, Inverclyde, Scotland.

SPECTRUM S/W for sale: Lords of Midnight, Black Crystal and Sword Fight, all in excellent condition, £15 or may split. All originals only. - Tel: Caerphilly (0222) 861235 after 6 p.m. Ask for Paul.

48K SPECTRUM, interface 1, 2 microdrives, 17 full cartridges, fuller orator, Currah Microspeech, plus cassettes. Worth over £500. Sell for £250 (upgrading) - Write to Derek Scott, 26D Harden Place, Hawick, Roxburghshire, Scotland.

48K SPECTRUM Fuller FDS keyboard, Fuller master unit, cassette, over £300 of software, books mags, sell for £250 or swap for Amstrad CPC 464 & colour monitor. - Tel: Fillongley (994) 41874.

ZX SPECTRUM hardware for sale. Includes Cambridge Joystick interface, Currah Speech. Original software also available. Abersoft Forth, New Generation MC Tutor. Offers to: D.J. Iannetta, 52 Finavaon Pl., Dundee DD4 9DY or Phone (0382) 43183.

UNUSED 48K SPECTRUM upgrade kit from Watford Electronics and other computer chips for sale. - Ring John 01-529 5402 after 6 p.m.

48K SPECTRUM or for swap electronic keyboard, joystick or joystick interface, £80 of original s/w. 6 months old or swap CBM 64 with tape deck. - Tel: Slough 44764.

48K SPECTRUM Interface 2. microline + 4 cartridges cassette recorder + 12 software tapes incl. Hobbit, Flag, etc. £235 o.n.o. - 0532 869425 MIR.

SPECTRUM S/W tosell from Ultimate, Sunshine, Sinclair, Silver Soft + magazines on tape. Also Spectrum manual + into to Booklet. 3 tapes given for complete ROM disassembly. - Tel: Jason 0685 841561.

48K SPECTRUM Microdrive interface 2, 4 cartridges, Alpha comp printer, Kempston Joystick, over £30 books, £200 s/w. All originals £300 o.n.o. - Tel: Hnedford 76368.

SPECTRUM SOFTWARE for sale, Les Flics £4, 3rd Vortex £4, Black Crystal £5, Love Quiz £3. All originals. Others available from Mr Keith Burton, 6 Westbourne Terrace, Bamsley, South Yorkshire.

SPECTRUM SOFTWARE for sale: Escape 3D Tunnel, Morris and Bikers, all £2 each or all three for £5. Moon Alert £3. All perfect condition and originals. - Phone 0763 61392 after 5 p.m.

COMPUTER SWAP

Computer Swap entries are limited to 30 words. Either fill in the accompanying form and send to Computer Swap, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD or telephone 01-437 4343.

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

It cannot be swapped.
Warning: It is illegal to advertise pirated software.

COMPUTER SWAP

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

Name.....

Address.....

Telephone.....

Dragons for sale

DRAGON 32 Cassette recorder, joystick, cartridge game + 10 cassettes including the king. Fully working. Also programmers reference guide worth over £200 sell for £100 phone (evenings) (0622) 45258.

DRAGON GAMES All original dragon trek £5 cosmic zap, Alcatraz II M&M, Cuthbert Jungle, Mines Eight Ball £4 or sell lot for £20. Tel Wideopen 364304 (David) after 6pm.

DRAGON 32 Tape recorder and book as new £95 Tel David 01-980 4888 Ext 252.

DRAGON 32,3 joystick Tape recorder, books an assembly language + Basic etc. Substantial S/W library, Assemblies + disassemble, mags, £100 of Arcade games (originals) G.C. Leads. £150. ono Tel: 04012 2157 e. Yorkshire.

DRAGON 32, joystick, 3 games one year old Hardley used. Tel: Southend 559511

DRAGON 32 Software, Pub crawl £4 and all because £4, T/and £4 mined out £3, chess cartridge £14, Physics tutor £3. If all bought for 32 You get free DRA/Book. Tel: 01-366 5944.

DRAGON Books, six assort inc. introduction to MC plus 60 progs for The Dragon, + books about learning to use the dragon cost £35 sell for £15 Halifax 249955 Paul.

DRAGON 32 + £300 of S/W (original) all boxed, excellent condition £175. Tel: Chandlers Ford - 60 745 eves.

FOR Quick Sale Dragon software and accessories at 33% original cost e.g. telewriter £16.50, joystick £5 Printer lead £5, Sanyo recorder £8 dasmindeon £10 Games cassettes £2.50 Tel. (0532) 672534

DRAGON 32 Software for sale all originals, all perfect, microdeals, morrisson PSS. etc. All half price 'ghost attack' carriage £6, Brentwood 211710 (Essex).

DRAGON 32, tape recorder, perfect working order. Tel: 021 502 0507.

DRAGON 32 BOXED, recorder, leads, manual joystick, £220 + of s/w (21) edit and DASM aldering + chess cartridge, pen, books, all DU mags to 84. £160 ono. 0895 441610.

DRAGON 32, CASSETTE recorder, games. Sell for £160. Tel: Hoddleston 442202.

DRAGON 32 — 8 months old. £155 of original s/w. 2 joysticks. Cassette recorder. Light pen books + Dragon User magazines. The lot £150 ono. Tel: 01-552 3276 after 6pm + w/e.

DRAGON software for sale. Franklins Tomb, Quest, Phantom, Pettigrews, Kriegspiel, Chuckie, Leggit, Frogger, Space Traders, Dragon Trek, all £4 each, or £35 the lot. P. Bonner, 20 Tamar Grove, Stafford ST17 9SL.

DRAGON 32 + over £150 of s/w. Joysticks (3), DASM Hi-Res, voice synthesiser cartridges, light pen, t/ recorder, dustcover, mags + books. Total value over £450. Sell for £180 only. Tel: Craig Wickford 65351 before someone else buys it after 6

DRAGON 32 Atari joystick & Dragon tamer, magazines, machine code book, dustcover, + software. Less than year old. £140. Tandy CGP-115 printer. £99. Together for £230. Both boxed Tel: 01-360 3443

DRAGON 32 complete with joysticks £150.00 worth of software £175.00 Tel: Norwich 419044

DRAGON 32, Sieksha printer, word-processor plus books and manuals plus £280 worth of software joystick and data recorder total worth around £850 offers around £290 Telephone: Bath (0225) 311774.

DRAGON DOS for sale £50 ono or swap for premier DOS or modem or anything Dragon related phone Peter at Antrim 65345

DRAGON 32 leads books joystick cassette recorder, mags, telewriter graph drawer decode personal finance etc no games £100 for quick sale Tel: Waltham Cross 29932.

DRAGON 32 with £150 software pair joysticks books complete set of Dragon user magazines all in mint condition £165 ono telephone 0942 876175 after 6pm.

DRAGON +3 joysticks, light pen, magazines, dust cover and software. Less than one year old. £150. Tandy CGP-115, colour, graphics printer + Dragon lead £95. Together £240. Tel: 01-360 3443.

Wanted

SPECTRUM SOFTWARE to sell or swap. Including Sabre Wulf, Orc Attack, Moon Alert, Mugsy, Night Gunner, Jet Set Willy, Orbiter, and ultimate games. Phone Geoff on Basingstoke (L0256) 53497 anytime.

SWAP MY CGLM5 computer with Basic 1 and Basic G, plus Datex recorder, for your Atari 400 48K preferred, with recorder exchange my Lazer 200 computer for Atari Roms. St Austell (0726) 63501.

SWAP PHILLIPS G7000 videopac games computer with five games good condition for 48K Spectrum no software needed or will sell £50 quid ono Tel: 7496053 ask for Dave.

SWAP ZX PRINTER for Fuller Master unit or Currah Micro Speech. Write to D Scott, 26D Harden Place, Hawick, Roxburghshire, Scotland TD9 7BY (8 rolls paper included).

SWAP 6 x 3 snooker table plus cues and pool balls for printer compatible with Vic 20, or offers ring Paul on S.O.S. 0702 540452.

WANTED ATARI 850 interface module. Good cash paid. Tel: 0664 61792.

DRAGON 32 joysticks £100 worth of s/w + books. Will swap for 48K Spectrum Cirencester 61787.

SWAP T199/4A for Spectrum or ZX81 CBM 64 + keyboard. Tel: 01 555 9571.

WANTED ZX81 RS 232 unit with cask preferably memotech £20 ono M. Rowland 22 Westbourne Park Villas, London W2 5EA.

WANTED fully expanded Acorn Atom circa £40. Will by software if available 0656 722 306.

WANTED Mulk, swap for sabre wulf or vahalla selling jetman doomsday castle, chuckie egg, T.L.L. Android 2 Classic, Adventure £2.75 other available phone Polegate 4336 (After 1 pm)

WANTED Atari 800 or similar will pay up to £80 Ring Honiton 41484.

SWAP ZX81 With 16K Ram-Pack, leads, software and instruction manual for colour portable TV or monitor phone Livingston (0506) 32657 after 4 pm.

SWAP Spectrum 48K issue 2 boxed plus RS 232 interface, original programmes plus possible cash adjustment, plus BBC B 1 2 O/S Tel: (0865) 777510 after 6.30 pm.

SWAP Two scale model cars for radio control in exchange for CBM 64 S/W or peripheral or even sell £25 each phone Keith Scunthorpe. 851132.

WANTED 48K Spectrum nothing else req'd also wanted Acorn electron software and penpal with electron in Birmingham age 13+ I am 16 phone 021-742-1446 after 6 p.m. ask for Nick please.

WANTED Somewhere in Ireland second hand or age or quickshot joystick plus interface would like

interface II can collect in some areas phone seamus (0502) 23503 after six. **WANTED** Model B BBC micro Tel 949/7464.

WANTED Soft switch cartridge for VIC20 pay up to £10 ring Hortley Spring - 84-6790.

48K SPECTRUM Tel 021 742 1440 (after 6 p.m.)

WANTED 48K Spectrum + electron S/W. Tel: 021 1446 after 6 p.m.

SWAP Acorn electron + cassette recorder + £100 S/W. All leads + terminals 300ks but lower for BBC model B or best CBM64 Tel: 021 742 1446 after six.

WANTED Spectrum 48K or CBM 64 with s/w for TI 99/4A or full colour dark room or both if with many extras. Cash adjustment if possible. Tel: Lymington 0590-78268.

WANTED Rabbit software games for Vic20 unexp./3K/8K/16K and Commodore 64. Send list to DAVE WOODWARD, 45, Stonerwood Ave., Hall Green, Birmingham, B28 0AX. No copies please.

WANTED Hell gate for the Commodore 64, £3 cash paid. Contact DAVE, 45, Stonerwood Ave., Hall Green, Birmingham, B28 0AX.

CBM OWNER seeks beginners to swap tips with. I have tape, disk drive & modem (CBM). 7 back issues of PCW & others. Tel: 01-748 8178.

WANTED 48K Spectrum. Must be under guarantee & with all leads. Will consider all offers. Phone Maldon (0621) 5945 (after 6pm).

WANTED ZX81 With memotech 64K RAM-PACK will pay £40 o.n.o. also ZX81 with Sinclair 16K wanted: phone 01-733 7188 anytime.

SWAP Cordless phone brande new boxed guaranteed cost £145 for Atari 1020 printed plotter in very good condition please write to Z. Pere 91 Highfield Ave. London NW.11

WANTED A-Bert for coleco. must be in v.g. condition will pay £15 to £17.50 write to W.L. tang 6, north Farm Road, Lancing, West Sussex, BN15 9BB.

WANTED 200 Channel CB Radio for electronic project. must be brand new and in full working order. send full details to T.P. Richards, 39 colman Walk Lockleaze Bristol BS7 9UG

'OMNIS' Apple Data base man system original software with light licence transfer £200 or swap apple CCs 7710 serial interface details 0491 874117. **Z80** Driven Data entry pad as new retails £689 only £250 or swap BBC Micro or other hardware, software details 0491 874117.

WANTED 48K Spectrum or BBC Tel: 0303 59897.

WANTED 48K Spectrum Tel: 021 742 1446 after 6pm.

WANTED: Complete collections of computing or electronic mags. Preferably recent home study courses. Phone Charles. Tel: 041 883 9264

WANTED: CBM 64 willing to pay up to £100 or £120 with C2N tape recorder. Tel: 741256 (Maldon)

SWAP Quickshot 2 with DK Tronics interface plus money and/ or software for alphacom 32 printer. Sell Nuway masterplug for £5 or include in SWAP. Phone Hon on 01-854 8561.

WANTED Thunderbirds fireball XL5 supercar stingray the Beatles etc anything models toys games Richard Joynton 110 Courtland Av Ilford Essex

WANTED: Full size keyboard for spectrum, must be good condition, in exchange for original software. Please write with details to, Mr G P Craig, 19 Finlow Terrace Fintry Dundee DD4 9NQ

TDS 84 is a telephone directory system for CBM 64 with a disk drive. Store upto 2000 names, phone numbers, and addresses. Fast search on phone number or name. Original program for only £20 Tareef al Altair - PO Box 1429, SAFAT Kuwait. 435892

WANTED: CBM 64 with cassette recorder will swap for 48k spectrum, interfaced stack light rifle, recorder and software plus mags and books. - Tel 0705 263 076 (after 6 pm)

WANTED: by unemployed electronic engineer any computer junk (ie boards, components, etc). Can pay postage, please help keep me sane! - Tel 0934 513492 ask for Richard

SWAP Sanyo sportster stereo dolbynr metal tape inc FM tuner pack ear-phones two speakers with built in amps for modem or speech module for Dragon. - Tel HX 247456

SWOP my aquarius computer system, 5 items, boxed and brand new, for 35mm photographic equipment, cameras, lenses, etc. - Phone Farnham 862456 evenings

SWAP 48k Spectrum, all leads, cassettes recorder, 8 original games, DKTronics, Interface Kempston convertible for Commodore 64 preferably with C2N. - Tel 0224 871957

WANTED Spectrum Penpal, to swap Hints, tips, and games. Interested? write to: Steve, 377, Winchester Road, Bassett, Sutton, SO1 7DJ, Hants or Phone (0703) 767580

SINCLAIR ZX81 16k Wanted £35. Selling 50 top Spectrum progs at 1/2 price eg forth £4.50 Hunter killer £4 phone or write 733484 145 Bryncyn Cardiff

WANTED Spectrum 48k. Will pay £60-70. Printer. Joystick, Microdrive. Write to E Van Derknaap. VUUNSE DREEF 75 - 3 73gks - Hollandsche Rading - Holland. - Tel 02157 1429

HELP! wanted - plans 1515 printer C won't supply - can you help. - Tel 01-840 3610

SELL OR SWAP BBC B Computer with extras for commodore 64 plus extras or commodore 64 plus money or £350 no offers. - Tel 051-263 3334 ask for Stuart

JUST PURCHASED Cumana Delta system disk drive for my Dragon 32. Any help or tips would be appreciated. - Tel Staines 58107 after 6 pm

FED UP with no software swap my Vic 20, 24k, C2N, cheapo printer, mother board, manuals and books for your QL. - Tel 01-986 2266 after 8 pm

WANTED: Amstrad software books, tapes etc. Ring Darlington (0325) 84357 or write to A A McCammon 11 Rivergarth, Darlington Co. Durham DL1 3SJ

32k VIC2 + C2N + Joystick, intro to Basic & books and mags. Swap 48k spectrum. Andy 01 841 0675 after 5 pm

SWAP Premier data, tape disc cassette (Original) for similar program for Dragon 32. - Tel Staines 58707 after 6 pm

10 Original tapes of spectrum s/h Inc: Atec Atac, Scuba dive. Exchange for 2X printer or other Spectrum accessories. - Tel 01-693 2961

WANTED Dot Matrix Printer using A4 paper compatible with 2+ spectrum £100. Age immaterial - Philip 0277 224320

SWAP or sell my Phillips Video recorder (New). £300 secures or exchange best computer offered tel 0793 641110. 9 am till 6 pm (Swindon)

WANTED Modem for CBM 64, Direct correct, any considered. - Ring 01-748 8178

WANTED BBC must be in good working order around £200. - Tel Dorking 881619

For sale

ORIC-1 48K plus MCP40 Printer 8 books £200 software including Xenon-1 forth hunchback Ultra H-attack all in very good condition and guaranteed only £170 ono Wendover (0296-624121)

FOR SALE ZX80 Boxed with all leads and power supply £15 o.n.o. phone Maldon (0621) 59452 after 6.00 p.m.

FRIDEN Felxwriter, electric typewriter, Printer and tape punch. Not ASC II Code but convertible heavy, boyer collects £10. Tel: 021-429 9171

BROTHER EP44 Thermal Printer/Typewriter, letter quality with RS232 interface unused £230 or swap for Epson or other matrix printer in V.good condition Tel 021 429 9171

TI-99 PLUS Extended basic, parsec tombstone city, cassette leads, TV basic o.n.o. Write 92a The Avenue, Ramsey Cambs. or phone Ramsey 813877 after 6 pm.

VISION'S Snooker for the Acron Electron for sale only £6.95 Tel: (0223) 832164

JETSET WILLY £3.50 Hunter Killer £5.50 Tel: Eardisley (05446) 202 After 7pm.

CRAZY CAVE MEN, Everest Ascent for sale Tel: 01 748 8178

LYNX 48K Boxed as new plus software including assembler, disassembler, extended basic, scrolling screen program and many mchine code and basic games £135 Tel: Stirling (0786) 841731.

ORIC MCP 40 unused and boxed £100 ono or swap for Dragon soft or hardware. Ring After 5.30, Stanley, County Durham 39431.

ORBIS Home Computer Course complete parts in Binders £18 o.n.o. after 7 p.m. 021 772 6891

ORIC 1 48K, leads, manual, P.S.U. cassettes. £50. Tel: 0895 832147.

BASIC MATTE Intellivision System Cartridges Best Offer, Tel: 0895 832147.

QL ATT-SERIES No dougie. £380, ono. 2 months old. Purelle interlace £40. 1 month old. Tel: Tony 578 7704 after 7pm.

ZX PRINTER 8 rolls of paper £34. 0302 722669. Nick.

SEKOISHA GP100A, Graphics Printer with Kempston Interface + paper for use with Spectrum £230. Tel: (0632) 581521 eves.

COLECOVISION + steering wheel + 5 games £100. Intellivision + voice + 10 games £100. Tel: 01-267 0055.

ALPHACOM 32 printer — 4 months old + 1 roll of paper. Spectrum Compatible will deliver within a reasonable radius. £43.00. Tel: Shrewsbury 59356.

ZX MICRODRIVE, Interface I, 5 cartridges + ZX printer. £100 ono. Tel: 01-874 4221.

SHARP MZ 80A 48k ensroll monitor + cassette, 34 utilities, 8 games, 6 tape starter pack, manual + books £350. ono. Tel: 0903 690370 eve + weekends.

14 IN COLOUR monitor Microvitech £150. Tel: 881-3501.

MACHINE LANGUAGE monitor cartridge (VIC-20) brand new — unwanted gift, best offer secures. Tel: 01-366 7115.

THREE BOOKS, under guarantee, Oric I, 5 s/w games, all leads, very good condition £100 ono. Tel: 4965 Cannock Beds.

SENSORY 9 chess computer. Cost £165 open to offers. Tel: 0302 49475.

ATARI soft, Donkey King, Robtron, Miss Pac Man, Pole position for CBM 64 will pay up to £13 each for originals. — Tel Wraybury 2518 after 7 pm

ADVENTURE HELPLINE

Hobbit on Commodore 64. How do you escape with the treasure from the dragon without being burnt to a crisp? George Macellaro, Dental Centre, Roberts BKs, Osnastrick, BFPO 36.

Voodoo Castle on Vic20. I have got so far as circling the coffin to wake up the Count, but I am unable to find the doll to finally complete the adventure. Any hints would be greatly appreciated. David Shpherdson, 3 Tarn Villas, Cowpasture Road, Ilkley, W Yorks.

Hobbit on Spectrum. How do you get across the dark river, get past the bulbous eyes and get down the trapdoor? Paul Milne, 52 Exeter Street, Gateshead, Tyne and Wear.

Hobbit on Spectrum. What is the right way in the dry cave as to get out of the goblins' dungeon I cannot get my Hobbit to go through the window? I Fitton, 290 Eastern Avenue, Dogsthorpe, Peterborough.

Knights Quest on Spectrum. I cannot get out of the deserted wasteland. I have with me a horse, compass, rope and book. A Blunnie, 24 Rockwood Avenue, Loughton, Essex.

Pharaohs Tomb on Spectrum. How do I get past the magic panel? Debbie Barbé, Vista du Guet, Coboroad, Castel, Guernsey, Channel Islands.

Madness and the Minotaur. I have got Vetar but I can't seem to be able to do anything else. S Power, 22 Church Close, Pool in Warfedale, nr Leeds, W Yorks LS21 1CN.

Voodoo Castle on Vic20. How do I get at the raven crying outside the window? Also, how do I get past the laboratory without being killed? Alexander Steeloe, 32 Jubilee Street, London E1.

Hobbit on Commodore 64. How do I stop getting caught after escaping from the goblin's dungeon? I have the ring. Anthony Green, 2 Edgfield Close, Whitchurch, Bristol 4.

Valhalla on Spectrum. Could someone please give me directions from Hellgate to Ofnir. Stephen Balmer, 'Crescent', Mill Road, Inver, Larne, Co Antrim, N Ireland.

Castle of Riddles on BBC. I cannot get out of the maze of jet-black passages. Have I simply gone the wrong way? Nigel Reed, 7 Crownfields, Langford Budville, nr Wellington, Somerset.

Hobbit on Spectrum. How do I get Thorin out of the goblin's mountain? I have the ring and I have got out myself. How do you cross Mirkwood? J E Foley, 156 Collier Row Road, Collier Row, Romford, Essex.

Velnor's Lair on Spectrum. How do I get past the sharks and enter the passage in the pool? R T Sanderson, 29 Feltree Close, Ford Estate, Birkenhead, Merseyside L43.

Alice-in-Wonderland on Memo-

tech. I am lost in Grimbley Forest. How do I get out? Alan Dobson, Flat 1, 200 Stockport Road, Timperley, Altrincham, Cheshire.

Pirate's Cove on Vic20. How do you get past the crocs in the caves on Pirates' Island? Anthony, 84 Wood Lodge Lane, West Wickham, Kent.

Hobbit on Spectrum. I am too thick to find the answers to the riddles and need advice for later on. Please help! Wayne Fletcher, 49 Airedale Road, Darton, Barnsley, S Yorks.

Hobbit on Commodore 64. How do I get out of the Elvenkings' Halls? And how do I reach the window in the goblins' dungeon? Martin D Wileman, 110 Lossiemouth Road, Bishopmill, Elgin, Grampian, Scotland.

Voodoo Castle on Vic20. How do you get through the crack into the wall? A Kingman, 6 Fallowfield, Leighton Buzzard, Beds.

Espionage Island on ZX-1. I can't get past the native woman on the grass plain, even with the lucky beads. I've had the game for four months and still can't solve it. Frazer Hay, 8 Grant Street, Culen, Banffshire, Scotland.

**SEE
INTERNATIONAL
ADVENTURE CLUB
(CLASSIFIED)**

Diary

Event	Dates	Venue	Admission	Organisers
ZX Fair	Oct 6 10.00am-8.00pm	Pudsey Civic Centre Pudsey W Yorks	75p adults 50p children	Northern Premier Exhibitions 0932 552654
Livingston Computer Fayre	Oct 6-7 10.00am-5.00pm	Peel House Ladywell Livingston W Lothian	£1.00 programme	Rec/W Lothian Computer club 0506 39048
Computer Graphics 84 (over 18s only)	Oct 9-10 10.00am-5.00pm Oct 11 10.00am-4.00pm	Wembley Conference Centre	Free in advance £5.00 on door	Online Conferences 01-888 4466
Appicot and Sirius Show North	Oct 16-18 10.00am-6.00pm	New Century Hall New Century House Corporation Street Manchester	Free in advance from organisers	16 Bit Computing Magazine 01-241 2354
Computer Games and Systems Retailer Show (trade only)	Oct 17-18 9.00am-5.30pm	Novotel London W6	Free	Macro Exhibitions 0992 469586
Home Computer Education and Games Fair	Oct 20 12.00pm-8.00pm Oct 21 10.00am-6.00pm	Luton College of Higher Education	£1.50 adults £1.00 children	Shaw and Kilburn 0582 29511
Electron and BBC Micro User Show	Oct 25-27 10.00am-5.00pm Oct 28 10.00am-4.00pm	Alexandra Palace London N22	£3.00 adults £2.00 children	Database Publications 061-456 8383
Home Tech 84	Oct 28-29 10.00am-6.00pm	Bristol Exhibition Centre	£1.50 adults £1.00 children	Nationwide Exhibitions 0272 650465
Computer in Action	Oct 30 10.00 am-6.00pm Oct 31 10.00am-8.00pm Nov 1 10.00am-6.00pm	Anderson Centre Glasgow		Trade Exhibitions 041-204 0280
Mycomp (Thames Valley Personal Computer Exhibition)	Nov 1-3 10.00am-6.00pm Nov 4 11.00am-5.00pm	Fulcrum Centre Slough	£2.00 adults £1.00 children	Swan House Special Events 06323 43866

Spectrum

- 1 (—) Daley Thompson's Decathlon (Ocean)
 - 2 (6) Lords of Midnight (Beyond)
 - 3 (1) Tornado Low Level (Vortex)
 - 4 (5) Jet Set Willy (Software Projects)
 - 5 (2) Fighter Pilot (Digital Integration)
 - 6 (4) Rapsallion (Bug Byte)
 - 7 (7) Match Point (Pison)
 - 8 (9) Sabre Wulf (Ultimate)
 - 9 (3) Cavelon (Ocean)
 - 10 (—) Full Throttle (Microomega)
- (Figures compiled by W H Smith and Son, London)

ZX81

- 1 (1) Alien Raid (CRL)
- 2 (4) Walk the Plank (Novus)
- 3 (3) Krazy Kong (PSS)
- 4 (—) Meteor Storm (DK'Tronics)
- 5 (2) Planet Raider (Novus)
- 6 (—) Meteoroids (DK'Tronics)
- 7 (—) Espionage Island (Artic)
- 8 (—) Krypton Ordeal (Novus)
- 9 (—) Flight Simulation (Pison)
- 10 (—) Black Crystal (Carnell)

BBC B

- 1 (1) Fortress (Pace)
 - 2 (4) Ghoul (Micro Power)
 - 3 (5) Smash and Grab (Superior)
 - 4 (6) Spitfire Command (Superior)
 - 5 (3) Micro Olympics (Database)
 - 6 (10) Mr Wiz (Superior)
 - 7 (8) Frenzy (Micro Power)
 - 8 (7) Aviator (Acornsoft)
 - 9 (2) Wallaby (Superior)
 - 10 (9) Stock Car (Micro Power)
- (Figures compiled by W H Smith and Son, London)

Dragon

- 1 (1) Up Periscope (Beyond)
- 2 (2) Ring of Darkness (Winterson)
- 3 (—) Cutthroat in the Mines (Microdeal)
- 4 (3) Chuckie Egg (A+F)
- 5 (—) Eightball (Microdeal)
- 6 (—) Mr Dig (Microdeal)
- 7 (9) Space Shuttle Simulator (Microdeal)
- 8 (—) Dungeon Raid (Microdeal)
- 9 (—) Buzzard Bait (Microdeal)
- 10 (6) Hungry Horace (Melbourne House)

Commodore 64

- 1 (1) Scramble (Leisure Genius)
- 2 (2) BMX Racers (Mastertronic)
- 3 (—) Beachhead (US Gold)
- 4 (8) Arabian Knights (Interceptor)
- 5 (5) Hunchback (Ocean)
- 6 (—) Decathlon (Ocean)
- 7 (4) Decathlon (Activision)
- 8 (—) Gulligan's Gold (Ocean)
- 9 (7) Space Walk (Mastertronic)
- 10 (10) Encounter (HiTech)

Vic20

- 1 (2) New York Blitz (Mastertronic)
- 2 (5) Snooker (Visions)
- 3 (—) Flight 015 (Craig Communications)
- 4 (10) Mower Mania (Voyager)
- 5 (7) Sub Hunt (Mastertronic)
- 6 (—) Tower of Evil (Thorn EMI)
- 7 (4) Phantom Attack (Mastertronic)
- 8 (6) Crazy Kong (Interceptor)
- 9 (—) Duck Shoot (Mastertronic)
- 10 (—) 3D Maze (Mastertronic)

Books

- 1 (5) Introducing Commodore 64 Machine-code (Granada)
- 2 (1) Commodore Programmers Reference Guide (Pitman)
- 3 (—) Guide to Playing the Hobbit (Melbourne House)
- 4 (2) Machine-code Sprites and Graphics on Spectrum (Sunshine)
- 5 (5) Practical Spectrum Machine-code (Shiva)
- 6 (8) Discover Your Spectrum (Century)
- 7 (—) Battle Games (Usborne)
- 8 (9) 100 Programs for the BBC Micro (Prentice-Hall)
- 9 (—) Space Games (Usborne)
- 10 (—) Computer Programming for Beginners (Fontana)

(Figures compiled by Websters/Bookwise)

BUMPER BOOK

Christmas comes but once a year and around now book companies try various ploys to get your money. One such ploy is the 'bumper' book containing a vast mish-mash of previous material from other books.

Obviously it involves no effort on the part of the publishers beyond commissioning a new cover so usually such books are relatively inexpensive. Provided you examine them carefully to check that you don't already have a lot of the material, these books can be a good idea.

The Complete Commodore 64 is one such book; it contains a large guide to programming in Basic, a lot of games to type in with notes and a large section on peripherals like disc drives and printers. There are appendices on hex/dec conversion, the 6502 instruction set and an, inevitably incomplete, list of software.

Book *The Complete Commodore 64*
Price £9.95
Micro Commodore 64
Supplier Granada Publishing
 8 Grafton Street
 London W1X 3LA

GOOD START

Step by Step Programming for the Commodore 64 is the first volume in a guide to the use of basic Commodore commands for calculation, sprite design, peek and poke, and so on.

There are numerous screen shots of what your TV should look like, which is more help than a dozen other ways of helping people understand the information.

In fact, even within volume 1 you are introduced to relative complex techniques, designing sprites screen maps and the like, so it's fairly rich in information.

If the fact that each part of this series is £5.95 doesn't put you off, then this is a pretty good start to Commodore programming.

Book *Step by Step Programming on the Commodore 64*
Price £5.95
Micro Commodore 64
Supplier Dorling Kindersley
 Goldstar
 1-2 Henrietta Street
 London WC2E 8PS

This Week

Program	Type	Micro	Price	Supplier
Star Avengers	Arc	Amstrad	£6.95	Kuma
Outpost	Arc	Atari	£12.95	Quicksilver
Jet Pac	Arc	BBC	£7.95	Ultimate
Lingo	Ed	BBC	£12.95	Cms
Know your Psi Q	Ut	BBC	£9.95	Mirrorsoft
Castle of Jasoom	Ad	Commodore 64	£14.95	Quicksilver
Ah Diddums	Arc	Commodore 64	£5.50	Beau Jolly
Ancipital	Arc	Commodore 64	£7.50	Llamasoft
Ant Attack	Arc	Commodore 64	£7.95	Quicksilver
Magic Micro Mission	Arc	Commodore 64	£7.95	Quicksilver
Poster Paster	Arc	Commodore 64	£6.95	Task Set
See Saw	Arc	Commodore 64	£7.95	Quicksilver
Snowman	Arc	Commodore 64	£7.95	Quicksilver
Strontium Dog	Arc	Commodore 64	£7.95	Quicksilver
Summer Games	Arc	Commodore 64	£14.95	Quicksilver
Attitude of Mind of				
Da Vinci	Ed	Commodore 64	£2.99	Weirdsoft
Master Mind	Ed	Commodore 64	£9.95	Mirrorsoft
Doddle	Ut	Commodore 64	£14.95	Quicksilver
Joffe Plan	Ut	Commodore 64	£9.95	Mirrorsoft
Know your own				
Personality	Ut	Commodore 64	£9.95	Mirrorsoft
Your Team	Ut	Commodore 64	£9.95	Marlborough
City Bombing Raid	Arc	Dragon	£2.00	Melior Software
Binary Land	Arc	MSX	£8.95	Kuma
Dog Fighter	Arc	MSX	£6.95	Kuma
Driller Tanks	Arc	MSX	£8.95	Kuma
Eric and the Floaters	Arc	MSX	£5.95	Kuma
Fire Rescue	Arc	MSX	£7.95	Kuma
Database	Ut	MSX	£19.95	Kuma
Home Budget	Ut	MSX	£14.95	Kuma
Wdpro	Ut	MSX	£29.95	Kuma

Out of the Shadows	Ad	Spectrum	£5.95	Mizar Computing
Strontium Dog	Ad	Spectrum	£6.95	Quicksilver
The Final Mission	Ad	Spectrum	£5.50	Incentive
Battlezone	Arc	Spectrum	£6.95	Quicksilver
Blood and Guts	Arc	Spectrum	£6.95	Quicksilver
Dishes	Arc	Spectrum	£5.95	Cataclisma
Psytraxx	Arc	Spectrum	£6.95	The Edge
Starbike	Arc	Spectrum	£6.95	The Edge
The Journey	Arc	Spectrum	£7.95	Temptation
Zombie Zombie	Arc	Spectrum	£6.95	Quicksilver
Star Seeker	Ed	Spectrum	£9.95	Mirrorsoft
Eric Bristow's Pro Darts	S	Spectrum	£6.95	Quicksilver
Joffe Plan	Ut	Spectrum	£9.95	Mirrorsoft
Know your own				
Personality	Ut	Spectrum	£9.95	Mirrorsoft
Master Mind	Ut	Spectrum	£9.95	Mirrorsoft
Your Team	Ut	Spectrum	£9.95	Marlborough
Megavault	Arc	Vic20	£5.50	Beau Jolly

Key: Ad — adventure/Arc — arcade/Ed — education/
 S — strategy-simulation/Ut — utility

This Week is a new section that covers all the new software coming on to the home micro market each week. All suppliers should send details of their new programs to: This Week, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

GOLDEN IDOL

Next up for the Commodore from Beyond is *Aztec*, a joystick and keyboard controlled adventure apparently based on Indiana Jones' crowd pulling exploits. As a game it isn't quite like anything else, but reminds me vaguely of *Oracles Cave* on the Spectrum. You control a Jones-like figure (complete with safari suit and cap) and move him around a maze of levels and ladders.

The idea of the game is to find a missing golden idol, hidden somewhere in the maze. The figure can run, jump, crawl, set dynamite, fight, open boxes, etc. There are a variety of nasty things lurking in the depths of the cages including spiders, snakes, dinosaurs and beautifully animated Zulu type warriors.

Although the skills you need to play the game are arcade orientated — fast reactions playing the major part — but there are others, like remembering the levels that end in a void and noticing trapdoors. Certainly the number of events within the game lift it well above the usual level.

Some of the graphics in *Aztec* are astonishing — watch out for the man-eating plant and the tiger — although the actual levels and ladders are very simple, suprisingly so given the complexity elsewhere.

Program *Aztec*
Price £8.95
Micro Commodore 64
Supplier Beyond
Durrent House
8 Herbal Hill
London EC1R 5EJ

INDEPENDENT

Twin Kingdom Valley was one of the very few graphically illustrated adventures that did not originate on the Spectrum — more than that it was not even made available on the machine. Until now.

Bug-Byte describe the Spectrum version as 'the greatest achievement in the history of home computing'. Hmumum. Well, anyway the program has more pictures than the

Commodore 64 version with as much, if not more, detail.

As an adventure *Twin Kingdom* had good, if not ecstatic, reviews. It doesn't understand very complex sentences, but let's you know quite clearly what words it does and does not know, typing help actually lists them out for you.

The graphics are thoughtfully designed with a large, vaguely cartoon-like quality. There are other characters in the adventure who exhibit a certain independence or randomness depending upon your degree of cynicism.

There are 180 different locations in the adventure illustrated with 150 different graphics — in the limited time for wandering about, I discovered enough to get me pretty hooked. But why can't I find flint in a disused flint quarry?

Program *Twin Kingdom Valley*
Price £7.95
Micro Spectrum
Supplier Bug-Byte
1 Stanley Street
Liverpool L16AD

ALIEN ATTACK

Despite the failure of the Dragon machine there are still independent software houses supporting it with quite reasonable software.

Death Valley has the kind of smooth sprite graphics that only seem to have appeared



fairly recently on the Dragon. In this case you get a rather neat alien landscape with spinning planets and puffing volcanoes and — almost inevitably — the Dragon's unenviable yukky green background.

Pick of the week

ILLEGAL GOODIES

Acornsoft have, quite honestly, been responsible for some of the dullest computer programs I've ever seen.

Until recently their top sellers were tedious versions of *Meteors* and *Invaders*.

Things may be looking up, though, with *Elite*, a program good enough to raise at least half an eyebrow from a Spectrum owner. For one thing it's quite astonishingly complicated — not only do you get a program but also a 65-page manual, a control summary card (there are a lot) and a 50-page scene setting manual.

The plot involves your zooming through the heavens trading in various goods, fighting off baddies and maybe occasionally taking a chance with some illegal goodies (watch out for the customs though). Using black-on-white line graphics has meant that enough memory is available for a tremendous number of different facilities — there are dozens of different controls for navigation, various charts, combat flight, etc.

The graphics are superb and are animated in 3D in a similar way to *Battlezone* — you can fly around a static spaceship in all dimensions and it's very impressive.

Playing the game involves a quite incredible number of dif-

ferent considerations, each of the ships you may meet in space has different performance characteristics and is equipped with different weapons.

Different planets have



different political systems that may be more or less favourable to you; highly entrepreneurial, trade orientated and so on.

Elite is by far the most impressive game Acornsoft have ever produced and, in terms of complexity, may be the best game ever for the BBC.

Warp factor five, Scotty.

Program *Elite*
Price £14.95
Micro BBC
Supplier Acornsoft
Betjeman House
104 Hills Road
Cambridge CB2 1LQ

DESPERATE

Slowly, perhaps more so than with any other machine, independent software is emerging for the QL. Despite the sophisticated features of the machine, the first programs to be released are following a weary and familiar path.

Quantum Soft is a small independent company that has issued two games at £9.95 each, *Hangman* and *Mastercode*, which turns out to be *Mastermind*. Both games are available on one microdrive for £14.00.

The game looks good but since it consists almost entirely of blasting aliens it can't be said to hold the attention overmuch.

In my first attempt at the game I survived about five alien attack waves.

Still, I never did like alien blasting and it does look nice. And it looks green.

Program *Death Valley*
Price £6.80
Micro Dragon
Supplier Micro Data
Unit A4
39 Sheridan Road
Frimley
Surrey
GU16 7DU

Hangman lets you choose from a number of different databases for the words. Standard graphics are used to create an OKish man whose fate is in the hands of your vocabulary.

The program plays *Hangman* well enough and has clearly had some effort spent on it but it is intrinsically unoriginal. It doesn't even match up to even the humblest Spectrum game. On the other hand, QL owners must be desperate for some software and I have seen bigger rip-offs in the early days of a new machine. Worth it if you're desperate.

Program *Hangman*
Price £9.95
Micro QL
Supplier Quantum Soft
Marloes
Borrowby
Thirsk
North Yorkshire

HAMPSTEAD MAN

Hampstead is a machine-code text adventure being released by Melbourne House at the same time as *Sherlock Holmes* — although it is radically different in scope and intention.

Aside from the plot, the really odd thing about *Hampstead* is that it is written almost totally with *The Quill*. Which only goes to prove once again that if you want to write text adventures then *The Quill* is the program for you.

Hampstead is, technically, an unsophisticated adventure — nearly all the commands are simple Verb/Noun combinations but then that's hardly the point. The real point of *Hampstead* is that it is *funny* and the

humour is genuine unlike some of the witless stuff which usually populates computer games.

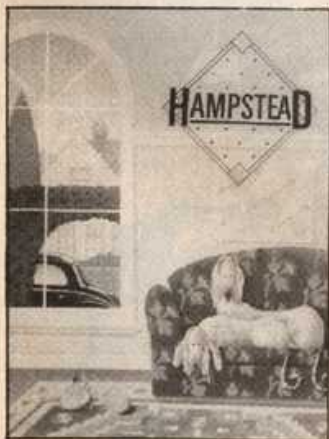
The idea is not so much to find *Hampstead* but to attain *Hampstead* — to live and breathe its very soul (Meunière). You must rise up from your disgusting dole ridden origins, learn the correct codes and manners and, instead, become the kind of person who writes books looking sociologically and sympathetically at the plight of the unemployed.

Read the right books, wear the right clothes and marry into wealth. As an adventure it's moderately difficult but has obviously been designed with people who don't usually play adventure games in mind.

In fact, playing *Hampstead* is almost certainly going to become a pretty *Hampstead*-type thing to do. It has already been featured in one Sunday colour supplement and will almost certainly be featured in others.

I hope Gilsoft are being given something other than the mention that they ask for using *The Quill* on this one.

Program *Hampstead*
Price £9.95
Micro Spectrum
Supplier Melbourne House
Castle Yard House
Castle Yard
Richmond
TW10 6TF



TIME ZONE

Kokotoni Wilf you will have seen advertised a lot recently as a sort of super *Jet Set Willy*.

In fact it is only like *Jet Set* in the same way that lots of programs are — you dodge things, manoeuvre carefully and collect other things.

Other than that it is actually quite original. The idea is to collect the various pieces of the dragon amulet scattered throughout time — the hero is Kokotoni Wilf (I suppose Wilf beats Tharg as a name, hardly the stuff of heroes I'd have thought, though.)

There are 60 screens divided into six different time zones populated with the appropriate scene. The first age in the game has been made relatively easy so that you can get used to the way it works,



but even so I only managed about five out of ten screens.

The graphics are nice and mostly pretty detailed although Kokotoni himself is a bit small. Having different time zones makes for sharply contrasting screens and a good time should be had by all if you like this sort of game.

A Commodore version is also available.

Program *Kokotoni Wilf*
Price £5.95
Micro Spectrum
Supplier Elite
55 Bradford Street
Walsall
W. Midlands

COMING SOON

Christmas is rapidly shaping up into a positive bonanza of exciting programs for the Spectrum.

After *Deus Ex Machina* and *Avalon*, we now have a pre-release glimpse of *Tir Na Nog* from Gargoyle Games.

This animated graphics adventure, due to be released in mid-October, looks as though it ought to sell awesomely. In some respects it is the closest thing yet to an interactive movie.

Tir Na Nog is loosely based on some authentic Celtic myths and concerns the adventures of the hero Cuchulainn as he tries to reassemble the fragments of the Seal of Calum.

The central character is represented by a beautifully animated (64 different frames) figures — 56 pixels high — who lollups determinedly across the screen under your control

(complete with hair waving in the wind).

The figure walks, protects himself with any useful sword or stick he might have found, picks up and drops things and searches the world for clues to his quest. The entire vast landscape can be viewed from any compass direction with a special key being used to change the 'camera' viewpoint.

There are barrows, harps, volcanoes, a distant castle, doors locked and unlocked, and a variety of other creatures — most of them dangerous, with whom you will have to deal or fight. One group are the Sidhe, strange monkey-like creatures which look less harmless than they are. Other characters may be persuaded by one means or another to divulge important information or even give you parts of the Seal of Calum.

Finding your way around, working out what to do and how to treat the other creatures you meet requires a mixture of lateral and logical thought, fighting skill and, maybe, your local library where more information on the myth can be found.

Since obtaining some parts of the Seal depends on completing a number of sub-plots, Gargoyle are humorously speculating that this may be the first adventure that may take years to play and complete.

The plot has everything an adventurer could want and the graphics are amazing — the simple expedient of making the part of the screen, ie, the bottom section, all one colour has meant that there is no colour-res problem and consequently not a trace of flicker.

If you have to buy one game at Christmas for your Spectrum this, so far (September) could well get my vote.

I'm looking forward to the finished game with great anticipation.

Compiled by Graham Taylor

New Releases is designed to let people know what software is coming on the market. If you have a new game or utility which you are about to release send a copy and accompanying details to: New Releases, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.



Write on, Rom

Have you ever noticed how human nature makes us want to leave our mark on the world?

I'm not talking of ambition or the altruistic ideals of leaving the world a better place, I mean the desire to scratch your name on the rocks by Niagara Falls.

It comes to nearly all of us from time to time. We somehow want to communicate with unknown people who visit the same place at a future date.

The most famous example of this is the "Kilroy Was Here" messages said to be left all over the world by American servicemen during World War II. Various explanations have been proposed for this particular fashion, including espionage activity, markers left by the catering corps, and adolescent hysteria. I think that whoever was actually leaving their mark in this way was really combining two impulses. They were 'joining the club' by all writing the same name and they were satisfying that need to communicate with peoples, unknown when in strange places.

The men and women who produce computers are people just the same and are often afflicted with this same desire to leave their mark. Where better to leave their mark than in the systems they are producing. Usually such signatures are well hidden, the point is for such marks only to be found by a small number of people who are probably

looking for just such a mark.

As a simple and well known example, have a look at the end of the Basic Rom in a BBC micro (using the monitor I mean, don't take the machine to bits). Right at the end the message "roger" appears, left there by Roger Wilson the software author.

Acorn is not the only manufacturer to give its workers a chance to leave their names in Rom. The Computers Lynx Rom starts off with the names Davis and Susy. Davis is Davis Jansons one of the Rom's authors — I don't know who Susy may be, perhaps another software writer, or a friend.

Even Sinclair does not seem to be totally immune to the graffiti game, although I have never found or heard reference to any names left in the Rom. Those mysterious letters used to indicate different versions of QL Rom, such as FB and AH, are the initials of various engineers working for Sinclair Research. JM for example stands for John Mathieson. I cannot say which ones are about to be given pay rises and which ones have now moved to the opposition. Perhaps the final version of the QL will be called CS.

Perhaps the most interesting case to come my way recently is that of a pre-production computer which has been recently announced in the UK (I cannot name it directly) which contains the names FRED B., TERRY RT., and MIKE I. at 48160 (BC20h). Perhaps these names will be erased in the production version. No other names appear this explicitly in the Rom but I came across something of interest whilst hunting for something else. On entering "SYS 52680" some additional names are printed to screen, these being F. BOWEN, J. COOPER, B. HERD, and T. RYAN.

Now these may be legitimate employees of the microcomputer manufacturer, but I have a sneaking suspicion that they actually represent the software house, a completely different organisation. Their names were well hidden and this may reflect the mistrust of the manufacturer by the software writers.

What next in the Rom graffiti world? I have yet to find a sentence or anything other than initials and names.

If anyone else has found any interesting things in their Rom why not drop me a line?

John Cochrane

Nine, nine, nine

Puzzle No 126

I asked Tom to think of a digit (not zero) and write it down three times in a row. I then asked Dick to think of a different digit and to write this three times alongside Tom's three digits. Finally, Jane was to choose a third digit, different from the other two, and write it down three times at the end of the row so forming a nine-digit number.

er o o n e t w o t h r e e f o u r f i
e r o o n e t w o t h r e e f o u r f i
e r o o n e t w o t h r e e f o u r f i
e r o o n e t w o t h r e e f o u r f i
e r o o n e t w o t h r e e f o u r f i
e r o o n e t w o t h r e e f o u r f i

For instance, if they had thought of one, two, and three respectively the number written down would have been 111222333. However, the number that was formed proved to be just one less than a perfect square.

What was the number?

Solution to Puzzle No 121

There were 17576 blocks cut from an original cube 26 units along each side. A square pyramid of 37 tiers in height would use just 17575 of the blocks.

The program calculates the number of individual blocks in square pyramids of ascending size. It then checks to see if this number (plus one) is equal to a cubic number.

```
10 T = 0:20 N = 1:30 T = T + N:40 X = (T + 1) / (1/3):50 X = VAL (STR$(X)):60 IF X = INT(X) THEN PRINT N:T,X:70 N = N + 1:80 GOTO 30
```

Winner of Puzzle No 121

The winner is M J Fecher, Hungerford Drive, Maidenhead, Berks, who receives £10.

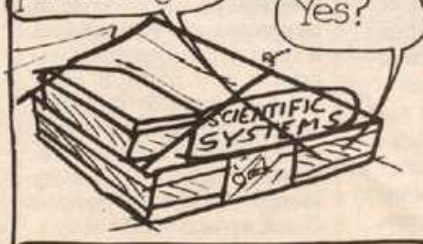
Rules

The closing date for entries to Puzzle No 126 is October 6. If the puzzle can be sensibly solved using a computer, then the winner will have included a listing of the program used to find the correct answer.

The Hackers

About that floating-point parallel-processing board you sold me for real-time signal processing.

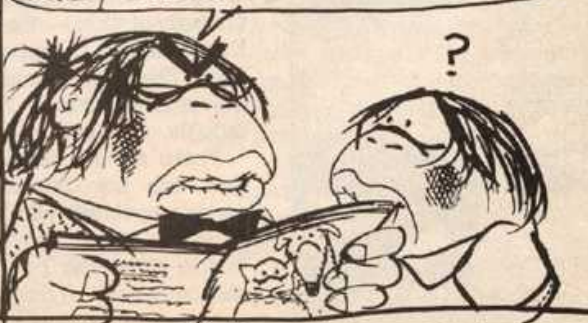
Yes?



The handbook is incomprehensible. Here on page one for example...



Where Derek dog is explaining to Cathy cat about decimals...



You'll never dream a program
could be this good!!!



PYJAMARAMA

Join Wally in his nightmare

Sensational Software from

MIKRO-GEN

44 The Broadway, Bracknell. Tel: (0344) 427317

Available for Commodore 64 and Spectrum 48K

ADVERTISEMENT

"DEUS EX MACHINA" is intended as a totally original audio-visual entertainment, in which the "player" actively takes part in a televised fantasy, fully synchronised to a stereo soundtrack. Enjoy it.

©AUTOMATA U.K. LTD. 1984
27 Highland Road, Portsmouth, Hants PO4 9DA, England.
©All rights reserved.

Creeping, crawling, occasionally floating,
Encased in a tank, not speaking.
Growing a little, hour after hour,
Keeping his interest, occasionally,
With a hint of my wondrous power.

No problem. It's easy surrounded by friends,
Like the Ventilation system... (hello)
The Security Net... (Hi there you guys)
Oh yes, and not forgetting The Machine...



THE DEFECT POLICE

Follow the secrets
Touching the right.
Escape little Defect, into the night.
Wires in your fingers
And wires in your toes
Wires in your head
Wherever you go.

Escape with my blessing.
Escape with my curse.
Learning your secrets will fatten my purse
When I have put the world in my pocket
I'll tear out your plug
And burn out your socket.

War crimes are easy.
The uniform's free.
Follow the drumbeat.
Don't follow me.
Jump without question
Into the fire.
War crimes are easy.
This gun's for hire.
War crimes are easy.
When I say 'jump', jump.
Wait for it, wait for it... Jump!

Don't it ever get weary
Don't you ever want to Exit and Die?
At the end of our Program
A sore with a bare head
And a pair of hot, blind eyes.

You can move mountains.
You can read minds, you make the Laws.
The cloud-capped towers,
The gorgeous palaces are yours.
You raised the stakes and burned them,
You're an ass soul,
I wish I'd never made you.

You stalk the Overlevels.
You take them in your stride.
You pompous human devil.
You data bank is fried...

THE FERTILISER

Imagine. Imagine if we could begin our little life all over again.
Imagine if it was all nothing more than some Electronic game.
Imagine if I knew then what I know now.

CRUSOE	48K Spec £6	DEUS EX MACHINA	48K Spec £15	PIMANIA	48K Spec £10
PI-EYED	48K Spec £6	GO TO JAIL	48K Spec £6	OLYMPIANIA	48K Spec £6
PIROMANIA	48K Spec £6			PI-BALLED	48K Spec £6
PI-IN'ERE	48K Spec £6	MORRIS MEETS THE BIKERS ..	Any Spec £6	DARTZ	48K Spec £5
YAKZEE ..	Dragon/48K Spec £5	T-SHIRTS State Size	Price £5		
'BACKCHAT' Speech Synth. CBM64 with Software & Programming Book			£25	Piman's Stereo L.P. Cassette	£3
PIMANIACS CLUB for 20% off all products, PI-Monthly Magazine. Annual Subscription U.K. £5				Overseas	£7

I enclose the right money, or debit my ACCESS/VISA Card. My Card number is

Card holders signature Card holders name My name

My address

Post Code

NO EXTRAS! All our prices include VAT and Postage & Package. 24 hr. - CREDIT CARD HOT LINE (0705) 735242.

Send your order and payment to: AUTOMATA U.K. LTD. 27 HIGHLAND ROAD, PORTSMOUTH, HANTS. PO4 9DA, ENGLAND.