

POPULAR Computing WEEKLY

Only 40p.

22-28 November 1984

It's the best selling weekly

Vol 3 No 47

Desk-bound

ICL has now launched its QL technology-based One Per Desk executive workstation.

The machine — the first device to incorporate a computer and intelligent telephone terminal in one package — is available in a number of configurations with the base model costing £1195.

One Per Desk (OPD) has been developed from a modified QL and has 128K Ram, 68008 processor, ICL variant of Sinclair SuperBasic, and twin Sinclair Microdrives. It is supplied with either a monochrome or colour monitor. Psion's *Xchange* suite of software is also available as an option (£150) on a plug-in Rom cartridge.

OPD includes a built-in telephone with conventional handset and software auto-dial directory, capable of storing up to 500 names and numbers. An integrated, switchable baudrate (300, 600, 1200 or 1200/75) modem provides — with a built-in database directory — single-key access to networks such as Prestel, BT Gold and PSS, as well as Telex facilities.

An auto-answer capabi-

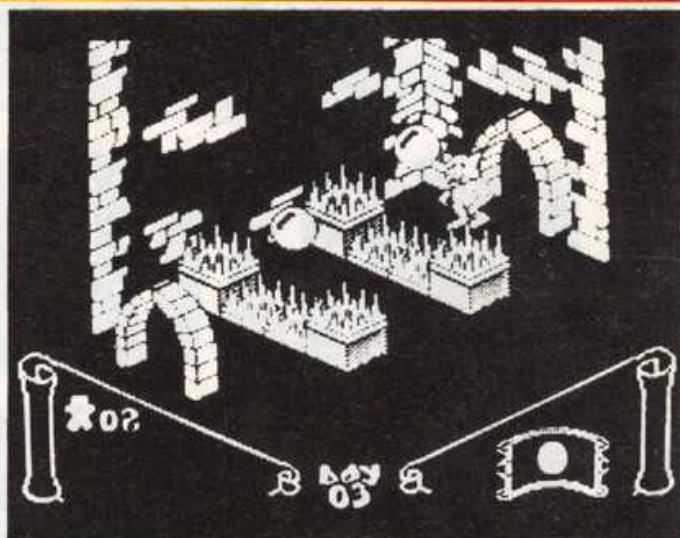
lity is linked to a built-in speech synthesiser to provide preprogrammed replies and a message facility automatically records incoming data. OPD also features a built-in calculator and clock.

One Per Desk will be available in January.

Oric rights go to Tansoft

HOT on the heels of the announcement by Oric (see *Popular Computing Weekly*, November 15) of three new micros planned for next spring, the company has given sole UK marketing rights of all Oric products — including the Atmos — to Tansoft.

continued on page 5▶



ULTIMATE's latest game for the Spectrum — *Knight Lore* — features impressive 3D graphics and is available on cassette, priced at £9.95.

QL No. 2

SINCLAIR is planning to launch a second QL model in the spring of next year.

The machine — pitched slightly up-market from the present QL — will differ in that it will have a redesigned circuit board, modified to accommodate Psion's *Xchange* suite of programs — the more sophisticated versions of the present four QL packages — as a built-in extension of the machine's Rom.

Having the packages built in this way offers a number of advantages. Using the packages is simpler and easier — they no longer need to be loaded from Microdrive and

system access to Rom is faster than from Ram. True multi-tasking is possible and jobs running on any or all of the packages can be run concurrently. The exchange of data between the four packages is quicker. Finally, because the software is provided in five Rom chips (160K in all) the full 128K of Ram is available as work-space.

The Psion *Xchange* Roms in the new QL model will be very similar to those provided in ICL's new One Per Desk project launched last week (see the separate report, this page). The Rom versions are faster

continued on page 5▶

INSIDE } READERS CHART WEEK 2 } QL LANGUAGES



PICTURE YOURSELF ON TV.

■ We're not the only people who think 'Art Master' and 'Picture Builder' are two quite exceptional computer graphics software programs.

■ Tony and Rolf do, too. Otherwise they'd never have agreed to put their name to them.

■ With both 'Art Master' and 'Picture Builder' you can create full colour pictures on your own T.V. screen.

■ And believe us when we say those pictures will match

the best computer graphics you have ever seen.

■ Anywhere.

■ The pictures are drawn using either the keyboard or a joystick, and can be stored on either tape or on disk.

■ With 'Picture Builder' you are presented with a palette of 121 colour shades (more than enough for any budding Michaelangelo).

■ And a collection of character sets totalling over 250 shapes.

■ So you're hardly stumped for choice.

■ You simply choose your colours and characters, then 'build up' your picture. Just like any other artist.

■ With 'Art Master' you again get a choice of 121 colour shades.

■ But this time you can draw whatever shapes you like, creating your very own high resolution masterpiece from a blank screen.

■ It is even possible to draw circles, and store and then recall a back-up picture – which is more than you can do with other graphics programs.

■ Everyone, from the six

year old right up to the 66 year old, will enjoy 'Art Master' and 'Picture Builder'.

■ Like all of our software, they have been specifically designed to get the best out of Commodore hardware.

■ That's why you can't choose better.

■ Commodore software: it costs no more, even though there's more to it.

commodore
COMPUTER SOFTWARE



■ PICTURE BUILDER ON CASSETTE. ART MASTER ON CASSETTE OR DISK. EACH £9.99.

>View

Do you ever wonder what happens to the people involved with companies which have crashed spectacularly after they fall from the headlines?

Take Imagine, for example. A substantial sum of money — over £1m — was owed by the company when it folded.

Yet since the company went down in July all of its directors and senior employees have now resurfaced.

Imagine managing director Mark Butler is working for Voyager Software. Bruce Everiss — Imagine's operations director — after a spell doing PR work for Yamaha, has decided to accept a job as managing director of Tansoft. Ian MacPherson — Imagine's credit control manager — is now occupying a similar post at distributor Microdealer. John Gibson — one of Imagine's top programmers — has formed a new company — Denton Designs — together with eight other former Imagine programmers working on contract work for Beyond and Ocean.

A bizarre twist is the Sinclair connection. After spending a short vacation in the US, Ian Hetherington — Imagine's financial director — has teamed up with Imagine chairman, Dave Lawson in another new company, Fireiron, to continue work on the Imagine Megagames for Sinclair. They are now on a reportedly hefty retainer from Sinclair being paid to continue the same programming work started before Imagine went down.

Even the Imagine name is to live on — Beau Jolly will continue to sell the company's back catalogue and Ocean will develop new titles to sell under the Imagine label.

In one sense nothing much seems to have changed.

In the future, though, things may be a little different for directors involved with such companies. The Government is to introduce in this session of parliament its Insolvency Bill aimed at tightening the regulations regarding company failures.

One of the intentions of the bill is to make directors more accountable in the event of a company's failure and, in particular, to prohibit the holding of directorships by individuals with a history of company insolvencies.

POPULAR Computing WEEKLY

Vol 3 No 47

>Presents...

News > Imagine sale > Electron discs

5

Star Game > Arcade action in a two-player game *Porter* for the Spectrum 48K

10

Streetlife > Christina Erskine interfaces with the team at Compunet

14

Software Reviews > See the film...play the game with *Ghostbusters* > Mysterious adventure in *Wrath of Magra*

16

QL Languages > Pascal, BCPL and Lisp for the QL appraised by Adam Denning

20

Competition > Your chance to design a top arcade game... read on!

25

Commodore 64 > If you have the questions, then Dominick Devlin has the answers.

26

Dragon > Part Two of our machine-code scrolling routines by Roger Walton

33

Amstrad > Finish getting organised with Part Two of *Microfile* by Peter Patton

36

BBC & Electron > Baffled by ballistics? Not after *Projectiles* by P Whitehurst

40

Best of the Rest > Letters 7 > Open Forum 44 > Arcade Avenue 44 > Microradio 45 > Baud Wald 46 > Book Ends 49 > Music Box 51 > Adventure Corner 55 > Peek & Poke 57 > Adventure Helpline 65 > Top 10, Diary, Readers Chart 66 > New Releases 67 > This Week 67 > Puzzle, Ziggurat, Hackers 70



>Futures...

Astrocrash — next week's star game on the Commodore 64...get rid of the bugs in the QL Rom

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 WC2H 7PP. 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 SM Distribution, London SW9, tel 01-274 8611, 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.

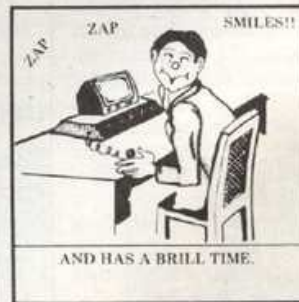
Computer Trade Association Magazine of the Year

WILDEST DREAMS

Software Rental

Just a couple of questions for the computer gamer

1. When did you buy your last computer game?
2. How often have you played it?



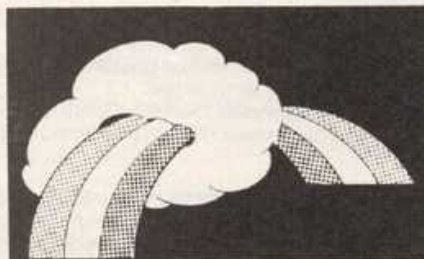
Buying software can seem a pretty bad deal when you pay £5.99 for only a couple of hours play.

Well, now you can visit the Circus, help King Clive in his dungeon, beat the computer on your Lazer Byke, explore deep space, eat your way through a cheese warehouse and get totally infuriated by the Mazeball, all for less than the price of one new cassette.

How? well, if you go down to your Video dealer today, you're in for a big surprise. He can hire you a Wildest Dream rental cassette for your Spectrum or Commodore 64, featuring one of these games, at a very reasonable price (say about one tenth the price of a good recent game ...)

And its not somebody else's old stock were trying to hire you. These are all brand new games that you've never seen before in the shops - and you won't see them in the shops later.

Only through your local Video dealer can you hire Wildest Dreams rental software.



CONTACT:- Chris Kilburn
WILDEST DREAMS
P.O. BOX 84,
COVENTRY.
Tel: (0203) 663085

Tansoft

◀continued from page 1

Bruce Everiss, ex-Operations Manager of the failed Liverpool-based software company, Imagine, has been selected as managing director of the new-look Tansoft.

"I've always felt that the Atmos was let down by lack of marketing," he commented. "At £150 with a proper keyboard it knocks the socks off the Electron." His appointment as Tansoft managing director follows a recent shake-up at Tansoft which saw the departure of his former chief Paul Kaufmann, and the appointment of Oric managing director Barry Muncaster as Tansoft chairman.

Moderate turnout at ZX fair

THIS year's Christmas ZX Fair, held last weekend at Alexandra Pavillion attracted moderate crowds but few exhibitors.

By the second day of the show Sinclair was offering a free ZX81 with every QL bought and by the end was knocking £20 off the QL's £399 price.

In contrast — rather surprisingly — the 6809 Show for Dragon and Tandy owners, held over the same weekend, attracted large crowds.

Adventures for CBM 64

A NEW range of Commodore 64 games based on books by top science-fiction authors like Ray Bradbury and Arthur C Clarke are soon to be available in this country.

The programs have been written by the American software house Trillium which specialises in sophisticated adven-



Atari price cut in US

ATARI Corporation in the US has announced its intention to further reduce the cost of its 800XL computer by almost a third, from \$179 to \$120 (about £100).

New Acorn products at Compec

ACORN has announced a number of new products for its BBC and Electron machine's at this year's Compec Show, held last week.

The Plus 3 add-on for the Electron gives the micro a neat 3½inch single-sided disc drive and interface package, providing 300K of storage. The Plus 3 is available now, price £229. An RS432 communications interface for the Electron is also planned.

For the BBC micro, Acorn launched its Music 500 music synthesiser and optional add-on music keyboard. The

synthesiser itself costs £199. Two languages were on show — ISO Pascal, available now, and Logo available in December. Both are priced at £69.

On the business side Acorn launched a Winchester hard disc unit for the BBC costing £1,499 for a 10M system and £2,299 for a 30M system — both available now. Its long-awaited 32016 32-bit second processor option was also shown. Bundled with five languages — BBC Basic C, Fortran 77, Lisp and Pascal — the whole package costs £899 and will be available in early 1985.



Acorn's Plus 3 add-on

ture games — so-called interactive fiction — based on science-fiction book titles.

The titles include software based on *Rendezvous with Rama* by Arthur C Clarke, *Fahrenheit 451* by Ray Bradbury, *Dragonword* by Preiss and Reaves, *Amazon* by Michael Crichton and *Shadowkeep* by Alan Dean Foster.

All are disc based C64 titles — because of the amount of text and graphics involved — and will retail for £19.95.

The titles are to be distributed in the UK by WHS Distribution, a subsidiary of W H Smith, and will be available from the end of this month.

The price drop has led to speculation that the UK price of £169.99 might also soon be reduced. Commented Atari Corporation UK's managing director Simon Westbrook, "There are no plans at present to reduce the price but I could not rule it out in the future."

Second QL

◀continued from page 1

and more compact (in memory terms) than the disc-based *Xchange* suites for the IBM PC, Apricot and others because, instead of being written in C, the packages have been hand-coded in machine-code.

The up-market version of the QL is expected to sell for around £500 and Sinclair apparently intends to market it in parallel with the present £399 model.

As for export, it seems likely that Sinclair will concentrate its efforts on the new QL model.

Sinclair may well launch the more expensive QL model in the US in the New Year, in preference to the present version.

Going, going... still going

THE last remaining assets of Imagine, the failed Liverpool software house, are to be sold off by public tender in December.

The equipment, including 15 Sage microcomputers, 20 portable colour TVs, executive desks, armchairs and typists' chairs, will be on view on December 10 and 11.

Details from the auctioneer's offices, Turner and Son, 28-36 Roscoe Street, Liverpool L1 (051 709 4005).

Slow start for retailers

MAJOR retail chains, both in the UK and in the US are experiencing a slow start to Christmas hardware sales.

In the US, sales of the Commodore 64 are apparently down between 10 and 30% from last year's figures.

The Commodore 64 accounts for more than 50% of all under \$500 micros in the States. Its only competitors are the Atari 800XL, which has only shown a slight sales rise after a price cut down to \$179, and Coleco's Adam, for which sales have been disappointing.

Although in Britain the marketplace is more competitive, with a greater variety of machines, it seems that here, too, sales are not much up on last year. Peter Frost, of Boots computer buying department, said: "It is still anyone's guess whether the market will develop as it did last year. I don't

think our sales this Christmas will be worse than last year, but they may not be better."

Dave Bryant, sales manager for home computers at Spectrum group, commented: "The trend has certainly slowed down so far this year, but with TV advertising from a number of companies, including Commodore, I think there will be a big surge in December." At W H Smith, George Bradbury added: "The market is taking a while to get going, but it's okay now."

All three commented that the C16 and the Spectrum+ are currently selling well.

Views on MSX machines now reaching the shops were mixed. "It looks as though MSX micros will be few and far between this Christmas," said Dave Bryant. "The Toshiba is selling, but, frankly, not very well," added Peter Frost.

SHARDS SOFTWARE PRESENTS ... for SPECTRUM 48k

GALILEE

The long awaited sequel to
JERICO ROAD

Galilee is an extensive text adventure with graphics. As the story unfolds you will become entangled in the drama that surrounded the early days of the Christian era.

£5.75

Written by Peter Goodlad - Author
of **JERICO ROAD**.

WORLDS APART

SHARDS



Played on 7 full Graphic
World Maps

EMPIRE

THWART THE PLANS OF THE
EVIL EMPIRE AS IT ATTEMPTS
TO CONQUER THE WORLD.

£6.95

"An extremely good game ... highly
recommended." *Personal Computer News*

"This is a terrific game ... visually
attractive and highly addictive."
Home Computing Weekly

CBM 64
Atari Spectrum
BBC - Dragon and
Tandy Colour



**Selected
Stores**

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

Cry from a Commodore

I own a CBM 64, and on my own behalf and that of my fellow 64 users, I would like to ask if Ultimate are bringing their Spectrum classics out for our machine?

N Brailsford
Chesterfield
Derbyshire

No idea — Ultimate never tell anyone anything.

Watered down Rocky

I read with interest the News Desk item regarding CRL's intended computer game version of 'The Rocky Horror Show' (PCW 8-14 Nov) and felt moved to make the following observations.

Clement Chambers, CRL's MD, stated that he intended his game to derive its appeal from the show's 'strange environments' and to avoid what he describes as 'the elements of dubious taste' in the show.

Come on Mr Chambers. Without wishing to seem in any way rude, you must have had your head in the sand these last few years! The show has enjoyed a cult following for precisely these 'dubious' reasons.

The central character in the show is undoubtedly Frank'n Furter, the corset wearing, whip toting Mad Scientist, so ably portrayed in the original show (and movie) by Tim Curry. And of course, the one song from the show to become an enduring favourite, and to stay in most people's minds is 'Sweet Transvestite' (from Transsexual Transylvania...).

Remove these elements and you might as well just produce yet another cloned-to-indifference platform game!

Please, Mr Chambers, don't let 'Rocky Horror' fans down. Don't remove the teeth from the beast! 'Rocky' was suggestive, yes, but never, never offensive. It was (and is) a radical entertainment, and it would be a mistake of the first order to use it's name on a product which was not true to the spirit of the original!

Having got that off my chest,

I would just like to thank PCW for it's Amstrad Page. Its good to see a popular computing magazine devote so much space to this wonderful machine. Keep up the good work!

Rob Baxter
50 Milton Grove
Whalley Range
Manchester

Copy comment

With respect to the Ziggurat article by Tony Kendle about applying CP/M to the home computer market, it is worth pointing out that with CP/M, it is fairly easy to copy programs, using PIP.

If home micro users have no qualms about copying a £5 game, many of which are highly protected, how will they feel about a £300 word-processor?

Andrew Simmons
Demon Software
3 High Street
Drybrook
Glos

Scribble update

The Scribble program for the Amstrad written by Brian and David Lewis in the October 25 issue is good but the cursor can occasionally disappear.

If Lines 110 to 140 and Line 370 are amended as shown it will solve the problem.

```
110 IF INKEY=0 THEN GOTO 130
120 IF INKEY=1 THEN GOTO 130
130 IF INKEY=2 THEN GOTO 130
140 IF INKEY=3 THEN GOTO 130
150 IF INKEY=4 THEN GOTO 130
160 IF INKEY=5 THEN GOTO 130
170 IF INKEY=6 THEN GOTO 130
180 IF INKEY=7 THEN GOTO 130
190 IF INKEY=8 THEN GOTO 130
200 IF INKEY=9 THEN GOTO 130
210 IF INKEY=10 THEN GOTO 130
220 IF INKEY=11 THEN GOTO 130
230 IF INKEY=12 THEN GOTO 130
240 IF INKEY=13 THEN GOTO 130
250 IF INKEY=14 THEN GOTO 130
260 IF INKEY=15 THEN GOTO 130
270 IF INKEY=16 THEN GOTO 130
280 IF INKEY=17 THEN GOTO 130
290 IF INKEY=18 THEN GOTO 130
300 IF INKEY=19 THEN GOTO 130
310 IF INKEY=20 THEN GOTO 130
320 IF INKEY=21 THEN GOTO 130
330 IF INKEY=22 THEN GOTO 130
340 IF INKEY=23 THEN GOTO 130
350 IF INKEY=24 THEN GOTO 130
360 IF INKEY=25 THEN GOTO 130
370 IF INKEY=26 THEN GOTO 130
380 IF INKEY=27 THEN GOTO 130
390 IF INKEY=28 THEN GOTO 130
400 IF INKEY=29 THEN GOTO 130
410 IF INKEY=30 THEN GOTO 130
420 IF INKEY=31 THEN GOTO 130
430 IF INKEY=32 THEN GOTO 130
440 IF INKEY=33 THEN GOTO 130
450 IF INKEY=34 THEN GOTO 130
460 IF INKEY=35 THEN GOTO 130
470 IF INKEY=36 THEN GOTO 130
480 IF INKEY=37 THEN GOTO 130
490 IF INKEY=38 THEN GOTO 130
500 IF INKEY=39 THEN GOTO 130
510 IF INKEY=40 THEN GOTO 130
520 IF INKEY=41 THEN GOTO 130
530 IF INKEY=42 THEN GOTO 130
540 IF INKEY=43 THEN GOTO 130
550 IF INKEY=44 THEN GOTO 130
560 IF INKEY=45 THEN GOTO 130
570 IF INKEY=46 THEN GOTO 130
580 IF INKEY=47 THEN GOTO 130
590 IF INKEY=48 THEN GOTO 130
600 IF INKEY=49 THEN GOTO 130
610 IF INKEY=50 THEN GOTO 130
620 IF INKEY=51 THEN GOTO 130
630 IF INKEY=52 THEN GOTO 130
640 IF INKEY=53 THEN GOTO 130
650 IF INKEY=54 THEN GOTO 130
660 IF INKEY=55 THEN GOTO 130
670 IF INKEY=56 THEN GOTO 130
680 IF INKEY=57 THEN GOTO 130
690 IF INKEY=58 THEN GOTO 130
700 IF INKEY=59 THEN GOTO 130
710 IF INKEY=60 THEN GOTO 130
720 IF INKEY=61 THEN GOTO 130
730 IF INKEY=62 THEN GOTO 130
740 IF INKEY=63 THEN GOTO 130
750 IF INKEY=64 THEN GOTO 130
760 IF INKEY=65 THEN GOTO 130
770 IF INKEY=66 THEN GOTO 130
780 IF INKEY=67 THEN GOTO 130
790 IF INKEY=68 THEN GOTO 130
800 IF INKEY=69 THEN GOTO 130
810 IF INKEY=70 THEN GOTO 130
820 IF INKEY=71 THEN GOTO 130
830 IF INKEY=72 THEN GOTO 130
840 IF INKEY=73 THEN GOTO 130
850 IF INKEY=74 THEN GOTO 130
860 IF INKEY=75 THEN GOTO 130
870 IF INKEY=76 THEN GOTO 130
880 IF INKEY=77 THEN GOTO 130
890 IF INKEY=78 THEN GOTO 130
900 IF INKEY=79 THEN GOTO 130
910 IF INKEY=80 THEN GOTO 130
920 IF INKEY=81 THEN GOTO 130
930 IF INKEY=82 THEN GOTO 130
940 IF INKEY=83 THEN GOTO 130
950 IF INKEY=84 THEN GOTO 130
960 IF INKEY=85 THEN GOTO 130
970 IF INKEY=86 THEN GOTO 130
980 IF INKEY=87 THEN GOTO 130
990 IF INKEY=88 THEN GOTO 130
1000 IF INKEY=89 THEN GOTO 130
1010 IF INKEY=90 THEN GOTO 130
1020 IF INKEY=91 THEN GOTO 130
1030 IF INKEY=92 THEN GOTO 130
1040 IF INKEY=93 THEN GOTO 130
1050 IF INKEY=94 THEN GOTO 130
1060 IF INKEY=95 THEN GOTO 130
1070 IF INKEY=96 THEN GOTO 130
1080 IF INKEY=97 THEN GOTO 130
1090 IF INKEY=98 THEN GOTO 130
1100 IF INKEY=99 THEN GOTO 130
1110 IF INKEY=100 THEN GOTO 130
1120 IF INKEY=101 THEN GOTO 130
1130 IF INKEY=102 THEN GOTO 130
1140 IF INKEY=103 THEN GOTO 130
1150 IF INKEY=104 THEN GOTO 130
1160 IF INKEY=105 THEN GOTO 130
1170 IF INKEY=106 THEN GOTO 130
1180 IF INKEY=107 THEN GOTO 130
1190 IF INKEY=108 THEN GOTO 130
1200 IF INKEY=109 THEN GOTO 130
1210 IF INKEY=110 THEN GOTO 130
1220 IF INKEY=111 THEN GOTO 130
1230 IF INKEY=112 THEN GOTO 130
1240 IF INKEY=113 THEN GOTO 130
1250 IF INKEY=114 THEN GOTO 130
1260 IF INKEY=115 THEN GOTO 130
1270 IF INKEY=116 THEN GOTO 130
1280 IF INKEY=117 THEN GOTO 130
1290 IF INKEY=118 THEN GOTO 130
1300 IF INKEY=119 THEN GOTO 130
1310 IF INKEY=120 THEN GOTO 130
1320 IF INKEY=121 THEN GOTO 130
1330 IF INKEY=122 THEN GOTO 130
1340 IF INKEY=123 THEN GOTO 130
1350 IF INKEY=124 THEN GOTO 130
1360 IF INKEY=125 THEN GOTO 130
1370 IF INKEY=126 THEN GOTO 130
1380 IF INKEY=127 THEN GOTO 130
1390 IF INKEY=128 THEN GOTO 130
1400 IF INKEY=129 THEN GOTO 130
1410 IF INKEY=130 THEN GOTO 130
1420 IF INKEY=131 THEN GOTO 130
1430 IF INKEY=132 THEN GOTO 130
1440 IF INKEY=133 THEN GOTO 130
1450 IF INKEY=134 THEN GOTO 130
1460 IF INKEY=135 THEN GOTO 130
1470 IF INKEY=136 THEN GOTO 130
1480 IF INKEY=137 THEN GOTO 130
1490 IF INKEY=138 THEN GOTO 130
1500 IF INKEY=139 THEN GOTO 130
1510 IF INKEY=140 THEN GOTO 130
1520 IF INKEY=141 THEN GOTO 130
1530 IF INKEY=142 THEN GOTO 130
1540 IF INKEY=143 THEN GOTO 130
1550 IF INKEY=144 THEN GOTO 130
1560 IF INKEY=145 THEN GOTO 130
1570 IF INKEY=146 THEN GOTO 130
1580 IF INKEY=147 THEN GOTO 130
1590 IF INKEY=148 THEN GOTO 130
1600 IF INKEY=149 THEN GOTO 130
1610 IF INKEY=150 THEN GOTO 130
1620 IF INKEY=151 THEN GOTO 130
1630 IF INKEY=152 THEN GOTO 130
1640 IF INKEY=153 THEN GOTO 130
1650 IF INKEY=154 THEN GOTO 130
1660 IF INKEY=155 THEN GOTO 130
1670 IF INKEY=156 THEN GOTO 130
1680 IF INKEY=157 THEN GOTO 130
1690 IF INKEY=158 THEN GOTO 130
1700 IF INKEY=159 THEN GOTO 130
1710 IF INKEY=160 THEN GOTO 130
1720 IF INKEY=161 THEN GOTO 130
1730 IF INKEY=162 THEN GOTO 130
1740 IF INKEY=163 THEN GOTO 130
1750 IF INKEY=164 THEN GOTO 130
1760 IF INKEY=165 THEN GOTO 130
1770 IF INKEY=166 THEN GOTO 130
1780 IF INKEY=167 THEN GOTO 130
1790 IF INKEY=168 THEN GOTO 130
1800 IF INKEY=169 THEN GOTO 130
1810 IF INKEY=170 THEN GOTO 130
1820 IF INKEY=171 THEN GOTO 130
1830 IF INKEY=172 THEN GOTO 130
1840 IF INKEY=173 THEN GOTO 130
1850 IF INKEY=174 THEN GOTO 130
1860 IF INKEY=175 THEN GOTO 130
1870 IF INKEY=176 THEN GOTO 130
1880 IF INKEY=177 THEN GOTO 130
1890 IF INKEY=178 THEN GOTO 130
1900 IF INKEY=179 THEN GOTO 130
1910 IF INKEY=180 THEN GOTO 130
1920 IF INKEY=181 THEN GOTO 130
1930 IF INKEY=182 THEN GOTO 130
1940 IF INKEY=183 THEN GOTO 130
1950 IF INKEY=184 THEN GOTO 130
1960 IF INKEY=185 THEN GOTO 130
1970 IF INKEY=186 THEN GOTO 130
1980 IF INKEY=187 THEN GOTO 130
1990 IF INKEY=188 THEN GOTO 130
2000 IF INKEY=189 THEN GOTO 130
2010 IF INKEY=190 THEN GOTO 130
2020 IF INKEY=191 THEN GOTO 130
2030 IF INKEY=192 THEN GOTO 130
2040 IF INKEY=193 THEN GOTO 130
2050 IF INKEY=194 THEN GOTO 130
2060 IF INKEY=195 THEN GOTO 130
2070 IF INKEY=196 THEN GOTO 130
2080 IF INKEY=197 THEN GOTO 130
2090 IF INKEY=198 THEN GOTO 130
2100 IF INKEY=199 THEN GOTO 130
2110 IF INKEY=200 THEN GOTO 130
2120 IF INKEY=201 THEN GOTO 130
2130 IF INKEY=202 THEN GOTO 130
2140 IF INKEY=203 THEN GOTO 130
2150 IF INKEY=204 THEN GOTO 130
2160 IF INKEY=205 THEN GOTO 130
2170 IF INKEY=206 THEN GOTO 130
2180 IF INKEY=207 THEN GOTO 130
2190 IF INKEY=208 THEN GOTO 130
2200 IF INKEY=209 THEN GOTO 130
2210 IF INKEY=210 THEN GOTO 130
2220 IF INKEY=211 THEN GOTO 130
2230 IF INKEY=212 THEN GOTO 130
2240 IF INKEY=213 THEN GOTO 130
2250 IF INKEY=214 THEN GOTO 130
2260 IF INKEY=215 THEN GOTO 130
2270 IF INKEY=216 THEN GOTO 130
2280 IF INKEY=217 THEN GOTO 130
2290 IF INKEY=218 THEN GOTO 130
2300 IF INKEY=219 THEN GOTO 130
2310 IF INKEY=220 THEN GOTO 130
2320 IF INKEY=221 THEN GOTO 130
2330 IF INKEY=222 THEN GOTO 130
2340 IF INKEY=223 THEN GOTO 130
2350 IF INKEY=224 THEN GOTO 130
2360 IF INKEY=225 THEN GOTO 130
2370 IF INKEY=226 THEN GOTO 130
2380 IF INKEY=227 THEN GOTO 130
2390 IF INKEY=228 THEN GOTO 130
2400 IF INKEY=229 THEN GOTO 130
2410 IF INKEY=230 THEN GOTO 130
2420 IF INKEY=231 THEN GOTO 130
2430 IF INKEY=232 THEN GOTO 130
2440 IF INKEY=233 THEN GOTO 130
2450 IF INKEY=234 THEN GOTO 130
2460 IF INKEY=235 THEN GOTO 130
2470 IF INKEY=236 THEN GOTO 130
2480 IF INKEY=237 THEN GOTO 130
2490 IF INKEY=238 THEN GOTO 130
2500 IF INKEY=239 THEN GOTO 130
2510 IF INKEY=240 THEN GOTO 130
2520 IF INKEY=241 THEN GOTO 130
2530 IF INKEY=242 THEN GOTO 130
2540 IF INKEY=243 THEN GOTO 130
2550 IF INKEY=244 THEN GOTO 130
2560 IF INKEY=245 THEN GOTO 130
2570 IF INKEY=246 THEN GOTO 130
2580 IF INKEY=247 THEN GOTO 130
2590 IF INKEY=248 THEN GOTO 130
2600 IF INKEY=249 THEN GOTO 130
2610 IF INKEY=250 THEN GOTO 130
2620 IF INKEY=251 THEN GOTO 130
2630 IF INKEY=252 THEN GOTO 130
2640 IF INKEY=253 THEN GOTO 130
2650 IF INKEY=254 THEN GOTO 130
2660 IF INKEY=255 THEN GOTO 130
2670 IF INKEY=256 THEN GOTO 130
2680 IF INKEY=257 THEN GOTO 130
2690 IF INKEY=258 THEN GOTO 130
2700 IF INKEY=259 THEN GOTO 130
2710 IF INKEY=260 THEN GOTO 130
2720 IF INKEY=261 THEN GOTO 130
2730 IF INKEY=262 THEN GOTO 130
2740 IF INKEY=263 THEN GOTO 130
2750 IF INKEY=264 THEN GOTO 130
2760 IF INKEY=265 THEN GOTO 130
2770 IF INKEY=266 THEN GOTO 130
2780 IF INKEY=267 THEN GOTO 130
2790 IF INKEY=268 THEN GOTO 130
2800 IF INKEY=269 THEN GOTO 130
2810 IF INKEY=270 THEN GOTO 130
2820 IF INKEY=271 THEN GOTO 130
2830 IF INKEY=272 THEN GOTO 130
2840 IF INKEY=273 THEN GOTO 130
2850 IF INKEY=274 THEN GOTO 130
2860 IF INKEY=275 THEN GOTO 130
2870 IF INKEY=276 THEN GOTO 130
2880 IF INKEY=277 THEN GOTO 130
2890 IF INKEY=278 THEN GOTO 130
2900 IF INKEY=279 THEN GOTO 130
2910 IF INKEY=280 THEN GOTO 130
2920 IF INKEY=281 THEN GOTO 130
2930 IF INKEY=282 THEN GOTO 130
2940 IF INKEY=283 THEN GOTO 130
2950 IF INKEY=284 THEN GOTO 130
2960 IF INKEY=285 THEN GOTO 130
2970 IF INKEY=286 THEN GOTO 130
2980 IF INKEY=287 THEN GOTO 130
2990 IF INKEY=288 THEN GOTO 130
3000 IF INKEY=289 THEN GOTO 130
3010 IF INKEY=290 THEN GOTO 130
3020 IF INKEY=291 THEN GOTO 130
3030 IF INKEY=292 THEN GOTO 130
3040 IF INKEY=293 THEN GOTO 130
3050 IF INKEY=294 THEN GOTO 130
3060 IF INKEY=295 THEN GOTO 130
3070 IF INKEY=296 THEN GOTO 130
3080 IF INKEY=297 THEN GOTO 130
3090 IF INKEY=298 THEN GOTO 130
3100 IF INKEY=299 THEN GOTO 130
3110 IF INKEY=300 THEN GOTO 130
3120 IF INKEY=301 THEN GOTO 130
3130 IF INKEY=302 THEN GOTO 130
3140 IF INKEY=303 THEN GOTO 130
3150 IF INKEY=304 THEN GOTO 130
3160 IF INKEY=305 THEN GOTO 130
3170 IF INKEY=306 THEN GOTO 130
3180 IF INKEY=307 THEN GOTO 130
3190 IF INKEY=308 THEN GOTO 130
3200 IF INKEY=309 THEN GOTO 130
3210 IF INKEY=310 THEN GOTO 130
3220 IF INKEY=311 THEN GOTO 130
3230 IF INKEY=312 THEN GOTO 130
3240 IF INKEY=313 THEN GOTO 130
3250 IF INKEY=314 THEN GOTO 130
3260 IF INKEY=315 THEN GOTO 130
3270 IF INKEY=316 THEN GOTO 130
3280 IF INKEY=317 THEN GOTO 130
3290 IF INKEY=318 THEN GOTO 130
3300 IF INKEY=319 THEN GOTO 130
3310 IF INKEY=320 THEN GOTO 130
3320 IF INKEY=321 THEN GOTO 130
3330 IF INKEY=322 THEN GOTO 130
3340 IF INKEY=323 THEN GOTO 130
3350 IF INKEY=324 THEN GOTO 130
3360 IF INKEY=325 THEN GOTO 130
3370 IF INKEY=326 THEN GOTO 130
3380 IF INKEY=327 THEN GOTO 130
3390 IF INKEY=328 THEN GOTO 130
3400 IF INKEY=329 THEN GOTO 130
3410 IF INKEY=330 THEN GOTO 130
3420 IF INKEY=331 THEN GOTO 130
3430 IF INKEY=332 THEN GOTO 130
3440 IF INKEY=333 THEN GOTO 130
3450 IF INKEY=334 THEN GOTO 130
3460 IF INKEY=335 THEN GOTO 130
3470 IF INKEY=336 THEN GOTO 130
3480 IF INKEY=337 THEN GOTO 130
3490 IF INKEY=338 THEN GOTO 130
3500 IF INKEY=339 THEN GOTO 130
3510 IF INKEY=340 THEN GOTO 130
3520 IF INKEY=341 THEN GOTO 130
3530 IF INKEY=342 THEN GOTO 130
3540 IF INKEY=343 THEN GOTO 130
3550 IF INKEY=344 THEN GOTO 130
3560 IF INKEY=345 THEN GOTO 130
3570 IF INKEY=346 THEN GOTO 130
3580 IF INKEY=347 THEN GOTO 130
3590 IF INKEY=348 THEN GOTO 130
3600 IF INKEY=349 THEN GOTO 130
3610 IF INKEY=350 THEN GOTO 130
3620 IF INKEY=351 THEN GOTO 130
3630 IF INKEY=352 THEN GOTO 130
3640 IF INKEY=353 THEN GOTO 130
3650 IF INKEY=354 THEN GOTO 130
3660 IF INKEY=355 THEN GOTO 130
3670 IF INKEY=356 THEN GOTO 130
3680 IF INKEY=357 THEN GOTO 130
3690 IF INKEY=358 THEN GOTO 130
3700 IF INKEY=359 THEN GOTO 130
3710 IF INKEY=360 THEN GOTO 130
3720 IF INKEY=361 THEN GOTO 130
3730 IF INKEY=362 THEN GOTO 130
3740 IF INKEY=363 THEN GOTO 130
3750 IF INKEY=364 THEN GOTO 130
3760 IF INKEY=365 THEN GOTO 130
3770 IF INKEY=366 THEN GOTO 130
3780 IF INKEY=367 THEN GOTO 130
3790 IF INKEY=368 THEN GOTO 130
3800 IF INKEY=369 THEN GOTO 130
3810 IF INKEY=370 THEN GOTO 130
3820 IF INKEY=371 THEN GOTO 130
3830 IF INKEY=372 THEN GOTO 130
3840 IF INKEY=373 THEN GOTO 130
3850 IF INKEY=374 THEN GOTO 130
3860 IF INKEY=375 THEN GOTO 130
3870 IF INKEY=376 THEN GOTO 130
3880 IF INKEY=377 THEN GOTO 130
3890 IF INKEY=378 THEN GOTO 130
3900 IF INKEY=379 THEN GOTO 130
3910 IF INKEY=380 THEN GOTO 130
3920 IF INKEY=381 THEN GOTO 130
3930 IF INKEY=382 THEN GOTO 130
3940 IF INKEY=383 THEN GOTO 130
3950 IF INKEY=384 THEN GOTO 130
3960 IF INKEY=385 THEN GOTO 130
3970 IF INKEY=386 THEN GOTO 130
3980 IF INKEY=387 THEN GOTO 130
3990 IF INKEY=388 THEN GOTO 130
4000 IF INKEY=389 THEN GOTO 130
4010 IF INKEY=390 THEN GOTO 130
4020 IF INKEY=391 THEN GOTO 130
4030 IF INKEY=392 THEN GOTO 130
4040 IF INKEY=393 THEN GOTO 130
4050 IF INKEY=394 THEN GOTO 130
4060 IF INKEY=395 THEN GOTO 130
4070 IF INKEY=396 THEN GOTO 130
4080 IF INKEY=397 THEN GOTO 130
4090 IF INKEY=398 THEN GOTO 130
4100 IF INKEY=399 THEN GOTO 130
4110 IF INKEY=400 THEN GOTO 130
4120 IF INKEY=401 THEN GOTO 130
4130 IF INKEY=402 THEN GOTO 130
4140 IF INKEY=403 THEN GOTO 130
4150 IF INKEY=404 THEN GOTO 130
4160 IF INKEY=405 THEN GOTO 130
4170 IF INKEY=406 THEN GOTO 130
4180 IF INKEY=407 THEN GOTO 130
4190 IF INKEY=408 THEN GOTO 130
4200 IF INKEY=409 THEN GOTO 130
4210 IF INKEY=410 THEN GOTO 130
4220 IF INKEY=411 THEN GOTO 130
4230 IF INKEY=412 THEN GOTO 130
4240 IF INKEY=413 THEN GOTO 130
4250 IF INKEY=414 THEN GOTO 130
4260 IF INKEY=415 THEN GOTO 130
4270 IF INKEY=416 THEN GOTO 130
4280 IF INKEY=417 THEN GOTO 130
4290 IF INKEY=418 THEN GOTO 130
4300 IF INKEY=419 THEN GOTO 130
4310 IF INKEY=420 THEN GOTO 130
4320 IF INKEY=421 THEN GOTO 130
4330 IF INKEY=422 THEN GOTO 130
4340 IF INKEY=423 THEN GOTO 130
4350 IF INKEY=424 THEN GOTO 130
4360 IF INKEY=425 THEN GOTO 130
4370 IF INKEY=426 THEN GOTO 130
4380 IF INKEY=427 THEN GOTO 130
4390 IF INKEY=428 THEN GOTO 130
4400 IF INKEY=429 THEN GOTO 130
4410 IF INKEY=430 THEN GOTO 130
4420 IF INKEY=431 THEN GOTO 130
4430 IF INKEY=432 THEN GOTO 130
4440 IF INKEY=433 THEN GOTO 130
4450 IF INKEY=434 THEN GOTO 130
4460 IF INKEY=435 THEN GOTO 130
4470 IF INKEY=436 THEN GOTO 130
4480 IF INKEY=437 THEN GOTO 130
4490 IF INKEY=438 THEN GOTO 130
4500 IF INKEY=439 THEN GOTO 130
4510 IF INKEY=440 THEN GOTO 130
4520 IF INKEY=441 THEN GOTO 130
4530 IF INKEY=442 THEN GOTO 130
4540 IF INKEY=443 THEN GOTO 130
4550 IF INKEY=444 THEN GOTO 130
4560 IF INKEY=445 THEN GOTO 130
4570 IF INKEY=446 THEN GOTO 130
4580 IF INKEY=447 THEN GOTO 130
4590 IF INKEY=448 THEN GOTO 130
4600 IF INKEY=449 THEN GOTO 130
4610 IF INKEY=450 THEN GOTO 130
4620 IF INKEY=451 THEN GOTO 130
4630 IF INKEY=452 THEN GOTO 130
4640 IF INKEY=453 THEN GOTO 130
4650 IF INKEY=454 THEN GOTO 130
4660 IF INKEY=455 THEN GOTO 130
4670 IF INKEY=456 THEN GOTO 130
4680 IF INKEY=457 THEN GOTO 130
4690 IF INKEY=458 THEN GOTO 130
4700 IF INKEY=459 THEN GOTO 130
4710 IF INKEY=460 THEN GOTO 130
4720 IF INKEY=461 THEN GOTO 130
4730 IF INKEY=462 THEN GOTO 130
4740 IF INKEY=463 THEN GOTO 130
4750 IF INKEY=464 THEN GOTO 130
4760 IF INKEY=465 THEN GOTO 130
4770 IF INKEY=466 THEN GOTO 130
4780 IF INKEY=467 THEN GOTO 130
4790 IF INKEY=468 THEN GOTO 130
4800 IF INKEY=469 THEN GOTO 130
4810 IF INKEY=470 THEN GOTO 130
4820 IF INKEY=471 THEN GOTO 130
4830 IF INKEY=472 THEN GOTO 130
4840 IF INKEY=473 THEN GOTO 130
4850 IF INKEY=474 THEN GOTO 130
4860 IF INKEY=475 THEN GOTO 130
4870 IF INKEY=476 THEN GOTO 130
4880 IF INKEY=477 THEN GOTO 130
4890 IF INKEY=478 THEN GOTO 130
4900 IF INKEY=479 THEN GOTO 130
4910 IF INKEY=480 THEN GOTO 130
4920 IF INKEY=481 THEN GOTO 130
4930 IF INKEY=482 THEN GOTO 130
4940 IF INKEY=483 THEN GOTO 130
4950 IF INKEY=484 THEN GOTO 130
4960 IF INKEY=485 THEN GOTO 130
4970 IF INKEY=486 THEN GOTO 130
4980 IF INKEY=487 THEN GOTO 130
4990 IF INKEY=488 THEN GOTO 130
5000 IF INKEY=489 THEN GOTO 130
5010 IF INKEY=490 THEN GOTO 130
5020 IF INKEY=491 THEN GOTO 130
5030 IF INKEY=492 THEN GOTO 130
5040 IF INKEY=493 THEN GOTO 130
5050 IF INKEY=494 THEN GOTO 130
5060 IF INKEY=495 THEN GOTO 130
5070 IF INKEY=496 THEN GOTO 130
5080 IF INKEY=497 THEN GOTO 130
5090 IF INKEY=498 THEN GOTO 130
5100 IF INKEY=499 THEN GOTO 130
5110 IF INKEY=500 THEN GOTO 130
5120 IF INKEY=501 THEN GOTO 130
5130 IF INKEY=502 THEN GOTO 130
5140 IF INKEY=503 THEN GOTO 130
5150 IF INKEY=504 THEN GOTO 130
5160 IF INKEY=505 THEN GOTO 130
5170 IF INKEY=506 THEN GOTO 130
5180 IF INKEY=507 THEN GOTO 130
5190 IF INKEY=508 THEN GOTO 130
5200 IF INKEY=509 THEN GOTO 130
5210 IF INKEY=510 THEN GOTO 130
5220 IF INKEY=511 THEN GOTO 130
5230 IF INKEY=512 THEN GOTO 130
5240 IF INKEY=513 THEN GOTO 130
5250 IF INKEY=514 THEN GOTO 130
5260 IF INKEY=515 THEN GOTO 130
5270 IF INKEY=516 THEN GOTO 130
5280 IF INKEY=517 THEN GOTO 130
5290 IF INKEY=518 THEN GOTO 130
5300 IF INKEY=519 THEN GOTO 130
5310 IF INKEY=520 THEN GOTO 130
5320 IF INKEY=521 THEN GOTO 130
5330 IF INKEY=522 THEN GOTO 130
5340 IF INKEY=523 THEN GOTO 130
5350 IF INKEY=524 THEN GOTO 130
5360 IF INKEY=525 THEN GOTO 130
5370 IF INKEY=526 THEN GOTO 130
5380 IF INKEY=527 THEN GOTO 130
5390 IF INKEY=528 THEN GOTO 130
5400 IF INKEY=529 THEN GOTO 130
5410 IF INKEY=530 THEN GOTO 130
5420 IF INKEY=531 THEN GOTO 130
5430 IF INKEY=532 THEN GOTO 130
5440 IF INKEY=533 THEN GOTO 130
5450 IF INKEY=534 THEN GOTO 130
5460 IF INKEY=535 THEN GOTO 130
5470 IF INKEY=536 THEN GOTO 130
5480 IF INKEY=537 THEN GOTO 130
5490 IF INKEY=538 THEN GOTO 130
5500 IF INKEY=539 THEN GOTO 130
5510 IF INKEY=540 THEN GOTO 130
5520 IF INKEY=541 THEN GOTO 130
5530 IF INKEY=542 THEN GOTO 130
5540 IF INKEY=543 THEN GOTO 130
5550 IF INKEY=544 THEN GOTO 130
5560 IF INKEY=545 THEN GOTO 130
5570 IF INKEY=546 THEN GOTO 130
5580 IF INKEY=547 THEN GOTO 130
5590 IF INKEY=548 THEN GOTO 130
5600 IF INKEY=549 THEN GOTO 130
5610 IF INKEY=550 THEN GOTO 130
5620 IF INKEY=551 THEN GOTO 130
5630 IF INKEY=552 THEN GOTO 130
5640 IF INKEY=553 THEN GOTO 130
5650 IF INKEY=554 THEN GOTO 130
5660 IF INKEY=555 THEN GOTO 130
5670 IF INKEY=556 THEN GOTO 130
5680 IF INKEY=557 THEN GOTO 130
5690 IF INKEY=558 THEN GOTO 130
5700 IF INKEY=559 THEN GOTO 130
5710 IF INKEY=560 THEN GOTO 130
5720 IF INKEY=561 THEN GOTO 130
5730 IF INKEY=562 THEN GOTO 130
5740 IF INKEY=563 THEN GOTO 130
5750 IF INKEY=564 THEN GOTO 130
5760 IF INKEY=565 THEN GOTO 130
5770 IF INKEY=566 THEN GOTO 130
5780 IF INKEY=567 THEN GOTO 130
5790 IF INKEY=568 THEN GOTO 130
5800 IF INKEY=569 THEN GOTO 130
5810 IF INKEY=570 THEN GOTO 130
5820 IF INKEY=571 THEN GOTO 130
5830 IF INKEY=572 THEN GOTO 130
5840 IF INKEY=573 THEN GOTO 130
5850 IF INKEY=574 THEN GOTO 130
5860 IF INKEY=575 THEN GOTO 130
5870 IF INKEY=576 THEN GOTO 130
5880 IF INKEY=577 THEN GOTO 130
5890 IF INKEY=578 THEN GOTO 130
5900 IF INKEY=579 THEN GOTO 130
5910 IF INKEY=580 THEN GOTO 130
5920 IF INKEY=581 THEN GOTO 130
5930 IF INKEY=582 THEN GOTO 130
5940 IF INKEY=583 THEN GOTO 130
5950 IF INKEY=584 THEN GOTO 130
5960 IF INKEY=585 THEN GOTO 130
5970 IF INKEY=586 THEN GOTO 130
5
```


First-rate

Hardware *Ferguson TX Portable Colour Monitor Television* **Price** £229.95 **Supplier** Thorn EMI Ferguson, Cambridge House, Great Cambridge Road, Enfield, Middx.

After peering closely at my TV screen for some time to read the script on *Tasword* or having to bring home a heavy monitor to use the school BBC B at home, I decided to give the new Ferguson TX with RGB a trial.

Before using the Spectrum with the set I needed to fit a video output adapter then make up a suitable lead. Adapt Electronics sell a suitable adapter with clear instructions.

Ten minutes to solder up a lead between phono and a 240 degree din plug (the connections are shown on the back of the TV), switch on and plug in with fingers crossed.

Voila! With a click the screen lights up with a clear image and no background noise (the volume may be left set for TV usage, sound is muted automatically). Trying *Border*, *Paper* and *Ink* on various settings revealed that the colours were clear and bright. The image is generally much sharper than normal.

I tried the new monitor out on a few games. *Jetset Willy* jumps and marches through the sparkling halls of his mansion with a crispness not seen before. On to *Valhalla* and after a little fiddle with the variable capacitors C1, C2, the small figures are sharp and steady and bottles and rings are recognisable. The only fault being green, blue and yellow which when mixed as in the trees still scintillate; well we can't have everything. I shall be reluctant to take this set back to the shop.

Using *Tasword* with a blue paper, white text and magenta border to define the right hand margin clearly, I found I could read text from two yards away.

Trying it now with the BBC, the composite video output only provides a grey scale

picture although admittedly with good resolution and a small border. So back to the bench and make up a RGB lead — a little more tricky this one and Ferguson do list one as an optional extra. Life would be easier if one had been in stock.

However, plug everything in and try **W.*, up comes *Wordwise* nice and clear. The top line of Editing mode was half out of sight so escape to menu and type **TV255* to lower the display, it was much improved. Load a text file, the acid test being what a page of text looks like in preview 80 column mode, *Mode 0/3*. The result was most pleasing, a clearer image than the standard issue M...V... monitor at school. The resolution must be good.

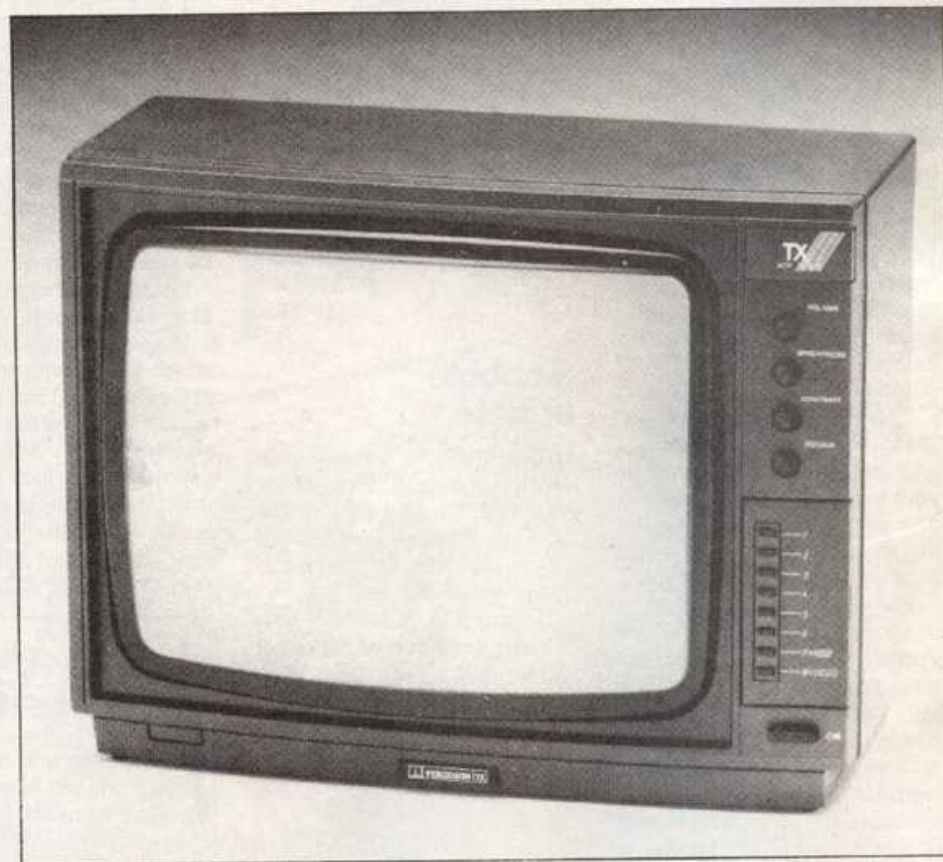
I next tried a graphics program that draws in *Mode 0*. A large circle has a slight distortion towards the top but that's being

nit-picking. Lines are finely drawn. Only the brightness control on the TV affects the screen image, colour and contrast have no effect unlike when using the composite video input from the Spectrum. In fact, after chaining through a few programs from disc, the colours and screen display, as might be expected from RGB input, cannot be faulted.

Leaving both computers running, the only adjustment needed when switching between RGB and video is to turn the brightness down for RGB and up for video or TV.

In conclusion the Ferguson TX RGB a first rate performance and will not be going back to the shop tomorrow. Anyone want to buy a two year old 14inch colour portable?

David Cole



Essential item

Hardware *Spectrum Video Adapter* **Price** £3.45 **Supplier** Adapt Electronics, 20 Starling Close, Buckhurst Hill, Essex.

This small item is an essential for any person wishing to connect their ZX Spectrum to a monitor that requires a composite video signal.

The adapter arrives in a small poly-bag with an A4 sheet of instructions and two small pieces of insulation tape (1cm square).

It consists of a short length of wire with a Phono socket at one end and two clips attached to red and yellow wires at the other. It is neatly finished.

The step by step fitting instructions are clear and rightly stress the need to take care when opening up your Spectrum to make the necessary connections. No soldering is required. Diagrams are included for issue 2 and issue 3 Spectrums. Fitting takes less than five minutes if you include looking for your screwdriver. The new socket is left hanging out of the back of the Spectrum case next to the EAR socket. A little untidy, I was able to improve the fitting with more space available in my Fuller Keyboard case.

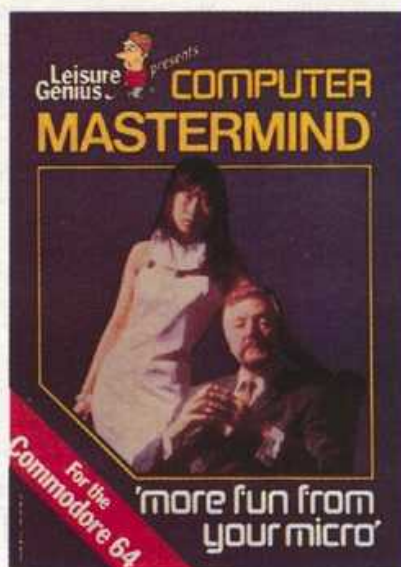
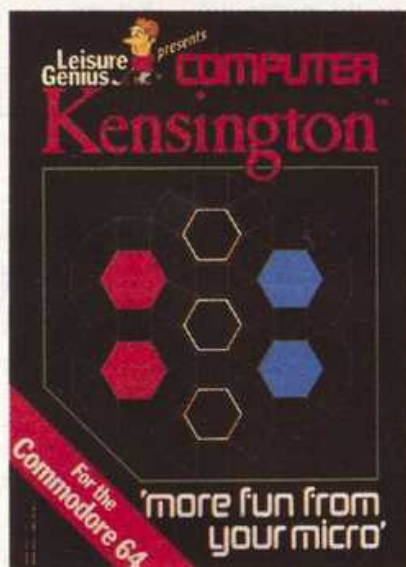
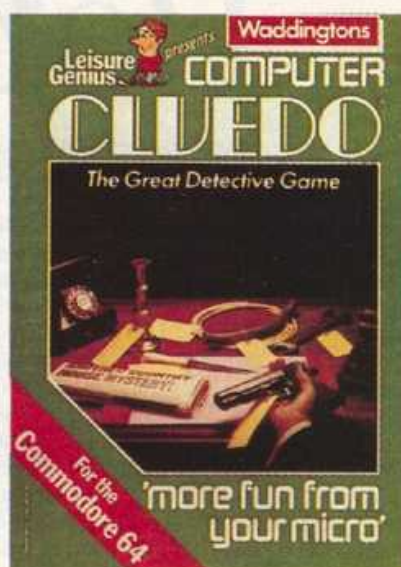
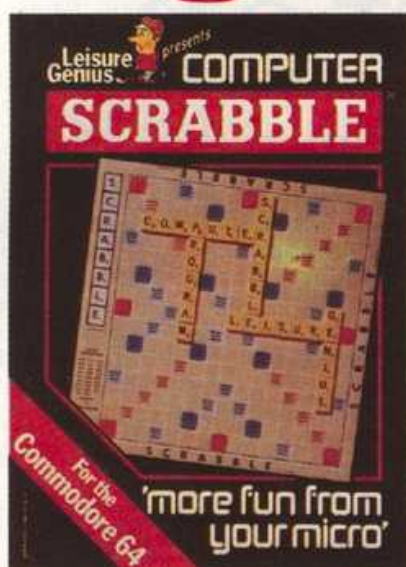
If the monitor has a TV type socket then

you may connect up with the standard Spectrum lead, but connecting to the monitor will require another lead for the composite video input. These are available from Adapt Electronics (£3.50 — £4.00).

We first tried the adapter with a BBC 12 inch green-screen monitor *Tasword's* 64 character screen could be zoomed to fill the monitor screen and the clarity was improved by *Pokeing the Paper* and *Ink* colours to black and white respectively (instructions to do this are available from *Tasword*). The resulting display was professional, and after two hours of letter writing and file manipulating with masterfile, eye strain was definitely reduced. A useful purchase.

David Cole

Ingenious...



Computer games for people who hate computer games.

Give your joystick a rest, and your brain a chance with these family favourites.

Software by...

Leisure Genius



3 Montagu Row, London W1H 1AB

NOW AVAILABLE AT



WHSMITH

AND AT OTHER LEADING STORES.

SCRABBLE® trade mark and copyright licensed by Scrabble Schutzrechte und Handels GmbH (a J. W. Spear & Sons PLC associated company).
CLUEDO® trade mark and copyright licensed by Waddingtons Games Ltd. MASTERMIND® trade mark and copyright licensed by Invicta Plastics Ltd.
KENSINGTON™ trade mark and copyright licensed by Whale Toys Ltd. LEISURE GENIUS® is a registered trade mark of Winchester Holdings Ltd.

Porter

It was never like this at the Hilton in Porter on the Spectrum 48K by Stephen Fisk

Few two-player games in which both players are active at the same time have been designed for the Spectrum (with one or two notable exceptions), despite their advantage of generating greater variety. In any game played against the computer the strategy of the machine, however complex, is of course predetermined and will gradually be learnt by the player. Against human opposition, on the other hand, a player will meet a wide range of different strategies. Different opponents will tend to play in, say, an aggressive or defensive fashion, and even a single opponent can be expected to use different strategies at different times.

In *Porter* each player controls a porter who can attempt to shoot the other porter

and also has the task of carrying suitcases from one side of the screen to the other. The suitcases for the blue porter start on the left and have to be carried across to the right; and vice versa for the red porter. In order to pick up a suitcase the porter must be located directly above it.

Each player in the game has three lives, and the game ends when one player has lost all three lives. The winner is the player with the higher score at that moment.

You shoot in the direction in which you are facing, and shots have a limited range. If you hit a porter who is carrying a suitcase, the suitcase as well as the porter will disappear. For this reason, if you expect to be shot it is often wise to drop any suitcase immediately; it will at least be possible for

the succeeding porter to retrieve it.

Hitting the opponent scores three points, shooting, but missing is minus one point. Dropping a suitcase after carrying it across the screen scores the number of points displayed on the suitcase.

The controls are as follows:

	Blue	Red
Up	3	8
Down	S	J
Right	E	I
Left	W	U
Pick up	Z	Symbol shift
Drop	X	M
Fire	C	N




```

10 PAPER 7: INK 0: BORDER 5: CLS
20 GO SUB 4000
90 BEEP .4,20: BEEP .6,15
100 REM Move
102 LET hit=0
105 LET a1=IN 63486: LET a2=IN 64510: LET a3=IN 65022: LET b1=IN 61438: LET b2=
IN 57342: LET b3=IN 49150
110 LET a=x(1)+(a3=253)-(a1=251)
115 LET b=y(1)+(a2=251)-(a2=253)
140 IF SCREEN$(a,b)<>" " AND NOT (a3=253 AND c(1)) THEN GO TO 210
142 IF SCREEN$(a,b)<>" " AND a3=253 AND c(1) AND a2<>255 THEN GO TO 210
145 IF NOT c(1) THEN GO TO 185
150 IF SCREEN$(a+1,b)<>" " AND (a1<>251 OR a1=251 AND a2<>255) THEN GO TO 210
160 LET d$=SCREEN$(x(1)+1,y(1))
185 LET b$(1)=CHR$(145-(a1=251 AND a2=255)+(a3=253 AND a2=255)+2*(a2=253))
190 PRINT AT x(1),y(1):" ";AT x(1)+1,y(1):" " AND c(1)): LET x(1)=a: LET y(1)=
b: PRINT INK 1:AT x(1),y(1):b$(1)
200 IF c(1) THEN PRINT PAPER VAL d$: INK 9:AT x(1)+1,y(1):d$
210 LET a=x(2)+(b3=247)-(b1=251)
215 LET b=y(2)+(b2=251)-(b2=247)
240 IF SCREEN$(a,b)<>" " AND NOT (b3=247 AND c(2)) THEN GO TO 300
242 IF SCREEN$(a,b)<>" " AND b3=247 AND c(2) AND b2<>255 THEN GO TO 3000
245 IF NOT c(2) THEN GO TO 285
250 IF SCREEN$(a+1,b)<>" " AND (b1<>251 OR b1=251 AND b2<>255) THEN GO TO 300
260 LET d$=SCREEN$(x(2)+1,y(2))
285 LET b$(2)=CHR$(145-(b1=251 AND b2=255)+(b3=247 AND b2=255)+2*(b2=247))
290 PRINT AT x(2),y(2):" ";AT x(2)+1,y(2):" " AND c(2)): LET x(2)=a: LET y(2)=
b: PRINT INK 2:AT x(2),y(2):b$(2)
295 IF c(2) THEN PRINT PAPER VAL d$: BRIGHT 1: INK 9:AT x(2)+1,y(2):d$
300 REM Pick/drop
310 LET p(1)=IN 65278: LET p(2)=IN 32766
315 FOR n=1 TO 2
320 IF p(n)<>253 AND p(n)<>251 THEN GO TO 380
330 LET s$=SCREEN$(x(n)+1,y(n)): IF s$<"1" OR s$>"5" THEN GO TO 380
335 IF n<>1+INT (ATTR (x(n)+1,y(n))/64) THEN GO TO 380
340 LET c(n)=p(n)=253
350 IF c(n) OR y(n)<>1+29*(n=1) THEN GO TO 380
355 LET t(n)=t(n)+VAL s$
360 PRINT BRIGHT 1: INK n:AT 21,16*(n=2)+7;t(n)
370 FOR r=50 TO 30 STEP -1: BEEP .008,r: NEXT r: PRINT AT x(n)+1,y(n):" "
380 NEXT n
400 REM Shoot
405 LET sh=1
408 LET n=INT (RND*2)+1
410 IF p(n)<>247 THEN GO TO 600
415 LET a=x(n): LET b=y(n)
420 LET z=CODE b$(n): LET c=(z=146)-(z=144): LET d=(z=145)-(z=147)
430 FOR m=1 TO 5: LET a=a+c: LET b=b+d
440 IF SCREEN$(a,b)<>" " THEN GO TO 500
450 PRINT AT a,b:"*": PAUSE 3: PRINT CHR$ 8;" "
460 NEXT m
500 IF ATTR (a,b)=59-n THEN GO TO 550
510 BEEP .4,-30: BEEP .6,-42: LET t(n)=t(n)-1
540 GO TO 590
550 FOR c=1 TO 4: BEEP .1,24: BEEP .1,28: BEEP .1,31: BEEP .1,36: NEXT c
555 FOR z=1 TO 10: PRINT AT a,b:"#": PAUSE 3: PRINT CHR$ 8;" ": NEXT z
560 LET z=1+(n=1)
565 IF c(z) THEN PRINT AT x(z)+1,y(z):" "
570 LET l(z)=l(z)-1
572 LET t(n)=t(n)+3
575 LET hit=1
575 PRINT INVERSE 1:AT 21,(31-2*1(2) AND z=2)+(2*1(1) AND z=1):"#": LET c(z)=0
: LET x(z)=1: LET y(z)=13+5*(z=2)
580 IF NOT l(z) THEN GO TO 3500
585 PRINT INK z:AT x(z),y(z):CHR$ 144
590 PRINT BRIGHT 1: INK n:AT 21,16*(n=2)+7;t(n)
600 IF hit THEN GO TO 3000
610 LET n=2-(n=2): LET sh=sh+1: IF sh=2 THEN GO TO 3000
620 GO TO 410
3000 GO TO 100
3500 REM End
510 LET e$="": FOR n=8 TO 12: PRINT BRIGHT 1:AT n,8:e$: NEXT n
520 PRINT INVERSE 1:AT 9,10:"FINAL SCORE"
530 PRINT BRIGHT 1: INK 1:AT 11,10:" ";t(1): INK 2:AT 11,16:" ";t(2)
5999 PAUSE 0: RUN
4000 REM UDG
4010 FOR n=USR "a" TO USR "d"+7: POKE n,-1: NEXT n
4020 POKE USR "a"+1,231: POKE USR "a"+2,231: POKE USR "c"+5,231: POKE USR "c"+6,
231
4030 POKE USR "b"+3,249: POKE USR "b"+4,249: POKE USR "d"+3,159: POKE USR "d"+4,
159
5000 REM Init/Display
5010 DIM l(2): LET l(1)=3: LET l(2)=3: DIM c(2)
5020 DIM t(2): LET t(1)=50: LET t(2)=50: DIM x(2): DIM y(2): LET x(1)=1: LET y(1)
=13: LET x(2)=1: LET y(2)=18
5030 DIM p(2)
5040 LET b$=""
5100 FOR n=0 TO 31: PRINT INVERSE 1:AT 0,n:"#":AT 21,n:"#": IF n<21 THEN PRIN
T INVERSE 1:AT n,0:"#":AT n,31:"#"
5110 NEXT n
5200 FOR n=1 TO 2: PRINT INK n:AT x(n),y(n):b$(n): NEXT n
5210 PRINT BRIGHT 1: INK 1:AT 21,2:"*":AT 21,4:"*":AT 21,7:"50": INK 2:AT 21,23
:"50":AT 21,27:"*":AT 21,29:"*"
5220 FOR n=1 TO 5: PRINT PAPER n: INK 9:AT 3*n+1,1;n: BRIGHT 1:AT 3*n+1,30;n: N
EXT n
5999 RETURN

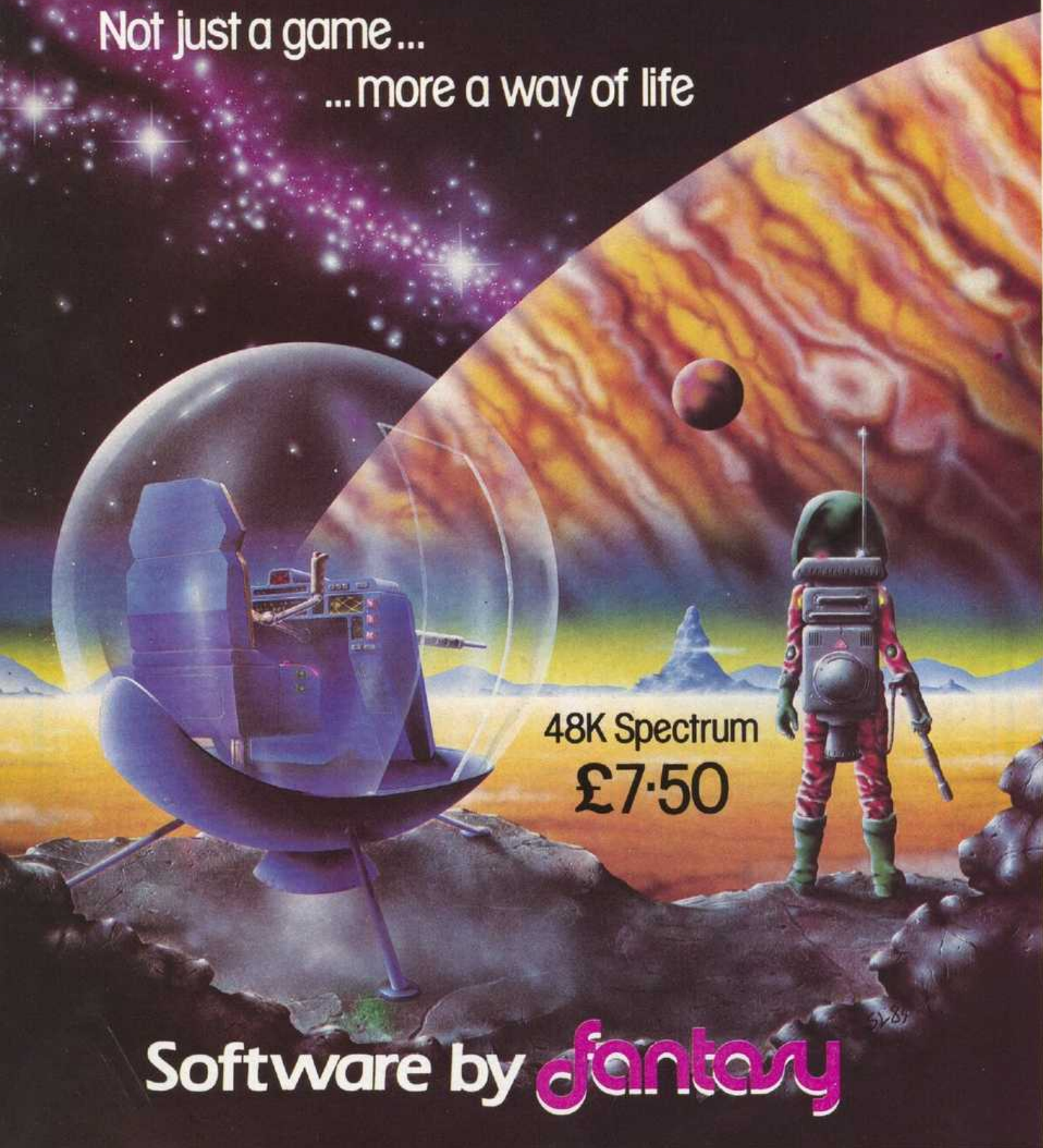
```


BACKPACKERS

GUIDE TO THE UNIVERSE PART 1

Not just a game...

...more a way of life



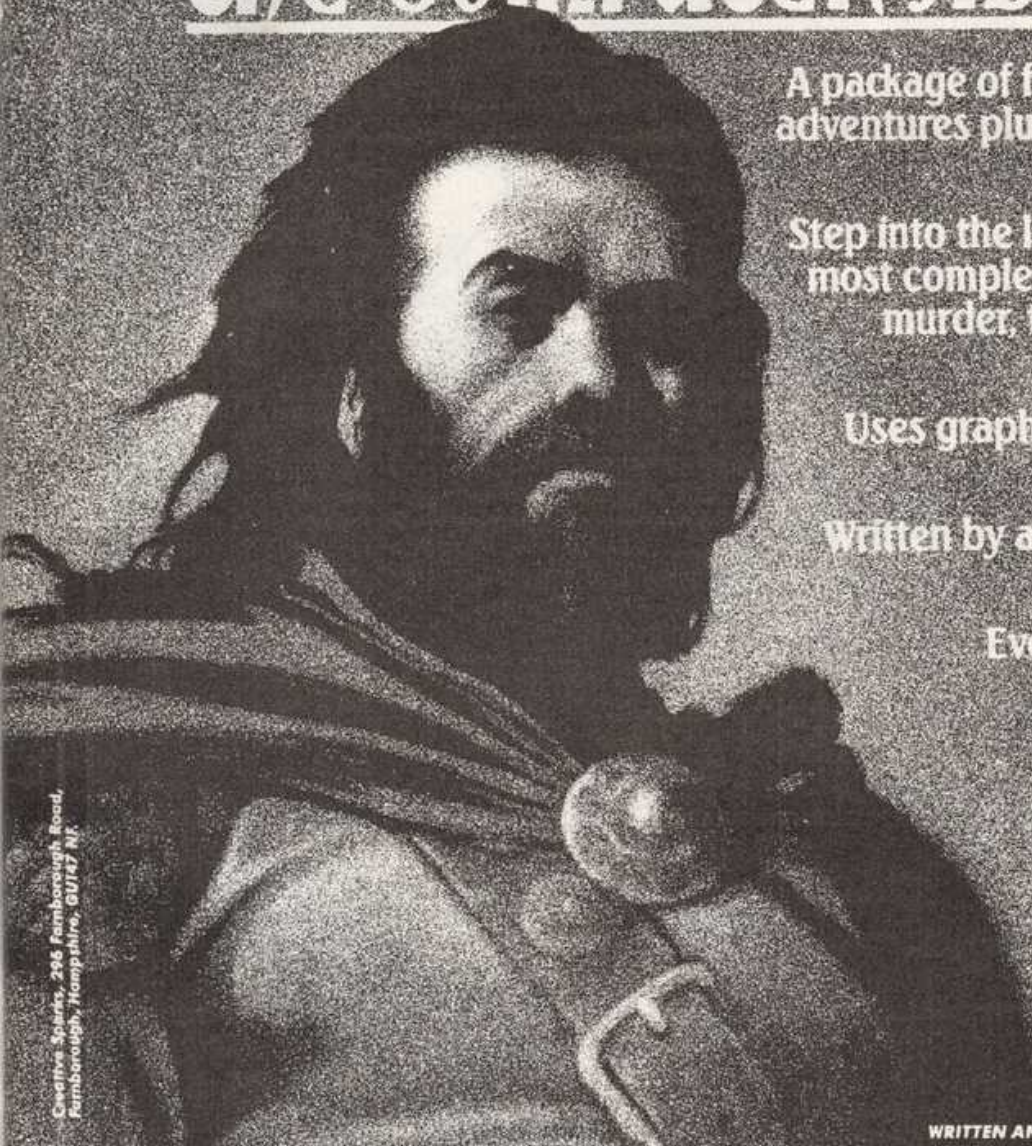
48K Spectrum

£7.50

Software by **fantasy**

MACBETH

THE COMPUTER ADVENTURE



A package of four completely different adventures plus four character analysis programs.

Step into the leading role in one of the most complex and intriguing webs of murder, treachery and witchcraft ever conceived.

Uses graphics as an integral part of the problem solving.

Written by a highly qualified team of experts.

Even the most experienced adventurers will find something new and challenging.

Let your computer stretch your imagination.

FOR COMMODORE 64
£14.95

WRITTEN AND DESIGNED BY OXFORD DIGITAL ENTERPRISES

CREATIVE SPARKS

Available from

All good computer software stockists.

Send me (tick as required)

- ☐ My local stockist's address
☐ Your full list of games
☐ _____ copy/ies of this game

TNEE 293 at £14.95 each £ : p
 + single P&P sum : 30p
 Total to send £ : p

Method of payment

By cheque or PO (no cash) made payable to **TECS**



- ☐ By Access or
☐ Barclaycard

Enter card no.

Sign below:

Credit card sales: UK buyers only.
 Response within 21 days.

Creative Sparks,
 Department MO,
 296 Farnborough Road,
 Farnborough, Hampshire, GU14 7NF.
 Telephone: (0252) 518364.

Name _____

Address _____

PCW 1184

Voices in the wilderness

Christina Erskine walks in The Jungle and tramples through MUD... all without getting her feet wet

Alan Carmichael, head of Compunet Teleservices, reckons Compunet is one of the first truly interactive databases.

What he means by this is that on Compunet there is plenty of scope for talking to other Compunet users, whether through the user's software 'market', The Jungle, or playing Multi User Dungeon with up to 100 others.

I went to talk to Alan, and Graham Craigie, general manager of Compunet Teleservices, at the company's newly acquired premises in the centre of London.

Compunet was originally set up as a joint venture between Commodore and ADP Network Services, to provide a network database specifically for Commodore 64 owners. Both Alan and Graham were formerly at ADP, and involved with Compunet's development from the very beginning.

"ADP decided on a major strategy review earlier this year, saying it would only continue investment in three areas — and Compunet wasn't one of them!" explained Alan. "Graham and myself left the company to form Reactive Technology, and carry on the commitment to develop the system."

"While ADP still supplies the network itself which Compunet runs on, it is no longer involved in ownership. Compunet is now a separate company owned jointly by Commodore and Reactive Technology."

The interaction between users particularly convinced Alan and Graham that Compunet was viable. "We felt, and still do feel, that people don't just want to retrieve information from the big databases. We wanted 64 owners to be able to participate more. They should be largely deciding what goes into it."

Hence The Jungle, a section of Compunet, where, says Alan, "users are pretty much allowed to do what they want". The Jungle gives members the facility to up- or down-load software, insert small ads — the most interesting small ad I saw was a QL for sale — leave messages — as on a bulletin board — and write comments, complimentary or otherwise, about software on offer from other Jungle users. While on other sections of the network, a fixed price is charged by Compunet for taking advantage of the facilities, in the Jungle, software providers can charge their own price for their efforts.

"Obviously, with something uncontrolled like this, some people may abuse the system and users are free to make complaints. If we come across anything really dreadful, like piracy or obscenity, then we can cut off someone's account."

Compunet is designed to be as inexpen-

sive as possible for the user. The first year's subscription is free, and membership arrives automatically with the purchase of the Commodore Communications Modem at £99.95. "What has actually happened is that Commodore is paying us the £30 for each person which is the yearly subscription. Calling up Compunet during off-peak phone times — after 6pm and all weekend — is also free, apart from the British Telecom phone charge of course. Users will only have to start paying Compunet when using the facilities — there is no charge for just flicking through the pages and seeing what's on offer."

Subscribers to Compunet have an account opened for them. Every time they "buy" anything, the cost is automatically recorded and the subscriber is billed accordingly.

The *Edit* facility, which comes as part of the modem software enables pages to be compiled while off-line, before being input into Compunet on-line, this saves money and it also allows the user to store pages on-line, and then browse through them at leisure later, off-line.

Using Compunet has been made as easy as possible too with a 'duck shoot' style menu permanently travelling along the bottom of the screen, containing all the necessary commands: "Up-load", "down-load", "buy" and so on.

How many Commodore owners are going to get deeply involved in using Compunet? Neither Prestel nor Micronet have attracted as many subscribers as originally hoped (Micronet has only around 15,000 subscribers).

"I think networking is set for a big boost in the next year," said Alan. "We do feel it is going to appeal to a fairly small regular user base, but with the modems themselves, a price barrier has now been broken. Three months or so ago, modems were costing £160 to £170. Ours, at just under £100, comes with all the software necessary to plug in and get going straightaway."

"Initially, we think Compunet will appeal to the keen enthusiasts, the buffs and hackers. That will account for our first 5-6000 users. But after that, as it develops, we want the network to provide interest to the whole family."

At the moment, Compunet is still in the process of developing and finalising many of the services available. Currently up and running is Commodore's own Vicsoft library of education programs in the section entitled *The Study* — most of which are free to down-load.

"There are about 60 different programs available at the moment covering subjects



from Maths to Health Education," said Alan. "We're planning to add about ten new titles each month to the list. The library of educational programs is a prized possession of Commodore's — it was put together in Canada in the days when the Pet was the leading education machine, and a lot of the programs have since been converted for the 64."

A more controlled — and controllable — version of The Jungle, Software Park, is administered by Compunet. This section comprises commercial programs, which cost money for the user to down-load. Mr Micro is just one of the companies which has sent programs to Compunet to be sold in this way.

Most of the programs in Software Park are protected, in that the user's modem number is encoded into the program when it down-loads.

Then there is Compucat, Compunet's resident journalist, keeping all users abreast of events in a highly personal, chatty style.

Also on the go, is MUD, the Multi User Dungeon — at present the showpiece of Compunet. This Dungeons and Dragons style adventure was set up and developed largely by Richard Bartle for students at Essex University. Its implementation on Compunet is the first time a true multi-user adventure has been easily available to the public. "It seems to be taking off quite well, too," said Graham. "I logged in about three days after it was first available, and already there were six others in the game."

"There's lots more to come on the system," said Alan. "The home banking service will be announced this month — this



Ian Carmichael (right) and Graham Craigie of Compunet Teleservices

will be very much consumer orientated, with advice on how to get loans, what sort of insurance people need and so on.

"The idea is to introduce something new each month. For instance, next month a computer magazine — no, I can't tell you which one — is going to become available on Compunet as well as appearing conventionally in print."

The estate agency service, vaunted in Compunet's pre-publicity releases, is on Compunet, but not yet available to public users, though it will be within the next few months.

"National Property Link do a computer networking service for estate agents and offered to do this via Compunet. At the moment it is marketing direct to the agents, but it will be thrown open to the public in the not-too-distant future."

Also, tucked away in a corner of Compunet is an interesting page, which gives explicit instructions for accessing Prestel through the Commodore modem.

Isn't this a somewhat self-defeating exercise? "Not at all. If people want to access Prestel, then they're going to find out how to access Prestel, whether we tell them how or not. Several Compunet users have accounts with both networks, anyway, so I don't see that we should see them as rivals. "Compunet's better."

FAST LOADERS

COMMODORE 64

TAPE TO DISK



R.B.S.

A NEW GENERATION conversion utility, developed from the acclaimed Hypersave-64, R.B.S. converts virtually all your long loading cassette programs to TURBO-LOAD, faster than the CBM disk drive. Multi-part and autorun programs are handled with ease. Converted programs load independently. No additional hardware, no pokes, no SYS calls, no user knowledge required. Load "The Hobbit" in 120 seconds. Tornado, Lightning load, Fastback now obsolete. R.B.S. will convert more programs than any competing utility. Cassette £7.50p.

HYPERSAVE-64

Retaining the flexibility which the programmer demands. Hypersave leaves you in control. 8 additional Basic commands. Save, load, verify up to 48K continuous Ram at HYPERSPEED with full error checking. Converted programs reload independently. Autorun facility. Hypersave also allows a small number of fast loading programs to be converted to Hyperload. Reviewed in Your 64 issue 2. Cassette £7.50p.

FREE WITH EVERY ORDER:
SECRETS! A GUIDE TO CASSETTE I/O CONTAINING
PREVIOUSLY UNPUBLISHED SECRET
INFORMATION. FAST DESPATCH GUARANTEED.
CHEQUE/P.O. OR SAE TO:

DOSOFT
2 Oakmoor Avenue
Blackpool FY2 0EE

DISKUS I

Introducing the new market leader. This is the simplest to use and most efficient tape to disk transfer utility yet devised. No program rewriting is required and transferred programs will automatically run when loaded.

- ★ For single, multi, and autorun programs
- ★ Automatic filename handling
- ★ Efficient use of Disk space
- ★ No user knowledge required

Diskus 1 will handle several program types which other utilities ignore, including headerless files. A bonus program is included which will transfer a number of fast loading programs to disk. Cassette £9.99p.

PRO-SPRITE

Library, Editor, Animator for single and multicolour sprites. Joystick control. Packed with features. Menu driven. 100% machine code. Complete with your first sprite library. Cassette £7.50p.

DISKUS I IS £9.99 SPECIAL DISCOUNT:
ANY TWO OF THE REMAINDER JUST £9.99P.
ALL THREE ONLY £15.00P.
ALL PROGRAMS SUPPLIED WITH FULL
INSTRUCTIONS AND MAY BE TRANSFERRED TO
DISK.

Me? Who?

Program *Know Your Own Personality Micro* Spectrum 48K **Price** £9.95 **Supplier** Mirrorsoft, Holborn Circus, London EC1

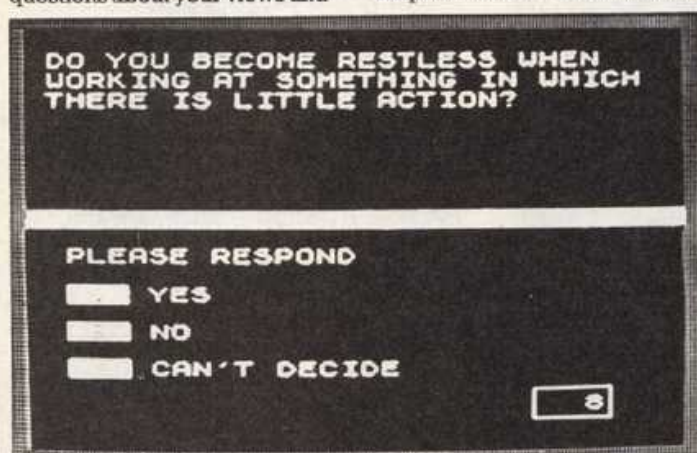
Dear Clare — Nobody likes me. Even my Spectrum crashes when I approach. What should I do? — Worried.

Dear Worried — Could it be that you have a personality problem? In this case I have a computer program, based on a best selling paperback by Professor Hans Eysenk and Dr questions about your views and

behaviour — 630 to be exact, divided into three groups, so it all takes time and there's lots of data reading. Then, in less time than it takes to spell psychoanalysis, it produces a bar chart and written comments that define your characteristics.

But, Worried, you ask me if this is scientifically sound. The accompanying booklet makes certain initial high sounding claims, but lest you worry too much when you find it says that you should be locked away, I would suggest that there are too many variables involved.

An unusual addition to any self-seeking Habitat household. — but when you really need help the micro will never re-



Glenn Wilson, to help you 'know yourself'.

It asks you multiple choice

place us agony aunts.

John Minson



Also ran

Program *Sports Hero Micro* Spectrum 48K **Price** £6.95 **Supplier** Melbourne House, Castleyard House, Castleyard, Richmond, Surrey

Somebody ought to tell Melbourne House that the Olympics have finished — *Sports Hero* is so obviously a game released a few months late. If you've played *Athlete*, then you will find little new in *Sports Hero*. There are good animated graphics and smooth running action as you attempt to qualify for the finals of the four events: 100 metre sprint,



110 metre hurdles, long jump and pole vault. Unfortunately, the finals never happened, so the best you can do is 'qualify'. The blurb on the cassette box is all too honest, 'Here's your chance to be part of a winning team.' As in *Track & Field*, you achieve speed by pressing two keys in quick succession: the faster you press, the quicker the athlete runs.

The hurdles and pole vault are quite difficult — it's hard to judge when to make the jump to clear the hurdles and the pole is easy to break, with dire consequences, when vaulting. There are three levels of difficulty, each with its own detailed background graphics.

Different, and certainly appealing to armchair athletes, but I don't think the AAA will be too worried just yet.

Simon Springett



Pot shot

Program *Potty Pigeon Micro* Spectrum 48K **Price** £8.95 **Supplier** Gremlin Graphics, Alpha House, 10 Carver Street, Sheffield

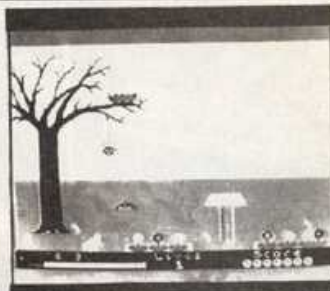
What are pigeons best known for? That's right — gathering worms to feed their young. That's your mission as Percy, the *Potty Pigeon*.

Your air space is as crowded as fog-bound Heathrow though, and the worms appear in the most inconvenient places, such as roads, so it's easy to become a late pigeon.

Now what else are pigeons known for? Laying eggs... at least I think they're eggs! Whatever, they serve as bombs to dispose of your opponents.

So long as you remember to rest your wings regularly you are ready to fly the world's first pigeon flight simulator.

Like many multi-screen



games this requires careful timing and fast reactions. Perhaps less strategy than usual is called for, but at least Gremlin have disposed of the platform element that is so common nowadays. In fact, *Potty Pigeon* is a joy graphically, humorously and is smoothly animated and highly detailed.

Sad to report that the keyboard control is not good, owing to an odd selection of keys and a joystick is necessary. I also wonder about its lasting addictiveness — it lacks the puzzles of arcade adventures.

John Minson



Take two

Program *Wrath of Magma Micro* Spectrum 48K **Price** £12.50 **Supplier** Mastervision, Park Lorne, 111 Park Road, London NW8

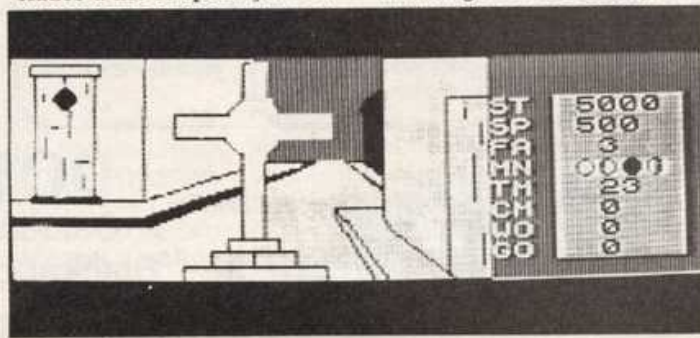
Wrath of Magma is the third of the Third Continent series of games, originally released by Carnell Software, and now put out in an improved, speeded-up form by Mastervision under the Mastervision label.

The price may seem steep, but it's well worth it — you get three games, detailed instructions, and a 158 page tome, *The Book of Shadows*, which gives you the history behind the adventure game's plot, and includes a list of spells you can

use, and monsters you may meet.

The objective of the game is to rescue the Elfin Princess Edora, and kill the evil witch Magma.

The first episode is set in a village, and is text and graphics. The screen display includes a picture of each location, a status display indicating your strength, both physical and spiritual, your combat ability, the time, the phase of the moon (important in spell casting) and so on. The lower part of the screen is used for text instructions, and command entry. This episode follows fairly standard adventure format, with a few deviations. Items present in a location will only be listed a command — and even then, some things which can be 'got' will not be there. You have to guess where certain things can be found, and



proceed on the assumption that you are right. In the wood, for example, you will not be told that deadly nightshade is growing, but you can still pick it up.

Most of the items collected in Episode 1 are spell components which you need in Episodes 2 and 3.

These latter two sections are presented in a slightly different format from Episode 1; instead of a graphic depiction of your present location, you see a map of the maze of caves or castle rooms you are moving through. The screen display is otherwise the same.

Bust-up

Program *Ghostbusters Micro* Commodore 64 **Price** £10.99 **Supplier** Activision, 15 Harley House, Marylebone Road, Regents Park, London NW1.

In general, spin-offs tend to be rather second-rate products riding on the back of some other success.

So, it was with great trepidation that I loaded *Ghostbusters*, thinking back to the very funny movie I saw earlier this month.

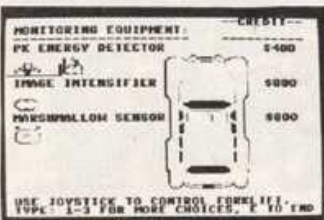
The film itself (not yet released in this country) is amazing... so why have Activision launched the game now, instead of waiting for the buzz that the film is certain to cause?

Somewhere in the distance, coincidentally, some radio began to play the *Ghostbusters* hit theme. Catchy little tune. I did a double take; the sound was coming from my Commodore! Synchronised with the music, the words were being displayed, together with a little bouncing white ball to tell me what to sing. I was invited to press the space bar. "Ghostbusters!" it cried. Wow! Feet

Magra can be a little slow, and the repetition of 'I don't understand' gets very wearing, but — these minor complaints aside — it is a very challenging package.

Mastertronic should be thanked by all adventure fans for rescuing it from the wreck of Carnell Software. They also rescued Stuart Galloway and Roy Carnell, who created the Third Continent series and we should be seeing some interesting packages coming from Mastervision over the next few months.

Martin Croft



tapping, I started to play the game.

It is a 10% business, 10% strategy, 80% arcade game. In a starting sequence you are given \$10,000 with which you buy your ghostbusting equipment. Then the fun starts. There are three main sequences. The city map display shows you where there is a psychic disturbance, and you trace a path there from your current position. You are then shown — in plan view — on a three-lane highway *en route* to catch roaming ghosts.

When you reach your destination you have a view of a building (again very well done) with a ghost (or slimer) whizzing around outside. You drop your trap and position your crew so the slimer is confined above the trap, then fire. "Ghostbusters!" the machine shouts... if you are successful

(you also get some money for doing this), otherwise one of your team is zapped and complains, "He slimed me!"

The speech synthesis is very good indeed. All this is done to that theme tune which far from becoming monotonous is really very catchy.

Why the early release? Because *Ghostbusters* the game

is really just as good as the film. It isn't the most testing arcade game in the world, neither is it the most original, but what David Crane has produced is a game that is incredibly good fun to play and is faithful to the spirit of the film.

John Cook



Useful

Program *BBC Micro Utilities* **Price** £6.95 **Micro** BBC B **Supplier** Shiva Software, 64 Welsh Row, Nantwich, Cheshire

Bruce Smith has produced a number of books on assembly language programming on the BBC micro.

Now this cassette offers *Beemon*, a useful monitor program, and 17 of the longer machine-code routines from his book *BBC Micro Assembly Language* which is available separately from Shiva at £7.95.

Beemon allows you to study sections of the Beeb's memory. From its opening menu a disassembler option translates machine-code into the friendlier assembler form and even shows the ASCII characters concerned where appropriate. The monitor option lets you see memory and register contents and even allows you to modify

these directly. (It sensibly prevents direct modification of the stack pointer which could cause chaos!) The *Step* option lets you go line by line through a machine-code program and *Dump* lets you study sections of memory on screen or on a printer.

Two further menu options are *Memmove* to shift code from one place to another, though you should avoid &E00 to &41FF where *Beemon* itself resides; and *Fill* which lets you fill a specified area of memory with various characters. Finally, the program lets you access the Beeb's cassette interface so that you can *Save* and *Load* blocks of code.

The monitor program is useful enough but for the regular assembly coder the series of routines which follow may save a lot of typing time.

A useful and sensibly priced package.

Dave and Jan Watterson



Role-play

Program *The Secret River — Adventure One in the Runemagic Series* **Price** £7.95 **Micro** BBC B **Supplier** Triffid Software Research, Cullwood Lane, Ashley, New Milton, Hants

This game is tailor-made for Dungeons and Dragons fans. Here is an adventure that responds to the character playing it — and the outcome will change depending on the strengths and weaknesses of that character.

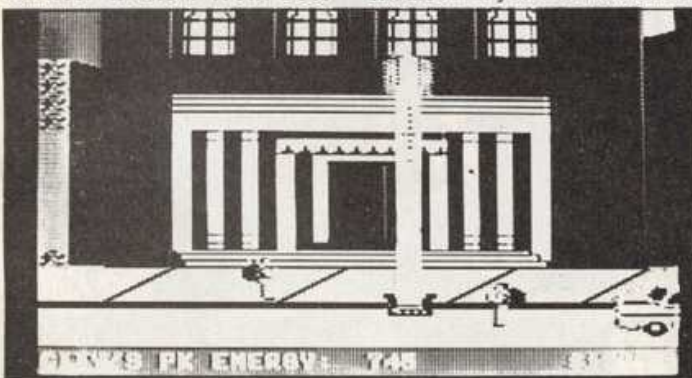
The first step in playing the game is to load a character generator program. This assigns a set of attributes and an amount of money to your persona. The money can be used to buy weapons, spells and armour. Here a certain amount

of skill must be applied in the choices you make.

The game is a fantasy story where the object is to locate and drink from a magical green river which is guarded by trolls. The usual tasks are presented — finding and using various objects on the journey; fighting and casting spells. However, the outcome of fights and dangers will be affected by the skills and weaponry of your character; and his or her luck will also vary.

When you have succeeded you can save your character's newly developed skills and talents, put them through the character generator again and start afresh with a higher level of spending and abilities.

Dave and Jan Watterson





Dan the Man

Program *Hot Shoe* **Micro** MSX
Price £5.95 **Supplier** Eclipse
Software, Longman House,
Burnt Mill, Harlow, Essex.

Early in the working life of any new micro it is difficult to be particularly critical about the games released for it.

It does take time for programmers to learn the strengths and weaknesses of a system, and tailor games to suit.

So when I say that *Hot Shoe* is one of the best MSX games I have seen so far, don't get too excited about it.

You are Dan the Atomiser Man who, as usual, is charged with the task of saving the Universe — this time from an exploding Reactor.

In the first screen, you manoeuvre your spaceship left-right across the bottom of the screen, avoiding on-coming asteroids (yawn). Crashing into one will drain your energy, which you will need in the next

screen.

Having negotiated the asteroid belt and reached the reactor, you are beamed into the reactor core itself... a 3-D grid of coloured discs. These discs are numbered 1 to 6 and are counting up, towards 7. At this stage they flash and become permanently red, that is critical. If all the discs (all right then, reactor cores) reach this terminal state, the Universe explodes and the game is over.

You stop this from happening by jumping from disc to disc... every time you land on a 'core' its number is reduced by one. On reaching zero, they turn green. Stray 'atoms' hinder you in this task by jumping around the grid, draining your energy on contact. You need this energy for jumping around the grid, zapping atoms and on higher levels, deterring a robotic adversary.

Okay then, *Hot Shoe* isn't going to persuade anyone to swap their Spectrum for an MSX, but for first time buyers it should prove entertaining.

John Cook



any more intelligent, nor Lestrade any less obtuse. Nor does the Commodore seem immensely impressed when Sherlock makes some brilliant deductions, such as the fact that he's never going to reach King's Cross at all unless he remembers to get out of the hansom cab first.

Melbourne House's 'English' allows for some fairly sophisticated input, and simple graphics and reams of text scroll up smartly as required. However, because the game is played in 'real time', you need to get all the relevant movements more or less word perfect in order to turn up at the right places on time.

The game plays slightly differently each time as well, just to throw you off-beam when you decide to have one more go.

Melbourne House claims the vocabulary enables you to 'interrogate the suspects' and 'discuss the case' — so far I have to admit my interrogation is limited to "Tell me your alibi". Lestrade tells me not to be silly when I attempt a reasonable discussion, and Watson keeps

getting lost (last seen heading south down Leatherhead High Street).

The whole thing is maddeningly frustrating. I suspect it could well have stumped the real Holmes.

Personally, I reckon Major Percival Ffoulkes did it, but then so does Lestrade, and he never got it right in the books.

Christina Erskine



Frustrating

Program *Underwulde* **Micro** Spectrum 48K **Price** £9.95 **Supplier** Ultimate-Play-the-Game, The Green, Ashby de la Zouch, Leicestershire

Underwulde is everything you expect from an Ultimate game. Technically excellent, with an ingeniously imaginative and well implemented game concept that is fiendishly difficult.

So why do I find playing the game so annoying? Not challenging... just a pain.

The game itself starts with your nicely animated persona in a multi-levelled complex of caves, connected by natural shafts and chimneys. You move around by jumping and to travel up you can hitch a lift on passing bubbles of volcanic gas. Your task... deliberately vague... is to locate and take some weapons scattered around the complex (an axe, a sword and a bow, I think) then go on to fight the 'devil in his lair'. I can promise you, this is not going to be easy. You are constantly attacked by various well designed floating nasties

who don't kill you... they just push you around (although this itself can be fatal if you are pushed off the bubble of volcanic gas you are travelling up a shaft on, and consequently plummet down four levels to your doom).

This is what I found so infuriating. I can take being shot to bits in *Elite*. I don't mind being dissipated in *Tir Na Nog*. But you try being pushed around for the best part of the evening and see if you like it.

If you have a weapon you can kill them off easily enough, but still more come on, nudging you off ledges and generally getting in the way. I'm a pretty even tempered bloke, but the Spectrum came that close to being thrown out the window. Let me promise you — *Knight Lore* is a lot more relaxing.

Having said that, it's big — *Underwulde* has at least 250 locations by my reckoning — a lot of people are going to buy it, and quite right too.

And it's going to be a bumper New Year for Spectrum repairers.

John Cook

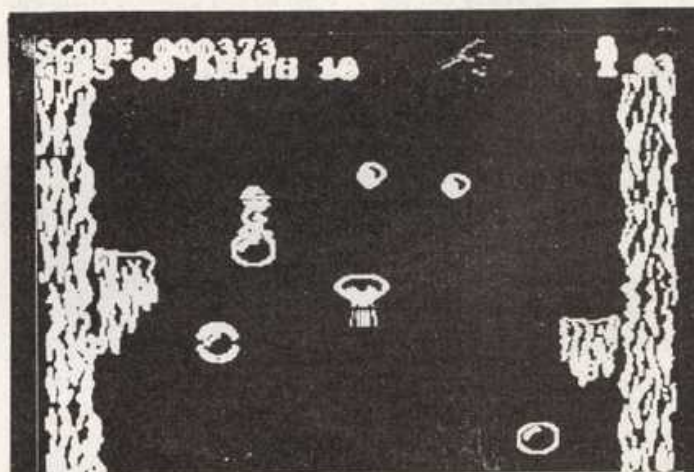


Mystery

Program *Sherlock* **Micro** Commodore 64 **Price** £14.95 **Supplier** Melbourne House, Castle House, Castle Yard, Richmond.

"Well, Watson, I wonder what you make of the curious business of Mrs Brown and Mrs Jones. The case has some interesting points to it, although our public transport system seems unnecessarily complicated these days."

Sherlock has now reached the 64, though the conversion certainly hasn't made Watson



5 WINNING CLASSICS FROM

MICROMEGA

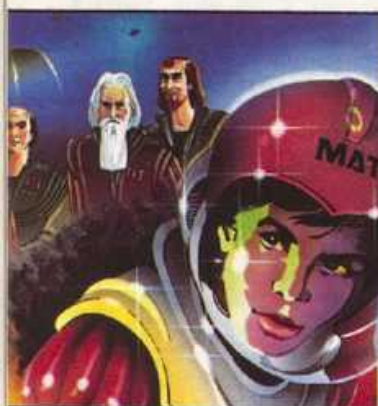


BRAXX BLUFF

Our ultimate 3D program — the multi-screen mission to save the dying crawler crew trapped at Braxx Bluff. Undock and land, walk in search of the crawler, drive it through the marsh, the ruins and the desert — one track wrong and you are dead! — skim the rocky seas at top speed... the natives are after your energy, but caution costs time and the crew are dying. There never was a cockpit-view mission like the one to Braxx Bluff!

Full Throttle places you on the saddle of a 500cc Grand Prix motorcycle. You can choose to race on any of ten of the world's top racing circuits. As a newcomer, you are started at the back of the grid in a field of 40 bikes. You have the best bike in the race, but that alone will not help you!

FULL THROTTLE



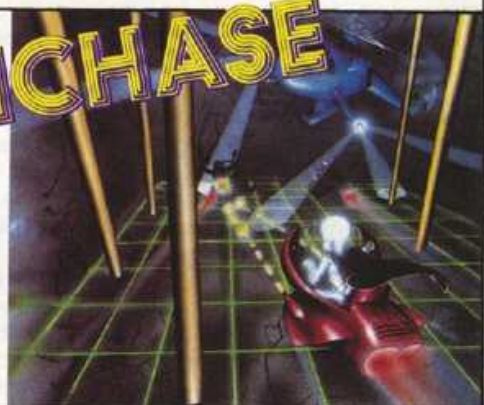
Codename

MAT

MAT is mankind's last hope! The desperate plan to place in the mind of a teenager the combined tactical skills of all the planetary leaders in the solar system. Now your mind is MAT's mind. Take control of the USS Centurion Battle Cruiser and Tactical Command Centre to control the planetary defence fleets against the Myon attacks in MISSION: ALIEN TERMINATION.

3D as you have never seen before on your Spectrum! £6.95 will put you right on the saddle of the Big Bike! Ride deep into the forest through day and night, chasing the enemy riders.

DEATHCHASE



Weave through the trees at breakneck speed and watch out for helicopters and tanks — the greatest prizes of all!



Kentilla

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, vanquished aggressors might be your protector. In perilous places of dark, death and pain. Of devious problems and magical task, 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

AT £6.95
EACH
FOR THE
SPECTRUM

Selected titles
available through
larger branches of



spectrum

WOOLWORTH

JUST RELEASED

JASPER

For the 48K Spectrum the most amazing arcade adventure yet with 22 screens of stunning cartoon animated graphics seeing is believing

Beyond Basic

Adam Denning takes a look at three new language packages for the Sinclair QL

Various software companies seem to be working overtime to back up Sinclair's assertion that the QL is a serious machine. There are now a number of assemblers, a BCPL compiler, a Pascal compiler and a Lisp interpreter with promises of a full ISO Pascal and Lattice C to come.

Pascal from Computer One. Computer One, Science Parts, Milton Road, Cambridge CB4 4BH. Price £39.95.

The first language package for the QL — apart from SuperBasic was a Pascal compiler from Computer One. This package costs £39.95 and comes on a microdrive cartridge complete with a respectably long manual. It is not a true compiler as the time-honoured system of compiling into a compact code which is then interpreted at run time is used. This code occupies far less space than the corresponding true 68000 machine code, but it is of course slower.

The Pascal package must be seen as a system in its own right rather than as a development environment as the compiled programs cannot be run outside of the package. The Pascal program is started by the normal auto-boot process and this saves some resident procedure space to put a procedure called simply *Pascal* into. Invoking this procedure from SuperBasic — by typing its name and pressing *Enter* — loads the whole Pascal system from microdrive and enters the command state.

This stage is represented by a menu with eight options, from source editing to file deletion. The operation most likely to be undertaken first is the compilation of the example programs given. These range from the *Towers of Hanoi* problem to a microdrive back-up utility, using decidedly non-standard Pascal to access the QDOS trap routines. To be accepted by the compiler each source file must be terminated with *-pas* and the object code produced is given the *-qip* extension, standing for 'QL Pascal'.

All the examples compile, of course, but only the back-up utility can be described as useful. The compilation process is rather slow, perhaps because the compiler is itself written in Pascal and therefore has to be interpreted. Whatever, the resultant code is immediately executable simply by selecting the *Run* option and typing in the filename in response to the prompt. This highlights one of the more useful aspects of the system: as the compiler and the rest of the Pascal system has to reside in *mdv1* it is assumed that the source and resultant object will be on *mdv2*, so the system

This would make the machine capable of supporting almost as many languages as the BBC micro, and also make it a much more viable proposition to other software houses who have previously been waiting in the wings, wondering whether the QL is going to be worth supporting or not.

defaults to that drive. This means that to compile a program called, say, *mdv2-testprog-pas*, one has to type only *testprog* for the compiler to find the file and act on it. Running the program follows the same principle.

The editor is invoked from menu option 1 and will accept any form of filename, so it could be used to edit almost anything. However, it is in by no means the most ideal form being only a very basic screen editor which does not have repetitive or block commands. It does have two virtues, though. Starting a new line will cause the cursor to be positioned directly under the first character on the previous line, thus giving a degree of automatic indentation. More usefully, if a Pascal program is compiled with errors, these errors are introduced into the source file at appropriate points. Subsequent editing of this file makes debugging a much simpler process, as the errors themselves cannot be edited out but are removed by the compiler when they are no longer a true representation of the error.

The language itself is an extremely odd version of Pascal, with many standard features and an awful lot of non-standard ones. The code is by no means portable — no other system could support the added features, yet almost every program written will want to take advantage of them. The ability to get as close to machine code as this system allows is great for the budding systems programmer, but the whole object is defeated when it is remembered that no program can run on its own — in other words the programs always have to be executed in the Computer One Pascal environment. If a commercial software house were to develop programs using this package it would find it impossible to distribute the product as there would have to be an assumption that every user has a Computer One Pascal compiler!

So, one's whole understanding of why one should purchase a Pascal compiler is turned upside down by this Computer One product — it is great for learning the language and writing utilities for individual use on the QL, but as a product development system it doesn't enter the running. If Computer One could be persuaded to distribute the interpreter and run-times

separately then this situation could change.

The short example of the language in action (see listing 1) simulates a procedure to read in a decimal number from the current input device. The program is an example of how programs written in BCPL might be converted to Pascal. From the same example given later in BCPL it is easy to see not many people would care to simulate it in Pascal...

BCPL from Metacomco, 26 Portland Square, Bristol BS2 8RZ. Price £59.95.

QL BCPL by Metacomco is the most useful language currently available for the QL. It compiles to true 68000 machine-code and is written in such a way that the programs can be run as independent jobs — they will multi-task with whatever is going on elsewhere in the machine.

The system comes supplied with the necessary compiler files, a linker and a

```
PROGRAM Readn;
(* A program to simulate the BCPL READN procedure *)

CONST
(* Declare the character constants for CASE *)
space = ' ';
lf = '\n';
cr = '\r';
tab = '\t';

VAR
sum : INTEGER;
ch : CHAR;
negative, test : BOOLEAN;

BEGIN
sum := 0;
negative := FALSE;
READING;

REPEAT
READ(ch);
test := TRUE;

CASE ch OF
space, lf, cr, tab : test := FALSE;
*: BEGIN
negative := TRUE;
test := FALSE;
END;
*: READ(ch);
END;

UNTIL test;

REPEAT
sum := 10 * sum + (ORD(ch) - ORD('0'));
READ(ch);
UNTIL (ch = '0') OR (ch = '\n');
IF negative THEN sum := -sum;
WRITELN('The value is ', sum);
END;
```

screen editor. This editor is destined to be the most used editor on the QL as almost every product requiring an editor, including those from rival companies, is supplied with it.

BCPL is a very unusual language which has sadly been neglected by the home computer user but which is used extensively in the development of commercial software by many Cambridge based companies. The language is the grandfather of C, now very much in vogue for software development. BCPL still retains its unique flavour though with two major concepts. There are no data types in the language — no integers, floats, reals, booleans or whatever. Everything is represented by the BCPL word, which in this implementation is 32 bits wide. The word can hold any data type, be it a machine address, a number or a

pointer, and consecutive groups of words can be identified as a vector which is the closest BCPL gets to an array. This lack of data types means that the language is unbelievably flexible but it does make the programmer totally responsible for any notional meaning of a word. The idea of a vector is fundamental to the second important BCPL concept—the global vector. This is an area of store devoted to holding such things as the addresses of procedures and functions, the values of variables which may be changed by the whole system and any other data which the programmer wishes to make global.

As the global vector is always at a defined point within the run-time system it is a very simple process to introduce program overlays—section of code which can be loaded during a program run, linked into the global vector and used, then unlinked and removed. Consequently programs which in total would be much larger than the machine Ram available can be compiled and successfully run.

BCPL is also rich in semantic structures, so that the repetition commands include *While...Until*, *Repeat...While* and *Repeat...Until*. All the more popular constructs available in C all have their origins here—the conditional expression, the common *Start* (main in C) procedure and section brackets.

BCPL is very easy to learn and surprisingly easy to read, it is a well thought out mixture of high-level and low-level ideas, so it is ideal for the systems programmer. It has been used to write editors, assemblers, compilers, interpreters and almost anything else you could think of. It has clear input/output handling and the ability to interface machine-code routines with ease—through the global vector.

BCPL for home micros was first seen on the BBC micro, where a highly sophisticated system in Rom can be bought for a rather high price.

The Metacomco QL implementation is very similar and as long as one is aware of the difference in data sizes and channel opening conditions, programs written on one machine will successfully compile and run on the other. QL BCPL lacks a few of the more esoteric procedures supplies with Acornsoft BCPL, but the two packages are similar enough to show the universal nature of BCPL. QL BCPL also includes numerous routines to take advantage of the QL's facilities such as windowing, as well as a set of superior floating-point procedures.

If the Acornsoft implementation seems more comprehensive at first sight this is only because it is supplied as a language Rom intended to supplant Basic, while the QL system is intended to augment QDOS for those programmers who require the facilities available to them from BCPL. The other major difference between the two version is that Acornsoft's BBC BCPL is compiled into a compact interpretive code called Cintcode while the QL compiler produces pure 68000

code. This in turn means that programs written in BCPL on the QL will run on any QL regardless of whether the end user has a compiler or not.

The BBC micro version won't allow this without the purchase of an additional package are written in BCPL using its own consider that all of Metacomco's new QL packages are written in BCPL using its own BCPL program.

The example program of BCPL in operation shows the *ReadN* procedure.

Lisp from Metacomco, 26 Portland Square, Bristol BS2 8RZ. Price £59.95.

QL Lisp is another Metacomco product, again selling at £59.95. Most of the development was carried out by Dr Arthur Norman and JP Fitch, who worked on the Acornsoft Lisp product on the BBC micro and Electron. For this reason QL Lisp is substantially similar to the Acorn product but has the added virtue of being two years younger and therefore rather more versatile.

Nevertheless, anyone considering buying it as a Lisp tutorial aide would be well advised to buy the Acornsoft book *LISP on the BBC micro* by Arthur Norman and Gillian Cattell. Every example in that book which does not use functions specific to the BBC micro will work on the QL implementa-

very difficult to spot!

QL Lisp is supplied on microdrive with numerous examples and a reasonable manual, describing all the built-in functions and variables and explaining how to use the Lisp system. Apart from the multi-tasking capability the similarity to Acornsoft Lisp is obvious, so all your favourite predefined Beeb functions can be transferred across to the QL and used in this new environment.

The major difference between the two Lisp versions is the full turtle graphics package supplied with the QL Lisp, allowing easy graphics routines and the addition of many of the functions which were 'missing' from Acornsoft Lisp, such as *Append*. File handling, although superficially the same, somehow comes across as being more natural on the QL. Preparing a source file with the supplied editor and then using the *Rdf* function to read it in seems the obvious thing to do. Functions such as this make Lisp program development that much easier.

Lisp has been frequently described as the natural language for export systems writing, but its capabilities are by no means limited to that area. The example shows (not necessarily very elegantly) that the language is also capable of the more basic computational requirements. In theory at least, most applications could be written in Lisp. This is unlikely to be a good idea as the interpretation of the code takes some time. When 512K is available for the QL and Metacomco fulfils its promise of a full Cambridge Lisp for the machine, then perhaps Lisp can be used more seriously. As it stands at the moment this system is only really useful as a teaching aid, but at that it performs admirably.

Conclusions

Computer One Pascal: Unless you're desperate, wait for the full ISO Pascal compiler **Metacomco BCPL:** It's my favourite language so I'm a little biased, but the serious programmer would undoubtedly find it a useful purchase

Metacomco Lisp: If you want to learn the language or are capable of thinking up some things to do with it, then this package is probably for you. It's likely to be the best Lisp for the QL until Metacomco brings out its larger version.

```

DEF "fisher"

LET START() BE
  $1 (ENDREAD)
  $2 (SYN := FINDINPUT("con."); SYNOUT := SYNIN
  SELECTINPUT(SYNIN); SELECTOUTPUT(SYNOUT))
  $3 (WRITES("Writeput a number:"))
  $4 (WRITE("Write value is INAN",MY_READN()))
  $5 REPEAT

AND MY_READN() = VALOF
  $1 LET num, ch, negative, flag = 0, 0, FALSE, ?
  $2 (ch := ROCHI)
  $3 (flag := TRUE
  SWITCHON ch INTO
  $4
    CASE '5': CASE '4': CASE '3': CASE '2': CASE '1': flag := FALSE
    CASE '-' : negative := TRUE
    CASE '0' : ch := ROCHI
    CASE '+' : ch := ROCHI
  $5 REPEATUNTIL flag

  WHILE '0' < ch < '9' DO
  $1 sum := sum * 10 + ch - '0'
  $2 ch := ROCHI

  IF negative THEN sum := -sum
  RESULT sum
  $3

```

tion, with the useful bonus that all the techniques and technical details are relevant to both versions.

A Lisp variable is an identifier which could be associated with an atomic value (such as 'A', 'O or 43) or a list, which is an interconnection of atoms and other lists, with the smallest possible list being the () null lists. It is more difficult to describe Lisp succinctly than other programming languages, so perhaps the example listing of a Lisp program shown here helps. It performs essentially the same function as the Pascal and BCPL examples, but the similarity is

```

(*the READN procedure in LISP*)

(defun getnum (ch (sum 0))
  (letq ch (ordinal ch))
  (loop
    (while
      (and
        (greaterp ch 47)
        (lessp ch 58)) sum
      (letq sum (plus (times 10 sum) (difference ch 48)))
      (letq ch (ordinal (getchar))))))

(defun readn ((loop))
  (letq temp (ordinal (getchar)))
  (loop
    (while
      (or
        (eq temp 9) (eq temp 10)
        (eq temp 12) (eq temp 32) (nil))
      (letq temp (ordinal (getchar))))
    (cond
      ((eq temp (ordinal "-")) (minus (getnum (getchar))))
      (t (getnum (character temp))))))

```


DORCAS
SOFTWARE
PRESENT

THE Runes OF Zendos

- High Resolution Graphics
- Full Animation
- Sentence Input
- 12 Separate adventures
- Sound Effects

The tiny principality of DORCASIA was a pleasant fertile land until the wizard ZENDOS used his evil powers to cast the country into perpetual darkness until all citizens pledge obedience to him.

It is known that through the SPELL OF DARKNESS Zendos has trapped the spirit of each month into one of 12 GOLDEN TEMPUS RUNES or RUNIC HOUR GLASSES hidden deep within his mysterious and magical castle.

As the land dies in the grip of the black desolation a hero must be found to locate and destroy the 12 hour glasses thus releasing the months and returning Dorcasia to the natural forces of the seasons.

Each glass has a RUNIC inscription around its base which you must read and understand. Only saying these words will lift that part of the spell. To protect the hour glasses Zendos has placed them in 12 separate rooms in his castle, each room linked to a different exterior gateway by a devious route.

Depending on which entrance you select Zendos casts spells which change the locations of rooms within his castle to confuse you. The menacing creatures and challenging problems which confront you at every turn mean that only the brave and the clever will succeed.



THE ORACLE'S CAVE

**Our best seller available for the
48K SPECTRUM and COMMODORE 64.**

Oracle's Cave is a unique adventure game featuring continuously displayed high resolution graphics and text, a new cave layout and event sequence for every game and a time limit on every adventure.

Available on cassette
from leading retailers
or direct from:

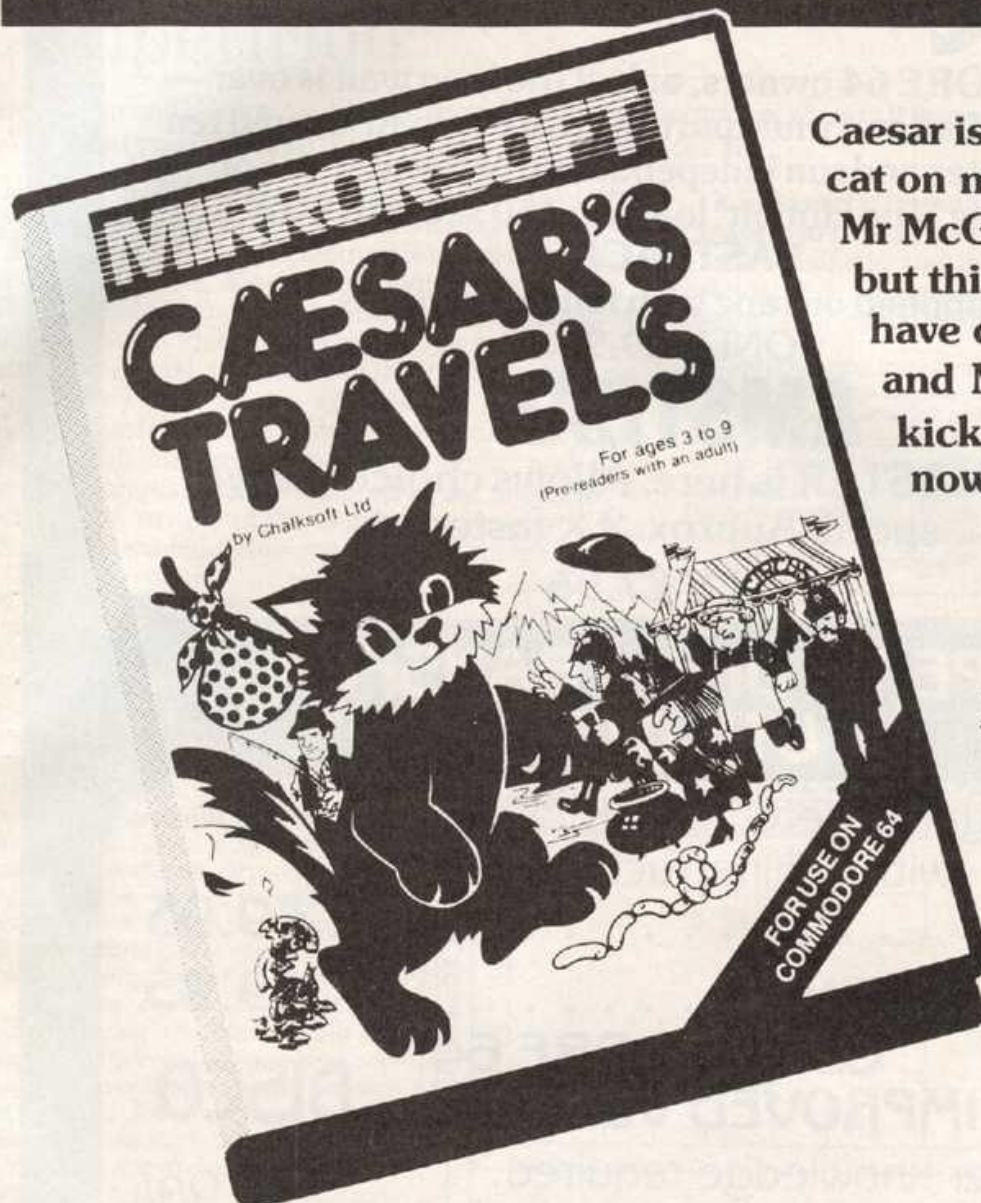
DORCAS SOFTWARE

3 The Oasis, Glenfield,
Leicester LE3 8QS
at £7.95 (inc. VAT)
Postage and Packing FREE

SPECTRUM 48K

COMPATIBLE
WITH
Sirius
ZX
Microdrives

MIRRORSOFT



Caesar is a cheeky young cat on mousing duty in Mr McGregor's larder, but this time the mice have outwitted him and Mr McGregor has kicked him out . . now read on . .

£7.95

Available now on speedy loading cassette for Commodore 64. Coming soon on Spectrum 48K. Recommended for 3 to 8 year-olds

A new concept in early learning software. Caesar's Travels is a unique combination — a complete animated story program on cassette with a 64-page illustrated storybook.

Young readers choose what Caesar does next in an exciting adventure which has multiple endings. Either book or program can be used on its own. Bedtime stories will never be the same again!



SPECIAL OFFER

Also available in a special double cassette pack with the original and widely praised Caesar the Cat arcade game

£9.95

Mirrorsoft programs are available from selected branches of Boots, W H Smith and Spectrum, and all leading software stockists. Or order direct (cheque, Access or Barclaycard) from MIRRORSOFT, FREEPOST, Bromley, Kent BR2 9UX (no stamp needed).

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 × 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**

DISCO

No user knowledge required.

We guarantee this is the best available.

Still only
£9.95



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



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

Games Designer Competition

Design an
arcade Game!

Think you can design an arcade game? This is your chance to put all those great ideas into practice. We want you to design the sequel to Elite's *Kokotoni Wilf*.

Kokotoni Wilf from Elite Software — one of this Autumn's top selling games on both the Commodore 64 and the Spectrum is to have a sequel. The plot? — that's for you to decide!

Popular Computing Weekly offers you the chance to use your own ideas, characters, plot and so on to create the sequel to *Kokotoni Wilf* which will be published by Elite in the new year.

The winner(s) will be credited with the storyline design in all advertising and promotion, and the winner(s) name(s) will be featured in the packaging. In addition, a royalty of 6% of sales achieved will be paid to the winning designer or design team.

It is important to remember that the program you create is to be a sequel and so, in a general way, you should maintain the theme and atmosphere of the original. For anyone not familiar with *Kokotoni Wilf* here is the story so far:

"Legend has it that many hundreds of years ago somewhere in Northern Europe lived a great Magician known as Ulrich. Ulrich knew of a magic amulet, fragments of which had been scattered throughout time. Ulrich wished to wield its power, but he was too old and infirm for such an arduous adventure and so charged his protegee Kokotoni Wilf with the epic task. Ulrich sent Wilf back in time to the age of the great dinosaurs, there to begin his quest through the ages for each fragment of the Amulet. Ulrich has provided Wilf with magic wings and time gates to pass from age to age — your task is to guide Wilf in his epic quest."

What we want you to do

The competition is open to both individual designers or design teams. You are not asked to actually program the game. All you have to do is to prepare a storyboard — a series of screen drawings or sketches — for the sequel which should explain the action from the first screen to the last.

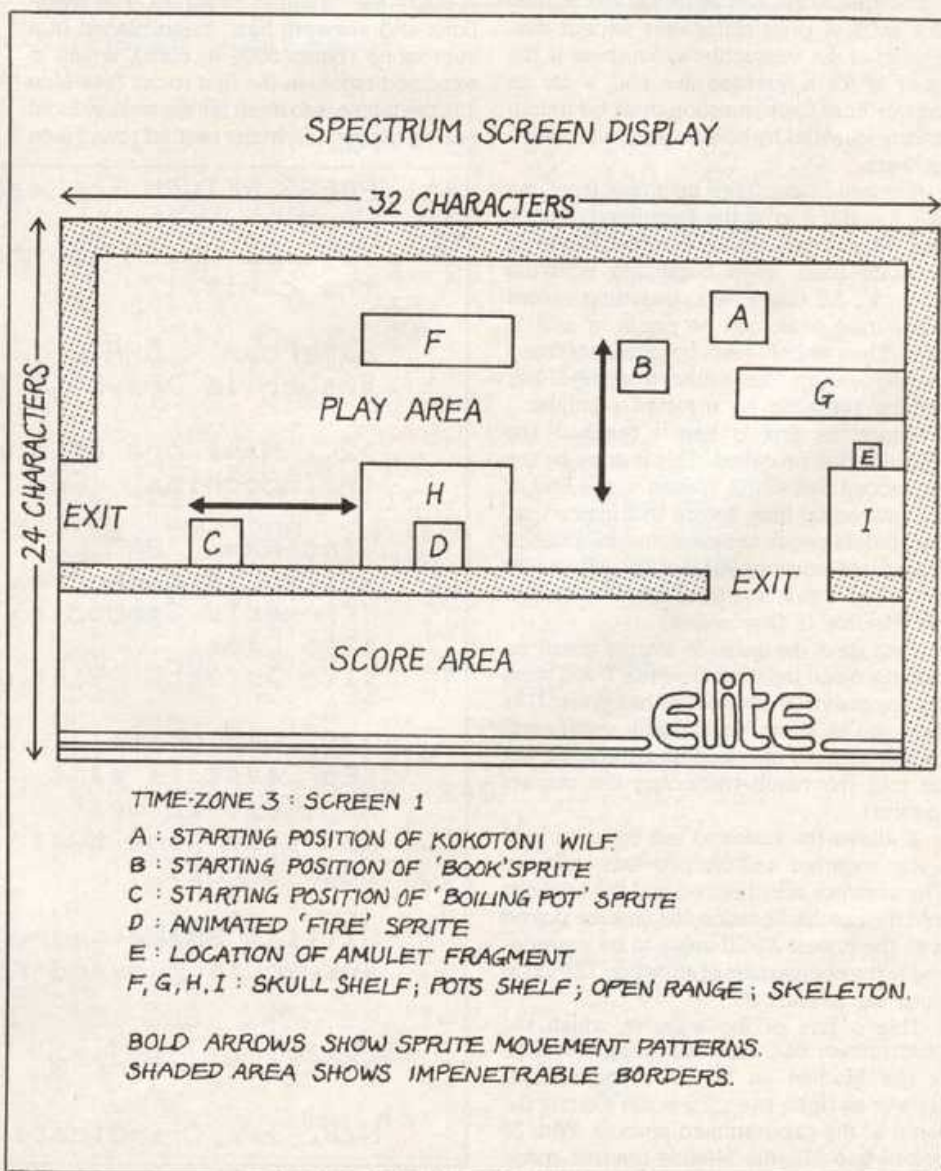
The finished storyboard should be detailed enough for Elite's programmers and designers to use without any major changes — set yourself a limit of no less than 20 screens of action and no more than 60. It might be helpful to divide your storyboard into two sections, a general guide to the story including overall objectives and method of scoring, etc (limit yourself to a maximum of 800 words). The second section should be much more specific detailing exactly what is going on where in each screen, indicating such things as sprites, background layout and movement paths. To help you, we show on the right one such storyboard from a screen in the first *Kokotoni Wilf* program.

How to enter

Completed storylines and storyboards should be submitted to Kokotoni Wilf Competition, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP, to arrive no later than 1 January 1985.

All entrants requiring an acknowledgment of receipt should submit a stamped self-addressed envelope. Entrants requiring their work to be returned after judging should send a suitable post paid self-addressed envelope with the entry.

The judges decision will be final. Don't forget to include your name and address! Ten runners up will receive copies of the game which will be produced for the Spectrum and Commodore 64.



Question time

A testing time for 64 owners with the Question and Answer Module by **Dominick Devlin**

The Question and Answer Module is a ready-made component for an educational program in which a testee is asked a set of questions or can choose between several sets. The user programs the questions with their answers; the Module displays each question on the screen, lets the testee input his answer, checks if it is right and displays the result. Each question is automatically numbered.

The Module, a machine-code routine, can be entered by means of the instructions listed at the end of this article. The educational program should preferably consist of two separate parts, the first part containing the instructions for the Module, followed by instructions to load and run the second part containing the actual questions and answers.

The questions and answers are written like lines of print statements except that, instead of the instruction *Print*, there is the letter 'q' for a question line and 'a' for an answer line. Each question must be immediately followed by its answer or alternative answers.

A question can take up more than one line; just put a 'q' at the beginning of each line. Alternative answers must be placed on separate lines, each beginning with the letter 'a'. All characters, including colour and cursor ones, can be put in 'q' and 'a' lines. The symbol ← will be understood as a carriage return. The symbol from the f7 key will be replaced by inverted commas.

Before the first 'q' line is reached, the Module must be called. This is done by the instruction *Sys 49152*, placed at the end of the preceding line. Before that instruction, the Module needs to have some information poked into locations 251 and 252: 251 should be poked with 0, 1 or 2 (or only 0 or 1 when the Module is first called).

0 will allow the testee to see the questions and input his answers. It will wipe out any previous answers he has given. '1' is the same as '0' except that each answer will be immediately checked, and the testee will be told the result (including the correct answer).

'2' allows the testee to see the questions again, together with his previous answers. The answers are checked and the testee is told the results. Location 252 must be poked with the lowest ASCII value to be considered in the comparison of answers. The value must be at least 35.

This is one of the ways in which the programmer can increase the intelligence of the Module so that it recognizes an answer as right, even if it is not exactly the same as the programmed answer. With 35 poked into 252, the Module ignores space

and colour/cursor keys etc (even when their value is greater than 128), as well as differences between upper and lower case. With *Poke 252,48*, most punctuation signs will also be ignored.

In addition, the programmer can get the Module to accept, for example, both "encyclo-pedia" and "-edia" by putting, in the place of the hyphen, the symbol produced from the f5 function key. I shall come back to the f5 key in a moment.

As soon as the Module reaches a line that does not begin with 'q' or 'a', it exits and the instructions reached are handled as Basic instruction. Two pieces of information are left in locations 253 and 254: Peek (253) for the number of questions answered correctly and Peek (254) for the number of questions asked.

Study the example program. The questions and answers have been placed in a subroutine (Lines 5000 to 6000), which is executed twice. In the first round (see Line 10), the testee is to input his answers without seeing the results. In the second round (see

Line 30), he will see the questions again, together with his answers and the correct answers. In addition to the differences automatically ignored, no account will be taken, for example, of hyphens or brackets.

The testee must be told to press *Return* to see each question (Line 20). After the last question has been reviewed, the final result will be displayed (Line 40). Also shown is what might appear on the screen in the second round.

The answers input by the testee have been marked with 'AAA'. This extra input was not seen by the Module. If the testee's answer corresponds to the programmed answer up to the end of the answer line, or up to the symbol from the f5 key, the Module stops comparing and displays 'answer is right'. The f5 symbol was used in Lines 5040 and 5060 to allow for the French spelling of Cameroon.

To break out of the question and answer routine, insert the symbol "18" in the top left corner of the screen and press *Return*.

The Module itself is perched at the top of the area \$C000 to CFFF (49152 to 53247 in decimals), most of that area being available to hold the testee's answers. The whole of the programming space in the Commodore 64 could thus consist almost entirely of questions and answers. At a rough guess, there should be room for five sets consisting of 100 questions each.

PRESS RETURN for each question

>1<. Of which country is Yaounde the capital?

cameroun AAA
answer is >right<: Cameroon

>2<. Name one of the countries in Indochina

Viet-Nam AAA
answer is KamPuchea
(formerly Cambodia)
also Laos
also >right<: Vietnam

>3<. Who wrote:
"For east is east
And west is west
And never the twain shall meet."
(two words)

William Shakespeare AAA
answer is Rudyard Kipling

MARKS: 2 out of 3

N.B. >...< indicates reverse characters

Example Program

```

1 rem test
5 poke 53272,23:rem upper/lower case
10 poke 251,0:gosub 5000
20 print"PRESS RETURN for each question" CLR
30 poke 251,2:poke 252,46:gosub 5000
40 print"MARKS:";peek (253);"out of";peek (254)
50 end
5000 sys 49152
5030 q"Of which country is Yaounde<the capital?<"
5040 a"Cameroon" f5
5050 q"Name one of the countries<in Indochina<"
5060 a"Kampuchea<(formerly Cambodia)" f5
5061 a"Laos"
5062 a"Vietnam"
5070 q"Who wrote:<For east is east<and west is west" f7
5080 q"and never the twain shall meet.<?<(two words)<" f7
5090 a"Rudyard Kipling" f5
6000 return

```

Main Program

```

10 REM *QUESTION & ANSWER MODULE*
20 FOR P=49152 TO 49461
30 READ D:POKE P,D:NEXT:END
100 DATA 160, 0, 132, 253, 132, 254, 132, 90, 169, 53
110 DATA 133, 93, 169, 193, 133, 96, 133, 94, 140, 47
120 DATA 193, 140, 48, 193, 140, 49, 193, 173, 0, 4
130 DATA 240, 23, 160, 3, 177, 122, 133, 57, 200, 177
140 DATA 122, 133, 58, 200, 177, 122, 201, 65, 240, 125
150 DATA 73, 81, 208, 1, 197, 96, 240, 51, 230, 254
160 DATA 133, 96, 165, 251, 41, 2, 240, 3, 32, 207
170 DATA 255, 162, 2, 189, 47, 193, 41, 15, 56, 233
180 DATA 9, 105, 58, 176, 2, 169, 48, 157, 47, 193
190 DATA 202, 144, 236, 162, 25, 32, 8, 193, 165, 90
200 DATA 24, 101, 93, 144, 2, 230, 94, 133, 93, 160
210 DATA 5, 200, 177, 122, 208, 2, 169, 141, 201, 34
220 DATA 240, 245, 201, 95, 208, 2, 169, 13, 201, 136
230 DATA 208, 2, 169, 34, 32, 210, 255, 201, 141, 208
240 DATA 226, 160, 2, 170, 177, 122, 136, 208, 250, 168
250 DATA 240, 2, 134, 123, 136, 132, 122, 76, 27, 192
260 DATA 32, 207, 255, 145, 93, 200, 201, 13, 208, 246
270 DATA 32, 210, 255, 208, 32, 132, 91, 160, 0, 132
280 DATA 92, 166, 96, 240, 4, 162, 11, 208, 20, 230
290 DATA 96, 165, 251, 41, 2, 240, 219, 177, 93, 32
300 DATA 210, 255, 200, 201, 13, 208, 240, 132, 90, 165
310 DATA 251, 240, 184, 32, 8, 193, 162, 16, 230, 91
320 DATA 164, 91, 177, 122, 240, 30, 201, 135, 240, 26
330 DATA 164, 92, 41, 127, 197, 252, 144, 236, 133, 88
340 DATA 230, 92, 177, 93, 41, 127, 197, 252, 144, 226
350 DATA 197, 88, 240, 220, 208, 5, 32, 8, 193, 230
360 DATA 253, 76, 109, 192, 189, 20, 193, 32, 210, 255
370 DATA 232, 201, 32, 208, 245, 96, 141, 65, 78, 83
380 DATA 87, 69, 82, 160, 73, 83, 32, 65, 76, 83
390 DATA 79, 32, 18, 82, 73, 71, 72, 84, 146, 58
400 DATA 32, 13, 18, 0, 0, 0, 146, 46, 32, 13

```




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, HEMSLEY
GREAT YARMOUTH, NORFOLK NR29 4NQ
Tel: 0493 732420 (24 HR Ansaphone/sales)



No man's land

ORIC/ATMOS

ORIC/ATMOS

OTHER TITLES FOR CBM64/V20 SPECTRUM ZX81 AVAILABLE ON REQUEST



0503 CATEG-ORIC (action game). Take command of a cruiser engaged in battle against fighter planes and submarines. Use the radar and sonar systems to detect and destroy the enemy before you are sunk. £ 7.95



0540 STYX (arcade). Destroy the castles of the Dark One which guard the river Styx. Struggle against vultures, the eyes of the devil and his minions to vanquish evil. £ 8.50



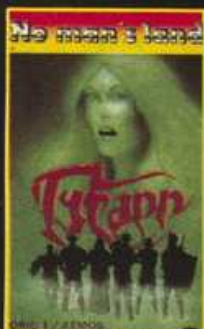
0494 DEBUG (utility). A monitor/debugger to debug your programmes in machine code: position of internal registers, set breakpoints, step through programmes. £ 11.95



0496 OPTIMUM (home). Manage up to 4 different accounts, keep track of expenditure and compare with your monthly or yearly budget. Just what you need to keep the household accounts in order. £ 9.95



0495 FIRE FLASH (arcade). Prevent the aliens from sabotaging the fuel depot and avoid enemy fire by passing into hyper space. An attractive and challenging arcade game in 100% machine code. £ 8.50



0526 TYRANN (adventure). Can you find your way through the labyrinth and liberate Queen Tyrann from her torment? A first-class adventure game with text and graphics. £ 8.95



0514 THE DIABOLICAL TOWER (adventure). The Diabolical Tower has 60 floors, each one fraught with danger. Your mission is to seek out the treasure. £ 8.50



0510 MULTIFILER (business). A powerful programme for creating files. Choose your own criteria adapted to your requirements. Rapid sort and search features in machine code and possibility of memorising over 30000 characters. Extremely simple to use. £ 14.95



0463 PANIC (action). Catch the marauding apples by setting traps. 6 levels. £ 6.95



0515 THE HARE AND THE TORTOISE (education). A game for 3-8 year olds to teach the notions of right, left, up and down and counting. The hare and the tortoise decide to race. Who will win? The level difficulty is adjustable to the child's ability. £ 8.50

OTHER ORIC/ATMOS TITLES

0497 ADDRESS BOOK	£ 9.95
0498 BANK ACCOUNT	£ 12.50
0499 BASIC PLUS	£ 9.95
0502 COMPUTER ASSISTED DESIGN	£ 8.50
0504 CHARACTER GENERATOR	£ 8.50
0465 CONCOURS HIPPIQUE	£ 5.95
0464 CW MORSE	£ 14.95
0506 FINANCIAL CALCULATOR	£ 9.95
0507 INVOICING	£ 14.95
0508 LEARNING FORTH	£ 16.95
0509 LIBRARY CATALOG	£ 9.95
0511 SCREEN KIT	£ 9.95
0513 SUPERCOPY	£ 9.95

RETAILERS CONTACT:

CentreSoft

OR ASK YOUR DISTRIBUTOR TO CONTACT US

DISTRIBUTORS AND OVERSEAS ENQUIRIES CONTACT:

JANET PELTON, INNELEC-NO MAN'S LAND 110 BIS RUE DU GAL LECLERC 93506 PANTIN CEDEX FRANCE TEL.: 33-1-840.24.31.

MAIL ORDER:

POST COUPON TO HIGH TECH UNITS 1 & 2 CONLON DEVELOPMENTS WATFORD LANE DARWEN LANCASHIRE

PRICES INCLUDE POSTAGE AND PACKING FOR UK ONLY OVERSEAS ADD

REF	TITLE	QTY	TOTAL PRICE

PO/CHEQUE ENCLOSED OR DEBIT ACCESS/VISA IF CARD EXPIRY DATE:

IMPORTANT: All cheques or cards payable to NO MAN'S LAND and sent to High

NAME

ADDRESS

POSTCODE

The ZX Spectrum
Expansion System. Only £99.⁹⁵

Sinclair's complete alternative to floppy discs...



**The ZX Spectrum
Expansion System contains:**

- One ZX Microdrive
- One ZX Interface 1
- One wallet containing four programs on Microdrive cartridge
- Microdrive demonstration cartridge
- One blank Microdrive cartridge
- Full documentation
- Connecting lead for Microdrive/Interface 1
- ZX Net Lead

The new ZX Spectrum +

Fully compatible with all Spectrum software and peripherals, including this Expansion System

Tasword Two word processor

Turns your ZX Spectrum into a high-quality word processor!

Tasword Two has all the essential features of professional word processing packages – move and copy, insert, margin settings, 'help' pages, find and replace, and much more.

Written by Tasman Software Ltd.

Usual price (RRP): £13.90.



Games Designer

Now, all you need to create original games are original ideas – and Games Designer! It has eight, very different, pre-programmed games for you to play as they are – or modify out of all recognition!

There's never before been an easier, more enjoyable, way into games design.

Written by Quicksilver Ltd.

Usual price (RRP): £14.95.



Masterfile filing system

Address lists... personal files... stock inventories... stamp or album collections... club records... recipes... if you can file it, you can Masterfile it!

Masterfile is a menu-driven filing and retrieval system of immense power. Display formats are user-defined, so the range of applications is enormous.

Written by Campbell Systems Ltd.

Usual price (RRP): £16.95.



Ant Attack

The all-time classic 3D strategy game. Ant Attack combines stunning Escher-like graphics with fast-moving action and a real tactical challenge.

Your task is to enter the walled city, seek out your captured partner, and escape. At all times you can choose from four angles of view. But beware: the city is patrolled by giant ants...

Written by Quicksilver Ltd. Usual price (RRP): £6.95.



All programs run on a 48K Spectrum or Spectrum+. Recommended retail prices are for each program on cassette.

...includes this great set of Microdrive programs!



The unique ZX Microdrive system sets the Spectrum apart from all other home computers.

It gives you all the advantages of floppy disc drives – at a fraction of the cost. And tests show the Microdrives are faster than some disc drives.

Now, the complete Microdrive system comes in one package – together with four of the best-ever Spectrum programs, on Microdrive cartridges.

This software alone would normally cost you over £50. Yet the Sinclair price for the complete ZX Spectrum Expansion Pack is just £99.95!

You'll find full details of its contents in the panel opposite.

ZX Microdrives – another Sinclair first!

The ZX Microdrive is a revolutionary fast access/mass storage device. And it's the only truly affordable alternative to disc drives...

- Loads or saves up to 85K of program or data from Microdrive cartridges.

- Just 3.5 seconds to access a typical file.
- Only 9 seconds to load a typical 48K program.

The ZX Microdrive cartridge – a unique storage medium.

Smaller than a matchbox, the ZX Microdrive cartridge packs in a massive amount of data and programs.

Each Microdrive cartridge holds at least 85K bytes of data or programs (that's 30 pages of A4 text). And you can store up to 50 different data files per cartridge, identified by titles of your choice.

Every cartridge comes in its own protective case. Simply remove the cartridge, slot it into the Microdrive, and it's ready to use.

ZX Interface 1 – adds powerful new capabilities to your Spectrum.

ZX Interface 1 connects to the back of your Spectrum and controls up to 8 Microdrives. (Additional Microdrives are available for £49.95 each.)

It also gives you:

- An RS 232 interface – to link your Spectrum with full-size printers, other

computers using RS 232 (the industry-standard interface) and provide data transmission over telephone lines, via modems.

- ZX Net – lets you set up a local area network of up to 64 Spectrums, for high-speed data communications between you and Spectrum-owning friends.

At your local Sinclair stockist – today!

The ZX Spectrum Expansion System adds an exciting new dimension to Spectrum and Spectrum+ computing. At £99.95 it's superb value too.

To find out more, call in at your local Sinclair stockist now!

Sinclair Research Ltd,
Camberley (0276) 685311.

© Sinclair, ZX, ZX Spectrum, ZX Microdrive, ZX Net and ZX Interface are Trade Marks of Sinclair Research Ltd.

Sinclair

A L I E N



In space no one can hear you scream.



NAVIGATOR

Shy, Skilful and
Intelligent — Panics Easily.



EXECUTIVE OFFICER

Direct, Imaginative,
Cautious, Loyal.



SCIENCE OFFICER

Secretive, Unlikeable, Brilliant —
Occasionally Illogical.



CAPTAIN

Solid, Dependable, Courageous —
Excellent Leader.



ENGINEERING OFFICER

Physically Strong, Low I.Q.
Potentially Rebellious.



3RD OFFICER

Willful, Ambitious,
Authoritative, Resourceful.



ENGINEERING OFFICER

Cynical, Rebellious,
Untrustworthy, Unflappable.

THE CREW
Personnel
files follow —
yours to
command —
well almost...

MIND GAMES
SPECTRUM 48K · CBM64



Featuring
the unique
Personality Control System

No. 1 Golden Square, London W1R 3AB, Telephone 01-437 0626

£8.99

A swing to the right

The second of three machine-code routines for the Dragon 32 by Roger Walton

This week's article gives Basic listings for machine-code routines which will scroll the PMode 3 screen to the right and upwards. The right scroll routine includes wrap-around but the upwards

scroll does not.

In both cases the full width of the screen is scrolled but the vertical extent of the scrolled screen area may be set by the user. This is done by Poking the two Y-co-

ordinates as shown in the Basic listings 2 and 3. The code is stored at different addresses, so that they can both be used together in a program.

Once the Basic programs have been run, the machine-code can be stored by using the Csave command. An example would be:

Csave "Rscroll",&H7EC2,&H7E5E,&H7EC2

the third address being the Exec address of the routine.

Listing 2

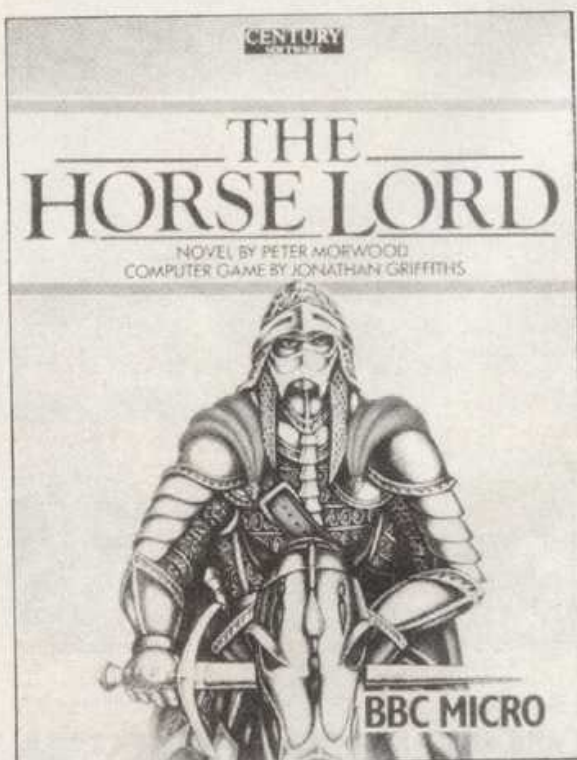
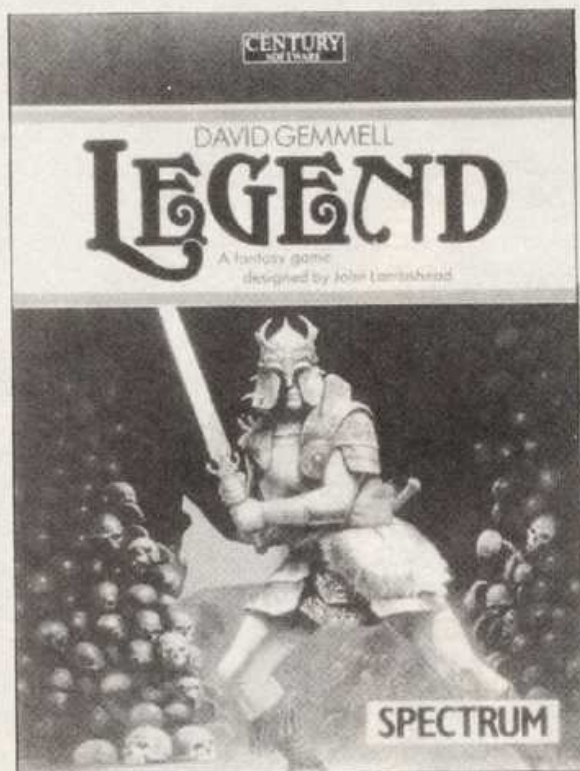
```
100 ' LISTING 2
110'*****
120'SCROLL PROGRAM, R. Walton,
130'*****
140'150 ' This program scrolls
PMode 3 or 4 up the screen
160 '
170 ' The section of the screen
to be scrolled
180 ' is defined by it's lower
and upper Y coordinates which
should
190 ' be POKED into &H7E80 and
&H7E81 before EXECing the
machine code
200 CLEAR 100,&H7E7B
210 FOR LOC=&H7E79 TO &H7EC0
220 READ P$
230 P$="&H"+P$ 240 P=VAL(P$)
250 POKE LOC,P 260 T=T+P
270 NEXT
280 IF T<>7951 THEN CLS:PRINT
"DATA ERROR":STOP
290 CLS:PRINT"DATA LOADED"
300 PRINT"USE EXEC &H7E79
310 PRINT"TO CALL THE SCROLL
320 DATA 16,00,06,06,00,1D,FF,00
330 DATA BF,86,20,F6,7E,80,3D,C3
340 DATA 06,00,FD,7E,7C,86,20,F6
350 DATA 7E,81,3D,C3,06,1F,1F,02
360 DATA 31,A8,E1,10,BF,7E,7E,BE
370 DATA 7E,7C,A6,88,20,A7,80,BC
380 DATA 7E,7E,26,F6,4F,10,BE,7E
390 DATA 7E,31,A8,20,10,BF,7E,7E
400 DATA A7,80,BC,7E,7E,26,F9,39
```

Listing 3

```
100' LISTING 3
110'*****
120' SCROLL PROGRAM, R. Walton
130'*****
140'
```

```
150 ' This program scrolls PMode 3
graphics right
160 ' across the screen, with
wrap-around built in
170 ' The section of the screen
to be scrolled
180 ' is defined by it's X and
Y coordinates which should
190 ' be POKED into &H7EC9 and
&H7ECA before EXECing the machine
code
200 CLEAR 100,&H7EC1
210 FOR LOC=&H7EC2 TO &H7F5E
220 READ P$ 230 P$="&H"+P$
240 P=VAL(P$) 250 T=T+P
260 POKE LOC,P 270 NEXT
280 IF T<>16932 THEN CLS:PRINT
"DATA ERROR":STOP
290 CLS:PRINT"CODE LOADED."
300 PRINT"EXEC &H7EC2 TO"
310 PRINT"CALL RIGHT-SCROLL"
320 STOP
330 DATA 16,00,0B,06,00,1D,FF,00
340 DATA 00,00,00,00,00,00,86,20
350 DATA F6,7E,C9,3D,C3,06,00,FD
360 DATA 7E,C5,86,20,F6,7E,CA,3D
370 DATA C3,06,1F,FD,7E,C7,BE,7E
380 DATA C7,7F,7E,CB,31,88,E1,10
390 DATA BF,7E,CE,7F,7E,CC,A6,84
400 DATA B5,01,26,27,B5,02,26,2E
410 DATA 64,84,64,84,1C,FE,30,1F
420 DATA BC,7E,CE,25,05,17,00,29
430 DATA 20,F2,A6,01,BA,7E,CB,BA
440 DATA 7E,CC,A7,01,BC,7E,C5,22
450 DATA C8,20,39,34,02,86,40,B7
460 DATA 7E,CC,35,02,20,CE,34,02
470 DATA 86,80,B7,7E,CB,35,02,20
480 DATA C7,C6,40,F7,7E,CD,C6,02
490 DATA 1C,FE,64,84,25,0D,34,04
500 DATA C6,80,F7,7E,CD,35,04,5A
510 DATA 26,EE,39,A6,01,BA,7E,CD
520 DATA A7,01,20,EA,39
```


CENTURY
COMMUNICATIONS



LEGEND

This superb role-playing fantasy game will stretch your adventuring skills to the limit. It's based on the bestselling novel *Legend* by David Gemmell and contains not one but two massive games for the 48K Spectrum.

Try it for yourself. Adventuring will never quite be the same again.

The pack contains:

- * **Cassette containing both programs**
- * **The book**
- * **Four-colour poster-size map of the land of Drenan**
- * **Full instructions**

£14.95 ISBN 07126 0602 5
Sinclair 48K Spectrum

STARFINDER

Starfinder gives you all you need to begin astronomy.

- * **Computer program displays star maps for any time, date and place on Earth.**
- * **Unique 'space probe' enables you to identify stars, planets, Halley's Comet, etc.**
- * **Print-out facility for star maps.**
- * **Accompanying book by Heather Couper explains everything from black holes to constellations.**

£12.95 ISBN 0 7126 0571 1
BBC Micro/Electron

SKYLINE ATTACK

Pilot your craft across 9 of the world's greatest cities.

This is one of the fastest, most flicker-free games ever written for the Commodore 64.

- * **Fabulous animated graphics**
- * **18 different types of alien**
- * **Superfast loading**
- * **First program ever to allow you to play another game while it loads!**

£7.95 ISBN 7126 0578 9
Commodore 64

THE HORSE LORD

An entirely original arcade game by Jonathan Griffiths, author of *Snapper*.

You are Aldric the nobleman undertaking a messenger's ride to get to the castle.

You have to survive water jumps, enemy horsemen, footsoldiers and ambushes.

- * **Full mode 2 graphics**
- * **Dual screens**
- * **Full sound effects**
- * **Joystick or keyboard**

£7.95 ISBN 0 7126 0645 9
BBC Micro

ORDER FORM

To: Gill Small, TBS, Church Road, Tiptree, Colchester, Essex CO5 0SR

Please send me the following. *Tick where applicable.*

LEGEND

☐ Software pack £14.95
(inc VAT and post & packing)

STARFINDER

☐ Software pack £12.95
(inc VAT and post & packing)

SKYLINE ATTACK

☐ Cassette £7.95
(inc VAT and post & packing)

HORSE LORD

☐ Cassette £7.95
(inc VAT and post & packing)

I enclose my cheque/postal order for £..... (Cheques should be made payable to Tiptree Book Services Limited)

Please debit by *Visa/Access account number

*delete as appropriate

Account Number

Name

Address

Signed

(Please allow up to 28 days for delivery Subject to availability.)

Completing the file

Continued from last week part two of Microfile by Peter Patton

After running the program you might want to create a new file. After considering what was said last week about the art of file design, select option 1 from the Main Menu.

Answer the prompts as they appear on screen. Firstly, enter the filename for this file, then the number of fields you will require. NB. If you allocate seven fields you must use seven fields, as blank field names are not allowed.

You will be prompted in turn for a field name and a field length for each of the fields. The field name is just a label to allow you to identify the data segments. If you make a mistake don't worry. After entering all the field names and lengths, you will be given the opportunity to amend any section.

Once you are happy that your file structure is as intended, select the Save parameters option and follow the prompts to save the file parameters which you have just created. If you Quit without saving the parameters will be lost.

Entering Data

Select option 2 from the Main Menu then

select option 1 from the second menu. After Loading the parameters for the file, the record layout will be displayed on the screen, and you will get the prompt: *Load Data File (Y or N)*. Answer 'N'. You will then get the prompt: *Begin A New Data File (Y or N)* answer this 'Y'.

You are now ready to begin entering data into your file. If you wish to leave a field blank then simply press *Enter* and you will see that the cursor moves to the start of the next field. Note that you are not allowed to backspace out of the field, or to enter data beyond its preset limit.

Saving Your Data

At the end of a session entering data, it is always advisable to Save the contents of the file. If you were to suffer a power cut before you had Saved the file, it would be lost. From the second menu select option 4 (Return to Main Menu), then from the main menu select option 3 (Save Data File). Follow the prompts and your file will be saved to cassette. If you are using the same cassette for both the file parameters and the data file, do not overwrite the parameters for the file!

Leave a big gap between the end of the parameters and the start of the data file, then label the cassette.

To load an existing data file, follow the procedure for starting a new file outlined above; however, when prompted to Load Data File (Y or N) answer yes. Then follow the prompts to load your file. You may now use options 2 and 3 from the second menu to explore the file. To add new records to the file simply select option 2 from the second menu, and select the '+' to add a record.

Finally, when searching for specific data in your files, you will be allowed to search on a single field of your choice. Such searches are set up in such a way as to find any ambiguous reference, and this can produce results which you may not expect. If for example you were looking for *Pat* to find the name *Paton*, you would also turn up names like *Patterson*, *Patrick*, *Patton*, etc. However, this feature is extremely powerful, and some of its usefulness would be lost if I were to take away its ambiguous aspects.

Using the Program:

Program Menus	
MAIN MENU	SECOND MENU
1 Create a New File	1 Load a New File
2 Run Main Program	2 Browse Through File
3 Save Data File	3 Search File
4 Exit From Program	4 Return to Main Menu

```

1170 ***** Search File *****
1180 FOR t=1 TO y:LOCATE 22,(t+5):PRINT STRING$(VAL(RIGHT$(f$(t),2)),4)
5:NEXT
1190 GOSUB 2310:LOCATE 20,23:PRINT"Search On Field No. ";:l=2:GOSUB 21
50:h=VAL(m)
1200 IF h<1 OR h>y THEN PRINT CHR$(7):GOTO 1180
1210 GOSUB 2310:LOCATE 10,23:PRINT"Enter Data For Search":
1220 LOCATE 22,(h+5):l=VAL(RIGHT$(f$(h),2)):GOSUB 2150:s=m
1230 x=1
1240 IF INSTR(dat(x,h),s)=0 THEN 1280 ELSE GOTO 1290
1250 IF x=j THEN 1260
1260 GOSUB 2310:LOCATE 20,23:PRINT"(Q)uit or (R)e-run Search ";:l=1:80
SUB 2150:m=UPPER$(m)
1270 IF m="Q" THEN 740 ELSE IF m="R" THEN 1180 ELSE PRINT CHR$(7):GOTO
1260
1280 IF x<j THEN x=x+1:GOTO 1240 ELSE IF x>=j THEN 1360
1290 LOCATE 5,4:PRINT x;" "
1300 FOR t=1 TO y:LOCATE 22,(t+5)
1310 PRINT dat(x,t):b=VAL(RIGHT$(f$(t),2)):PRINT SPACE$(b-LEN(dat(x,t)
)):NEXT
1320 GOSUB 2310:LOCATE 10,23:PRINT"(Q)uit or (C)ontinue Search ";:l=1:
GOSUB 2150:m=UPPER$(m)
1330 IF m="Q" THEN 1260
1340 IF m="C" THEN IF x<j THEN GOTO 1280 ELSE IF m="C" THEN GOTO 1360
1350 PRINT CHR$(7):GOTO 1320
1360 GOSUB 2310:LOCATE 20,23:PRINT r;" END OF FILE REACHED ";:CHR$(7)
:FOR w=1 TO 2000:NEXT:GOTO 1260
1370 REM ***** Save Data File *****
1380 IF f1=0 THEN CLS:s="N O T H I N G T O S A V E":GOSUB 2320
:FOR w=1 TO 3000:NEXT:CLS:GOTO 40
1390 CLS:s="S A V E D A T A":GOSUB 2330
1400 w=j
1410 FOR x=1 TO w:IF LEFT$(dat$(x,1),1)="-" THEN j=j-1:NEXT
1420 s="Insert & Rewind Data tape, then press "+REC+" & "+r+"
PLAY "+r:PRINT:PRINT:GOSUB 2330
1430 s="Press "+r+" ENTER "+r+" when ready ":PRINT:PRINT:PRINT TAB(FN
c(t)):s:1=1:GOSUB 2150
1440 ft=0:FOR x=1 TO w:FOR b=1 TO y:ft=ft+LEN(dat(x,b)):NEXT:NEXT-
1450 OPENOUT ""
1460 fil$name
1470 PRINT #9,fil$
1480 PRINT #9,ft
1490 PRINT #9,j
1500 FOR x=1 TO w:FOR b=1 TO y
1510 IF LEFT$(dat(x,1),1)="-" THEN 1530
1520 PRINT #9,dat(x,b)

```

```

1530 NEXT:NEXT
1540 CLOSEOUT
1550 RUN
1560 ***** Load File Parameters *****
1570 CLS:WINDOW #1,5,75,6,20:LOCATE 5,5:PRINT STRING$(70,131):LOCATE 5
,21:PRINT STRING$(70,140)
1580 LOCATE 10,23:PRINT"Insert File Parameters Tape Then Press ";:r;" P
LAY ";:r;" & ";:r;" ENTER ";:r;" ":l=1:GOSUB 2150
1590 GOSUB 2310:LOCATE 10,23:PRINT"L O A D I N G P A R A M E T E R
S"
1600 ON ERROR GOTO 2390
1610 OPENIN:"
1620 INPUT #9,name
1630 INPUT #9,y
1640 DIM f$(y)
1650 FOR x=1 TO y
1660 INPUT #9,f$(x)
1670 NEXT
1680 CLOSEIN:GOSUB 2310
1690 RETURN
1700 CLS:WINDOW #1,5,75,6,20:LOCATE 5,5:PRINT STRING$(70,131):LOCATE 5
,21:PRINT STRING$(70,140)
1710 FOR x=1 TO y:a=STR$(x)
1720 IF LEN(a)=2 THEN a="0"+RIGHT$(a,1) ELSE a=RIGHT$(a,2)
1730 PRINT #1,a:NEXT
1740 FOR x=1 TO y
1750 LOCATE 9,(x+5):PRINT LEFT$(f$(x),10)
1760 LOCATE 20,(x+5):PRINT(" ";STRING$(VAL(RIGHT$(f$(x),2)),45);" "):N
EXT
1770 LOCATE 5,4:PRINT"Active File ";name:LOCATE 50,4:PRINT"Record ###
"
1780 RETURN
1790 LOCATE 5,23:PRINT"Load Data File ( Y or N ) ";:l=1:GOSUB 2150:m=U
PPER$(m)
1800 IF m="N" THEN 1970 ELSE IF m="Y" THEN 1830
1810 PRINT CHR$(7):GOTO 1790
1820 ***** Load Data File *****
1830 GOSUB 2310:LOCATE 10,23:PRINT"Insert Data Tape The Press ";:r;" PL
AY ";:r;" & ";:r;" ENTER ";:r;" ":l=1:GOSUB 2150
1840 GOSUB 2310:LOCATE 10,23:PRINT"L O A D I N G D A T A"
1850 OPENIN:"
1860 INPUT #9,fil$
1870 INPUT #9,ft:GOSUB 2330
1880 IF fil$=name THEN 1900
1890 GOSUB 2310:LOCATE 10,23:PRINT r" DATA & PARAMETER FILE MISMATCH "
:r:FOR x=1 TO 2000:NEXT:CLOSEIN:ERASE dat:GOTO 1830

```



```

1900 INPUT #9,j
1910 FOR x=1 TO j:FOR b=1 TO y
1920 INPUT #9,dat(x,b)
1930 NEXT:NEXT
1940 GOSUB 2310:LOCATE 5,23:PRINT"Please Wait"
1950 CLOSEIN
1960 flg=1:GOTO 740
1970 GOSUB 2310:LOCATE 5,23:PRINT"Do You Wish To Begin A New Data File
(Y or N) ":;1=1:GOSUB 2150:m=UPPER$(m)
1980 IF m="N" THEN ERASE F$:GOTO 740 ELSE IF m="Y" THEN GOSUB 2010:GOT
0 740
1990 PRINT CHR$(7):GOTO 1970
2000 ***** Start A New Data File *****
2010 J=1:ft=0:GOSUB 2330:FOR X=1 TO free
2020 LOCATE 5,2:PRINT"Free Space = ";free;" Records"
2030 LOCATE 57,4:PRINT j;" ":FOR z=1 TO y:LOCATE 22,(z+5):1=VAL(RIGHT
$(ft(z),2)):GOSUB 2150
2040 dat(x,z)=m:NEXT
2050 GOSUB 2310:LOCATE 10,23:PRINT"(Q)uit, (C)ontinue or (A)mend ":;1
=1:GOSUB 2150:m=UPPER$(m)
2060 IF m="Q" THEN flg=1:GOTO 740 ELSE IF m="C" THEN 2080 ELSE IF m="A
" THEN 2100
2070 PRINT CHR$(7):GOTO 2050
2080 FOR b=1 TO y:LOCATE 22,(b+5):PRINT STRING$(VAL(RIGHT$(ft(b),2)),4
5):NEXT
2090 J=J+1:free=free-1:NEXT
2100 GOSUB 2310:LOCATE 20,23:PRINT"Amend Field No. ":;1=2:GOSUB 2150
2110 b=VAL(m):IF b<1 OR b>y THEN PRINT CHR$(7):GOTO 2100
2120 LOCATE 22,(b+5):1=VAL(RIGHT$(ft(b),2)):GOSUB 2150

```

```

2130 dat(x,b)=m:GOTO 2050
2140 ***** Keyboard Input Routine *****
2150 FOR F=1 TO L:PRINT CHR$(45);:NEXT:FOR F=1 TO L:PRINT CHR$(8);:NEX
T:P=1:M=SPACE$(L):PRINT CHR$(24);CHR$(42);CHR$(24);CHR$(8);
2160 I=INKEY$
2170 IF I="" THEN 2160
2180 V=ASC(I)
2190 IF P=1 AND V=127 THEN PRINT CHR$(7);:GOTO 2160
2200 IF P>1 AND V=127 THEN PRINT CHR$(8);CHR$(42);CHR$(8);
2210 IF P>1 AND V=127 THEN P=P-1:MID$(M,P,1)=" ":GOTO 2160
2220 IF V=13 THEN PRINT SPACE$(L+1)-P):M=LEFT$(M,(P-1)):RETURN
2230 IF V=44 THEN PRINT CHR$(7);:V=32:GOTO 2250
2240 IF V>31 AND V<123 THEN GOTO 2250 ELSE PRINT CHR$(7);:GOTO 2160
2250 IF P>L THEN PRINT CHR$(7);:GOTO 2160
2260 MID$(M,P,1)=CHR$(V):PRINT CHR$(V);CHR$(42);CHR$(8);
2270 IF P<(L+1) THEN P=P+1
2280 IF P=(L+1) THEN PRINT " ";CHR$(8);
2290 GOTO 2160
2300 ***** Clear Prompt Line *****
2310 LOCATE 1,23:PRINT d1:RETURN
2320 ***** Print s$ In Centre Of Screen Line *****
2330 PRINT TAB(FNC(T))/5:RETURN
2340 ***** Calculate Number Of Free Records *****
2350 tr=0:FOR x=1 TO y:tr=tr+VAL(RIGHT$(ft(x),2)):NEXT
2360 free=INT((FRE("))-ft)/tr)
2370 IF free>32767 THEN free=5000
2380 DIM dat(free,y):RETURN
2390 IF ERR=10 THEN ERASE f$:RESUME 1640
2400 RESUME NEXT

```

INCENTIVE

1984 and MILLIONAIRE

1984

A GAME OF
GOVERNMENT MANAGEMENT



BBC
MODEL B
& SPECTRUM

1984 - A GAME OF GOVERNMENT MANAGEMENT

'Compulsive'
- Software Today

'Clear, Concise, and Well
Presented'
- Big K

'A very special game'
- PCW



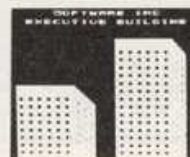
MILLIONAIRE

WATCH YOUR PREMISES
GROW WITH SUCCESS!

'An absorbing program'
- CTW

'Pick of the Week'
- PCW

'Very addictive...'
- HCW



ELECTRON
BBC B
& SPECTRUM

SELECTED ITEMS AVAILABLE FROM LARGER
BRANCHES OF



John Menzies

RETAILERS 1984 and Millionaire are available now from: Microdealer,
Tiger, Centresoft, Express, R & R, Terry Blood, Websters,
Twang, Microdeal and Leisuresoft.

REGISTERED OFFICE 54 London Street, Reading RG1 4SQ.
CREDIT CARD ORDERS Tel. Reading (0734) 591678

ORDER FORM 1984 Spectrum £5.50 | BBC B £6.50 |
MILLIONAIRE Spectrum £5.50 | Electron & BBC B £6.50 |



Please rush me the titles as indicated above by 1st Class post. I enclose
cheque for £..... or debit my credit card

No.

Access
Visa

Name

Address

INCENTIVE SOFTWARE LTD, 54 London Street, Reading RG1 4SQ, England.

POOLSWINNER

THE ULTIMATE POOLS PREDICTION PROGRAM

- **MASSIVE DATABASE** Poolswinner is a sophisticated Pools prediction aid. It comes complete with the largest database available - 22000 matches over 10 years. The database updates automatically as results come in.
- **PREDICTS** Not just SCOREDRAWS, but AWAYS, HOMES and NO SCORES.
- **SUCCESSFUL** SELEC guarantee that Poolswinner performs significantly better than chance.
- **ADAPTABLE** Probabilities are given on every fixture - choose as many selections as you need for your bet. The precise prediction formula can be set by the user - you can develop and test your own unique method.
- **SIMPLE DATA ENTRY** All English and Scottish team names are in the program. Simply type in the reference numbers from the screen. Or use FIXGEN to produce fixture list automatically (see below).
- **DISC/MICRODRIVE COMPATIBLE** All versions (except Apple and IBM) are supplied on tape, with simple instructions for conversion to disc/microdrive operation. (This seasons results are supplied with the package so that predictions can start immediately.)



Boxed, with detailed instruction booklet

AVAILABLE FOR Spectrum (48K), Commodore 64, VIC 20 (+16K), AMSTRAD CPC 464, BBC B, Atari (48K), ZX81 (16K), Dragon, Apple II, IBM pc

PRICE £15.00 (all inclusive)

NEW

FIXGEN 84/5

AT LAST! No more struggling for hours to get the fixture list into the computer. FIXGEN has been programmed with all English and Scottish fixtures for 1984/5. Simply type in the date, and the full fixture list is generated in seconds. Fully compatible with Poolswinner.

POOLSWINNER with FIXGEN £16.50 (all inclusive)

Fixgen alone £5.50



COURSEWINNER v3

THE PUNTERS COMPUTER PROGRAM

Coursewinner is designed to allow you to develop and test your own unique winning system. Using information from daily newspapers or 'Sporting Life', the most important factors can be input and analysed. The program is supplied with a database detailing best trainers and jockeys, and effect of the draw for all British courses. (Flat & National Hunt.)

AVAILABLE FOR Spectrum (48K), Commodore 64, BBC B, Dragon, Atari (48K), Apple II

PRICE £12.50 (all inclusive)

AVAILABLE (RETURN OF POST) FROM...



phone 24 hrs



phone 24 hrs



phone 24 hrs

37 COUNCILLOR LANE, CHEADLE, CHESHIRE. ☎ 061-428 7425

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
4,000
DELIGHTED MEMBERS!

SPECIAL OFFER!
YOUR FIRST TWO
TAPES FREE

IF YOU JOIN FROM THIS ISSUE
or send 9"x5" size for free details.
Directors ALEC FRY, ARPS FRSA
and ERNA FRY, BA

■ The first true software library to be set up in the world—and still the largest. ■ Unrivalled tape stock, as you'd expect from our head start! ■ Run on a 16-bit micro with 10 million bytes of program and data on Winchester! aided by six less able but more friendly mere humans. ■ Often imitated (sometimes almost to the letter—flattery indeed!) but never equalled. ■ Friendly, helpful service—at the end of a phone if needed. ■ Free membership of our Discount Club: pounds off peripherals and top-of-the-chart tapes. ■ Any loading problems (rare!) automatically credited. ■ Shop now open (next to Post Office) for rental and discount sales of tapes and peripherals. ■ Branches throughout the world. ■ No complicated schemes, no commitment to quantity. ■ New tapes arriving all the time. ■ Printed, illustrated magazine "Computerchat" packs in more than any mere typed newsletter. ■ Keenest-ever rates. ■ ACCESS holders can join by telephone on 0730 892732. ■ NO RIVAL can offer all this....

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) £8, or join local branch in W. Germany, France, Holland, Belgium, Scandinavia, South Africa, Ireland—send Int. Reply Coupon and we'll forward your enquiry.

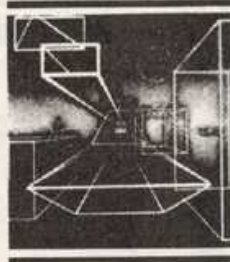
PCWK

TUBE WAY ARMY



Design Design

ROMMEL'S REVENGE



Design Design

JOIN THE AIR FORCE OR THE TANK CORPS

Tube Way Army - star game in the October issue of **Software Today** - 'The super graphics are equal, if not better than the arcade version.'

Dragon User - Tube Way Army is to be recommended £7.95.

Design Design

Rommel's Revenge - When you are dizzy from flying through Tube Way Army, come down to earth and drive yourself dizzy in one of our tanks. Stunning 3D graphics with full perspective and a host of features. £7.95.

Both games are suitable for Dragon 32/64 & Tandy Colour 32K and are available from selected software retailers, Tandy Dealers or mail order from:-

2 Ashton Way, East Herrington, Sunderland SR3 3RX
Trade enquiries welcome: Tel: 061-205 6603

Seeing is believing

See the pack – see the screen – see the game.
See the difference the moment you pick up one
of the games from Firebird's new Silver Range.

The difference is that our packs show the high
quality you'll see on the screen when you play,
so you know exactly what you're buying.

The same high standard applies to all twenty
games in the range and all are available at the
remarkably low price of

£2.50

Firebird

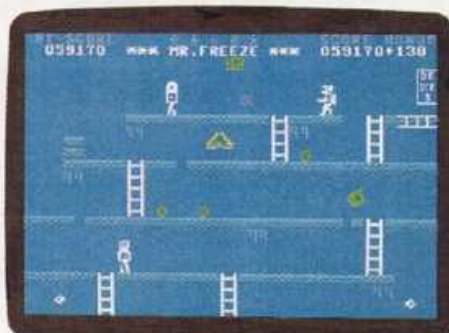
SOFTWARE

Here's a sneak look at three of the NEW games:



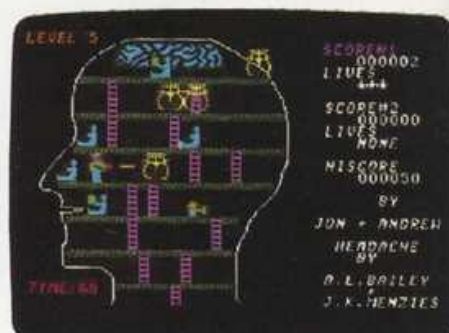
TERRA FORCE

Terra Man defends the earth against
Ygothulu and his marauding hordes
of Demon Bombers and Solar Pods.



MR. FREEZE

Six freezer compartments to de-ice,
each packed with chilling obstacles,
and each tougher than the last.



HEADACHE

Nervous Ned versus Head Banger in
a furious quest to carry messages
to the brain.

Look out for these games in the FIREBIRD silver range at selected high street stores.

SPECTRUM: THE WILD BUNCH · BOOTY · MR. FREEZE · TERRA FORCE · VIKING RAIDERS · MENACE · EXODUS · RUN BABY RUN · CRAZY CAVERNS · BYTE BITTEN. **VIC 20:** SNAKE BITE · MICKEY THE BRICKY.
COMMODORE 64: BOOTY · MR. FREEZE · EXODUS · HEADACHE · ZULU · GOGO THE GHOST. **BBC MICRO B:** BIRD STRIKE · GOLD DIGGER · ACID DROPS · DUCK! · ESTRA · THE HACKER.

The new range from British Telecom.



You'd better believe it!!!

FIREBIRD SOFTWARE, WELLINGTON HOUSE, UPPER ST. MARTIN'S LANE, LONDON WC2H 9DL. TEL: 01-379 6755/5626

Firebird and the Firebird logo are trademarks of British Telecommunications plc.

Particle projection — mind your manners

Plot your flights of fancy with *Projectile* by P. Whitehurst

I wrote this program to visualise how a particle behaves when projected at different velocities and different angles. The resulting program is suitable for a BBC Model A or B, or an Electron, as it utilises mode 4 graphics.

When run, the program asks you first for the velocity of projection, and then for the angle the particle is to be projected at. A graphical representation of its path is then

drawn, with both axes labelled in metres.

After plotting its path, the program asks if you would like to replot the path of a particle with different angle and velocity, or plot the path of the new particle over that of the old. Thus the paths of various different particles may easily be compared with each other.

The program does not make use of procedures, as such things would be consi-

dered to be overkill on the part of the programmer in such a straightforward program.

Program Notes

Lines 10-50 set up Mode 4; input lines for velocity and angle are included, with full error checking. **Lines 60-90** set up the screen, the scales being drawn in metres, and the variables for vertical and horizontal distance and velocity are set up. The direction of velocity is represented in Lines 150 & 160 as an arrow pointing in the direction of projection.

Lines 200-250 plot the path of the particle. The factor of 1/10th in each of the lines regarding a change in distance or velocity is to ensure that an accurate plot is obtained.

Lines 260-280 select whether a superimposed image or a complete replot of the drawing is required.

```
10MODE4
20VDU28.0.4.39.0
30PRINT"Simulation of the path of a particle      projected with velocity v m/s
& at angleA degrees from a point O."
40INPUT"Velocity of projection,v(1-100m/s)",v:IFv<10R v>100THENPRINT"Error!":
GOTO40
```

For a better image



The Sinclair QL gives you the best in micro technology. So why entrust it to a screen that cannot match this?

A blurred, incomplete or fuzzy image can ruin even the best program. Not to mention the strain it may put on your eyes.

Now, we can offer you the monitor to match the micro.

The Prism QL14 colour monitor has been designed to meet the exact needs of the QL.

It gives you clear, pin-sharp graphic images, and the ability to display the full 85 column text available on the QL.

And the light-weight Prism QL14 is fully portable, incorporating a retractable handle and is provided with the necessary connecting cable.

PRISM


```

50INPUT"Angle of projection,A(0-89deg)",A:IFA<0OR A>89THENPRINT"Error!":GOTO5
0
60VDU29,80;100;5
70MOVE1120,0:DRAW0,0:DRAW0,650:MOVE-20,630:DRAW0,650:DRAW20,630:MOVE1100,-20:
DRAW1120,0:DRAW1100,20
80@%=0:FORF=0TO1000STEP100:MOVEF,-10:DRAWF,10:MOVEF,-20:PRINTF/100:NEXT
90FORF=0TO600STEP100:MOVE-10,F:DRAW10,F:MOVE-40,F:PRINTF/100:NEXT
100MOVE180,-50:PRINT"Horizontal distance(*100m)"
110MOVE0,750:PRINT"Height"'"(*100m)"
120VDU24,0;0;1279;800;
130dist=0:height=0
140A=RAD(A)
150MOVE0,0:DRAW200*COS(A),200*SIN(A)
160MOVE180*COS(A+PI/32),180*SIN(A+PI/32):DRAW200*COS(A),200*SIN(A):DRAW180*COS
(A-PI/32),180*SIN(A-PI/32)
170PLOT0,-20,60:PRINT"v":MOVE0,0
180vertvel=v*SINA:horvel=v*COSA
190VDU4
200REPEAT
210DRAWdist,height
220dist=dist+horvel/10
230height=height+vertvel/10
240vertvel=vertvel-9.81/10
250UNTILdist>1280 OR height<0
260VDU28,0,4,39,0,12:PRINT"Press S to superimpose-P to replot"
270IFGET$="S"THENVDU12:GOTO30
280IFGET$="P"THEN:GOTO10

```

..... picture this

At only £199.99, the stylish QL14, finished in matt black and including a detachable anti-glare glass front, ensures that you get the best from your QL.

So for a clearer picture simply speak to your local dealer.

After all, it's not only the image on your QL that's at stake.

TECHNICAL SPECIFICATIONS

Number of columns	85
Tube	90° 14" (34 cm "V") self-converging colour tube
Video Bandwidth	12 MHz
Shadowmask pitch	0.63 mm
Direct RGB input	5 volt pp into 390 ohms
Dimensions	375 mm wide x 375 mm high x 390 mm deep
Weight	12 kg (26 lbs)
Country of origin	UK



Prism Microproducts Limited
 Prism House, 18/29 Mora Street
 City Road, London EC1 8BT
 Telephone: 01-253 2277

M.S.W.M. REVIEW

Something in it for everyone.. Informative, interesting, fun, educational and graphically exciting. Very well formatted.

...The magazine contains such things as games, competitions, utility programs, letters from readers and amazing things you could do with your Spectrum (in the best possible taste!).

It is very well written and an enormous amount of energy is put into each user - friendly magazine. At £2.99 it's very reasonably priced.

ZX COMPUTING

WITH

CURRAH SPEECH

STARBOARD

The sailing dinghy racing game for up to 4 players.

48K SPECTRUM version....£6.95
Or as a board game.....£10.00
Or play BOTH together...£14.95

...fun for all the family.

PITFALL 2 by TREV GLOVER

Easy to play adventure game. REALISTIC 3D. CURRAH SPEECH.

48K SPECTRUM £6.95

AN IDEAL CHRISTMAS PRESENT.

MAIL ORDER ONLY



48K SPECTRUM

OTHER INFINITE SPECTRUM TITLES

TEN GREAT GAMES£7.50 □
SOUND-LIGHT GENERATOR..£3.99 □
CHARACTERS SETS.....£3.99 □
SUPAFILE 150.....£4.99 □
STORYMAKER FOR KIDS....£4.99 □
M/CODE SOUND LIBRARY...£3.99 □

TICK THE TITLES YOU WOULD LIKE
-CUT OUT THIS FORM AND SEND IT
TO US AT THIS ADDRESS: >>

SEND ORDER TO>>

INFINITE SOFTWARE
73 ALCESTER ROAD,
MOSELEY,
BIRMINGHAM 13.

PLEASE SEND ME THE FOLLOWING:-

M.S.W.M.#4.....£2.99 □
M.S.W.M.#5.....£2.99 □
M.S.W.M.#6.....£2.99 □
M.S.W.M.#7.....£2.99 □
M.S.W.M. VOL 2:1.....£2.99 □

SEND ORDER TO: >>



COMMODORE 64

SPECTRUM

GAME	RRP	OUR PRICE
ROTRONICS WAFERDRIVE	129.95	129.95
SHERLOCK HOLMES	14.95	9.99
KOKOTONI WILF	5.95	4.75
DUESEX MACHINA	15.00	10.75
KNIGHT LORE	9.95	6.95
DAHK STAR	7.95	4.99
SABREWOLF	9.95	6.75
DALEY THOMPSON DECATHLON	6.90	4.99
BEACHHEAD	7.95	5.60
WHITE LIGHTNING	14.95	9.99
HOBBIT**	14.95	9.99
LORDS OF MIDNIGHT	9.95	5.99
PSYTRON	7.95	5.99
JET SET WILLY	5.95	4.50
FRANK N. STEIN	5.95	4.50
TORNADO LOW LEVEL	5.95	4.60
TRASHMAN	5.95	4.40
FIGHTER PILOT	7.95	5.99
NIGHT GUNNER	6.95	5.25
CLASSIC ADVENTURE	6.95	5.50
VALHALLA	14.95	9.99
MONTY MOLE	6.95	4.99
FULL THROTTLE	6.95	5.75
MATCHPOINT	7.95	5.99
AVALON	7.95	5.50
HERO	7.95	5.50
BATTLECARS	7.95	5.99
RIVER RAID	7.95	5.50
ENDURO	7.95	5.50
HAMPSTEAD	9.95	6.95
PSYTRAXX	7.95	5.50
STARBIKE	6.95	4.99
GIANTS REVENGE	6.95	4.99
SCRABBLE	15.95	9.99
EDDIE KIDD JUMP CHALLENGE	6.95	4.75
COMBAT LYNX	7.95	5.50
TWIN KINGDOM VALLEY	7.95	4.99
TRAVEL WITH TRASHMAN	5.95	4.75
DOOM DARKS REVENGE	9.95	5.99
HAVOC	7.95	5.95
POLTERGEIST	5.95	4.50
BACKPACKER GUIDE TO THE UNIVERSE	7.50	5.25
QUASIMODO REVENGE	6.90	4.90
TIRNANOG	9.95	6.75
AIRWOLF	6.90	5.20
PYJAMARAMA	6.95	5.25
RAM TURBO INTERFACE	22.95	18.00
ZXSPECTRUM EXPANSION SYSTEM	99.95	99.95

GAME

GAME	RRP	OUR PRICE
RAID OVER MOSCOW	9.95	7.70
PSYWARRIOR	9.95	6.99
SUICIDE EXPRESS	7.95	6.50
GHOSTBUSTERS	10.95	8.50
ACTIVISION ALL OTHER TITLES	9.95	7.50
JET SET WILLY	7.90	5.75
ZIM SALA BIM	9.95	6.99
STRIP POKER	9.95	7.25
BLACK HAWK	7.95	5.50
PSYTRON 64	7.95	5.50
ASTEC	8.95	7.25
ANKH	8.95	7.25
MR ROBOT	8.95	7.25
HOBBIT**	14.95	9.99
TALES OF ARABIAN NIGHTS	7.00	5.50
DALEY THOMPSON DECATHLON	7.95	5.99
BEACH HEAD	9.95	7.75
DECATHLON	9.99	7.95
MONTY MOLE	7.95	6.50
SOLO FLIGHT	14.95	11.00
TRASHMAN 64	7.95	6.50
VALHALLA	14.95	10.99
DEATH STAR INTERCEPTOR	9.95	8.50
PITFALL II	9.95	7.50
RIVER RAID	9.95	7.50
HERO	9.95	7.50
BRUCE LEE	9.95	7.50
NATO COMMANDER	9.95	7.25
SPIRIT ACE	9.95	7.25
EDDIE KIDD JUMP CHALLENGE	7.95	5.50
STUNT BIKE	6.90	4.99
MY CHESS 11	8.95	7.25
BATTLE FOR MIDWAY	9.95	8.99
HAVOC	9.95	7.95
ANCIPITAL	7.50	5.50
QUASIMODO REVENGE	7.90	5.90
TORNADO LOW LEVEL	7.90	5.90
JONY AND THE JIMPYS	6.90	5.25
KOKO TONI WILF	6.90	5.25
ZAXXON	9.95	7.25
FORT APOCALYPSE	9.95	7.25
SUMMER GAMES	14.95	10.50
QUO VADIS	9.95	7.25
SHERLOCK HOLMES	14.95	10.50
CHART BUSTERS	9.95	7.50
COMBAT LYNX	8.95	7.25
PITFALL I	9.99	7.50

SPECIAL OFFER

	OUR PRICE
SPECTRUM 48K	129.95
SOFTWARE PACKAGE WORTH	56.00
KEMPSTON TYPE INTERFACE	14.95
QUICKSHOT II JOYSTICK	11.95

TOTAL VALUE 212.85

OUR PRICE £145.00

(This offer is not included in the 10% discount for orders over £50)

BBC GAMES

GAME	RRP	OUR PRICE
OLD FATHER TIME	9.50	7.50
CITY DEFENCE	7.50	5.95
MUSIC SYNTHESIZER	9.50	7.50
TWIN KINGDOM VALLEY	9.50	7.50
HULK	7.95	6.50
AVIATOR	14.95	11.00
BLAGGER	7.95	6.95
JCB DIGGER	9.95	8.50
HOBBIT	14.95	9.99
VOODOO CASTLE	9.95	8.50
CHARTBUSTER	9.95	7.50
ELITE	14.95	10.50

ELECTRON GAMES

GAME	RRP	OUR PRICE
MICRO OLYMPICS	5.95	4.75
TWIN KINGDOM VALLEY	9.50	7.50
HULK	7.95	6.50
ALL ACORN SOFT	9.20	7.50
CHUCKIE EGG	7.90	6.50
BLAGGER	7.95	6.50

ALL PRICES INCLUDE P&P

QUICKSHOT II ONLY £8.99

PLEASE NOTE IF YOUR ORDER

EXCEEDS £50 YOU GET

10% FURTHER DISCOUNT

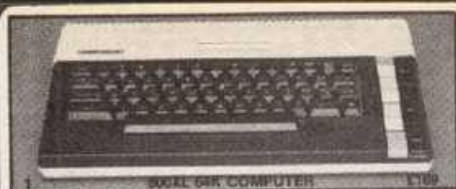
SEND CHEQUES/P.O. TO

GOODBYTE

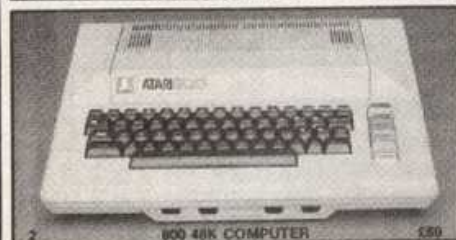
PCW10

94 LEATHER LANE, LONDON EC1

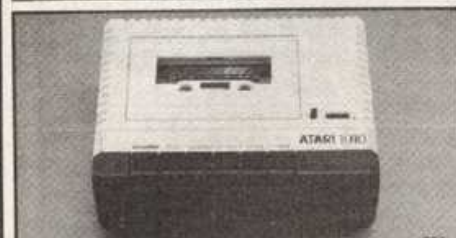
PLEASE STATE WHICH MICRO



800XL 64K COMPUTER £169



800 48K COMPUTER £89



ATARI 1050

1050 127K DISK DRIVE £199



1020 4 COLOUR PRINTER £99



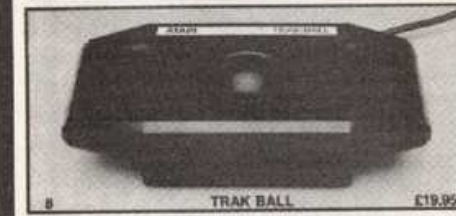
1027 LETTER QUALITY PRINTER £249



1020 4 COLOUR PRINTER £99



1027 LETTER QUALITY PRINTER £249



TRAK BALL £19.95



SUPER CONTROLLER £14.95

ATARI XL

THE NEW ATARI 64K 800XL £169

EVERYTHING YOU WANT FROM A HOME COMPUTER

1. **ATARI 64K 800XL - £169:** The Atari 800XL has many facilities and includes such advanced specifications that you will be amazed by its performance. At the new retail price of only £169 for a full specification 64K computer with a proper full stroke keyboard, we believe that the 800XL cannot be beaten. Just look at the following specifications:

COLOUR CAPABILITIES: 16 colours and 16 intensities giving 256 different colours (all of the 256 colours can be displayed at the same time).

OPERATING SYSTEM: 24K ROM including Atari Basic programming language and a self diagnostic test program.

KEYBOARD: Full stroke design with 62 keys including help key and 4 special function keys, international character set and 29 graphics keys.

SOUND: 4 independent sound synthesizers each capable of producing music across a 3½ octave range or a wide variety of special sound effects. (Additional programming can achieve an octave range of up to nine octaves).

DISPLAY: 11 graphic modes and 5 text modes. Up to 320x192 resolution. Maximum text display 24 lines by 40 columns.

SPECIAL ATARI INTEGRATED CIRCUITS: GTIA for graphics display, Pokey for sound and controller ports. Antic for screen control and I/O (Input/Output).

CPU: 6502C microprocessor - 0.50 microsecond cycle and a clock speed of 1.79 MHz.

EXTENDED GRAPHICS FUNCTIONS: High resolution graphics. Multi-coloured character set. Software screen switching. Multiple redefined character sets. Player missile (sprite) graphics. Fine screen scrolling. Changeable colour registers. Smooth character movement. Simple colour animation facilities.

PROGRAMMING FEATURES: Built in Atari Basic programming language supporting peek, poke and USR plus at least 8 other languages available. The help key will provide additional information and menu screens with certain software. Full on-screen editing is available as well as syntax checking on entry.

INPUT/OUTPUT: External processor bus for expansion with memory and peripherals. Composite video monitor output. Peripheral port for direct connection to Atari standard peripherals. Software cartridge slot is included as well as 2 joystick controller ports.

SOFTWARE: Over 1,500 items of software are available including self teaching programs with unique voice over. The range of programs includes Education, Home Management & Programming aids. There is also APX (Atari Program Exchange) and of course Atari's famous entertainment software now at only £9.95. In addition there is a host of support and help available from specialist Atari magazines like Antic and Analog and from over 75 Atari books/manuals.

2. **ATARI 800 48K COMPUTER - £89:** We have a limited number of the MK1 model 800 computer with 48K. The price is £89 (as a games machine) or £99 with the Basic Programmer Kit (Basic cartridge & 2 manuals). Both come with a full 12 months guarantee.

3. **ATARI 1010 PROGRAM RECORDER - £34:** For low cost storage and retrieval capability. Data transmission 600 baud. Storage capability 100K bytes on a sixty minute cassette. Track configuration four track, two channels (digital and audio). Auto record/playback/pause control/unique soundthrough facility. Also included is built in accidental erasure prevention and automatic shutoff after each program as well as a 3 digit tape counter.

4. **ATARI 1050 DUAL DENSITY DISK DRIVE - £199:** 5¼" disks holding 127K randomly accessible bytes provide both expansion and flexibility for your 400/800 or XL system with new 'helpful' DOS 3. All customers who purchase a Disk Drive from Silica Shop will be automatically given a FREE set of 100 programs on 3 Disks recorded on both sides.

5. **ATARI 1020 COLOUR PRINTER - £99:** Printer and Plotter with four colour graphic print capability. 40 column width printing at 10 characters per second. Can print 5, 10 and 20 characters per inch. 64 character sizes. Prints text in 4 directions. Choice of line types.

6. **ATARI 1027 LETTER QUALITY PRINTER - £249:** For word processing letters in professional type. Print speed of 20 chars per second.

7. **ATARI TOUCH TABLET - £49:** Enables you to draw and paint pictures on your T.V. screen, with the touch of a stylus.

8. **ATARI TRAK BALL CONTROLLER - £19.95:** Enables cursor movement in any direction and adds arcade realism to your games.

9. **ATARI SUPER CONTROLLER - £9.95:** The ultimate joystick with double fire button to give you a greater competitive edge in your games.

SILICA SHOP ARE THE No1 ATARI SPECIALIST

Silica Shop are now firmly established as the No 1 Atari retail/mail order and wholesale specialist in the U.K. We already offer our service to over 120,000 customers, 10,000 of whom have purchased Atari Home Computers. Because we specialise (and with a turnover of £1.5 million), we are able to keep prices low by bulk purchases. Ring one of our 45 staff and we will be glad to be of service to you. Complete the coupon below and we will send you our Atari pack with price list and colour catalogue.

EXTENDED TWO YEAR GUARANTEE: We are an Atari Service Centre, able to service and repair Atari equipment and have added a 12 month guarantee to the year offered by Atari, giving you a full 2 year guarantee on your computer if you buy it from us.

SPECIALIST SUPPORT: Our technical staff are always available on the telephone to help and advise you. We endeavour to hold stocks of every Atari compatible item available in the U.K. and we stock over 75 Atari books and manuals.

AFTER SALES SERVICE: Your name will automatically be added to our mailing list and you will receive price lists, newsletters and details of new releases and developments as well as special offers which are exclusive to Silica Atari Computer Owners.

LOW PRICES: Our prices are extremely competitive and we will normally match any lower price offered by our competitors.

FREE COMPUTER OWNERS CLUB: This is open to all Atari computer owners irrespective of where you purchased your equipment. Membership is FREE and entitles you to receive bulletins giving details of new releases and developments. Send now for your FREE information pack, price list & colour catalogue.

PAYMENT: We accept cash, cheques, postal orders and all Credit Cards. We also offer credit facilities over 1, 2 or 3 years, please write for a written quotation.

NEXT DAY DELIVERY - FREE: All goods despatched from Silica Shop are normally sent by first class post or parcel post FREE OF CHARGE. As a special introductory offer for a limited period only we will be sending all Computers and Disk Drives by a next day delivery service at our expense.

So fill in the coupon below with a literature enquiry or order and begin to experience a specialist Atari service that is second to none.

SILICA SHOP LTD, 1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX Tel: 01-309 1111

ORDER NOW-OR SEND FOR A FREE COLOUR BROCHURE

To: SILICA SHOP LTD, Dept PCWK1184, 1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX Telephone: 01-309 1111

LITERATURE REQUEST:

☐ Please send me your FREE colour brochures and 16 page price list on Atari Computers.

☐ I own a Videogame ☐ I own a Computer

Mr/Mrs/Ms: Initials: Surname:

Address:

Postcode:

ORDER REQUEST:

Please send me:

<input type="checkbox"/> 800XL 64K Computer	£169	<input type="checkbox"/> 1020 4 Colour Printer	£99
<input type="checkbox"/> 800 48K Computer	£89	<input type="checkbox"/> Letter Quality Printer	£249
<input type="checkbox"/> 1010 Program Recorder	£34	<input type="checkbox"/> Touch Tablet + Cartridge	£49
<input type="checkbox"/> 1050 127K Disk Drive	£199	<input type="checkbox"/> Trak Ball	£19.95
		<input type="checkbox"/> Super Controller	£9.95

☐ I enclose Cheque/P.O. payable to Silica Shop Limited for the following amount £

☐ CREDIT CARD - Please debit my Access/Barclaycard/Visa/American Express/Diners Club

☐ Card Number

We are always actively seeking programs for publication — either for Open Forum, the machine pages or Star Game. When sending in a program for consideration, a clear program listing should be sent, together with, wherever possible, a saved copy on cassette. Documentation — usually not more than 1000 words — should start with a general description of the program, what it does, and then some detail of how the program itself is constructed. We pay very competitive rates, according to the length and nature of the program and the quality of the accompanying documentation.

Scrolling

on Spectrum

Innumerable scrolling routines have been published, many of them for the Spectrum. This one probably is the best in terms of

memory consumption and speed: the program scrolls the whole screen left or right four pixels in just 38 bytes (19 bytes for each routine). The code itself is position-independent, but when using the Basic loader (see listing), the screen is scrolled left using *Randomise Usr 64000* and right using *Randomise Usr 64020*.

The secret of the routines' shortness is the use of the much underused BCD rotation instructions in the Z80's instruction set: RLD and RRD. In effect, the routine treats each line of the screen as a 32 byte long BCD number and rotates it left or right, hence appearing to move the line left or right by 4 pixels.

```
10 REM *****
20 REM # BASIC Loader #
30 REM # For Left/Right #
40 REM # Pixel scrolling #
50 REM #
60 REM # By H.C.Dereli #
70 REM *****
80 CLEAR 63999
90 FOR f=64000 TO 64037: READ
a: POKE f,a: NEXT f
100 DATA 243,33,223,87,14,191,6
102,175,237,111,43,16,251,13,32,
245,251,201
110 DATA 243,33,0,64,14,191,6,0
112,175,237,103,35,16,251,13,32,24
114,251,201
```

```
10 REM *****
20 REM # BASIC Loader #
30 REM # For Left/Right #
40 REM # Pixel scrolling #
50 REM #
60 REM # By H.C.Dereli #
70 REM *****
80 CLEAR 63999
90 FOR f=64000 TO 64037: READ
a: POKE f,a: NEXT f
100 DATA 243,33,223,87,14,191,6
102,175,237,111,43,16,251,13,32,
245,251,201
110 DATA 243,33,0,64,14,191,6,0
112,175,237,103,35,16,251,13,32,24
114,251,201
```

Arcade Avenue



No sprites

Elite is by any accounts a major piece of programming. By combining its talent for arcade programming and its intellectual aspirations, Acornsoft has produced a game that must pass as the closest simulation of what the space age could look like that we have yet seen on a micro.

For those that don't know it is a kind of cross between a *Kingdom* strategy game, *Battlezone*, and a fully three-dimensional flight simulator (I know all flight simulators are supposed to be 3D but in space you can fly at any angle you chose without worrying about a premature rendezvous with the ground). Unfortunately, it has confirmed a suspicion that I

have long had that real space flight, and especially space combat, is so complex, disorientating and frustrating that it's best left to the battle computers whilst we humans get on with playing *Galaxion*.

Anyway, for those with greater mental capacity and determination here is a tip that was passed on to me by one of our reviewers on how to dock with the space station. Find the point 'S' that is halfway on the line between the planet and the station. Rotate to make the line horizontal and cut engines when the station is square with the side window. Then rotate 90°, adjust to point directly at the station, and rotate till the station is fixed like rectangle in view. I hope that means more to Beeb owners than it does to me.

One of the most popular games of recent years amongst some of the PCW staff was Crystal's (now Design-Design Software) *Halls of the Things*. Personally, I have to agree with Tony Bridge's high estimation of this game because although it is now looking a bit dated

graphically, I must rate it as the most lasting game in my collection in terms of addictivity.

The good news is that it has now been released for the CBM 64 with the addition of a little sound and the welcome option of user defined keys and joystick control. Otherwise, the game is an almost exact copy of the Spectrum original, even down to the simulated Spectrum loading screen. An Amstrad version is also underway.

Design-Design have also made a selling point of the fact that their new game, *Dark Star* has no sprites. Their contention is that sprite-based machines like the MSX range are limited in their graphic capabilities by this hardware commitment. The company has preferred to concentrate on writing software, like *Halls*, where the programming effort has concentrate on writing software, like *Halls*, where the *Dark Star* is therefore completely devoid of cute shapes with names like Rotten Ron and Berky Bill, but is rather

a 'vector graphics' space game where you are faced with an interstellar flight of breathtaking speed worthy of a place in any alien basher's collection. The concept of user defined keys has also been stretched to its limit with most keys definable to perform any game function, or combination of functions that you may wish.

Finally, for those who think horrendous spelling gaffes are the prerogative of Tony Bridge's adventure games take a look at the adverts for Software Project's new game *Heebie Jeebies* where "you play the roll of a spider". In next week's column I will be playing the sandwich of a centipede.

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.


```

00010 ;left and right
scroller
00020 ;in medium
resolution (4 pixels)
00030
00040 ;I LEFT SCROLL ]
00050
00060 org 64000
00070 lscrol ld hl,22495
00080 ld c,191
00090
00100 xor a
00110 rld
00120 dec hl
00130 djnz l2
00140 dec c
00150 jr nz,l1
00160 ret
00170 ;I RIGHT SCROLL ]
00180
00190 rscrol ld hl,15384
00200 ld c,191
00210 l1 ld b,32
00220 xor a
00230 rrd
00240 inc hl
00250 djnz l12
00260 dec c
00270 jr nz,l11
ret

```

Scrolling
by H Dereli

Retrieve

on CBM 64

This simple program will let you 'unnew' your newed basic program. Before you start typing in any magazine listings etc, Load

and Run the program.

Now type in New and enter in your listing normally. If by accident you do type in New while entering in your listing, follow out Step 5.

To test out the memory retrieve program do the following:

1 Load and Run the memory retrieve program

2 Type in New

3 Load in a Basic program and List

4 Now type in New and then List

5 Now type in SYSS0000 to retrieve your original program.

```

10 FORTG=2T025
20 READ AB
25 A=A+AB
30 POKE50000+TG,AB
40 NEXTTG
45 IFA<>2552THENPRINT"DATA
SUM ERROR":EN

```

```

D
50 DATA169,8,160,1,145,43
60 DATA32,51,165,165,34
70 DATA133,145,133,47,133
80 DATA49,165,35,133,46
90 DATA133,148,133,50,96

```

Retrieve
by S Sindhar

Microradio

GW6JJN



Packet Radio

To many of us, Packet Radio still seems the best bet in Radio Computing. It is a form of communication that is used in Amateur Radio in Canada and the United States, and slowly, becoming more popular in the United Kingdom.

The reason for the rise in interest here is manifold. It means that many users can use the same radio frequency simultaneously; it means that data can be sent accurately and surely even in the most difficult conditions, and it is about 20 times faster than RTTY and AMTOR. When a network of intelligent terminals are set up, data can be routed from node

to node with extremely high integrity.

One example of the rising interest is a letter to Microradio from Trevor Tugwell G6TJT of Stevenage, Herts. Trevor writes in to say that several people in the Hertfordshire area have been active on Packet Radio since the beginning of the year, experimenting with various protocols. They have finally settled by standardising on a program written by Peter Robinson G6GIX for the BBC Model B.

This program has proved popular mainly because of the ease with which it can be implemented, not requiring any modems or interfaces and all input and output is via the cassette port.

The program has limitations such as the low baud rate of 300 baud, but it works effectively. To this end there is a regular Packet Radio net every Monday evening at 8pm on 144.675MHz which covers the Herts, Beds and North London areas. This particular frequen-

cy has developed as the regular packet frequency in the area and the program is spreading across the country as other local Packet groups develop.

In addition, local amateurs have been experimenting with the Amateur Packet Standard AX.25 which they have running at around 1200 baud with very good results. Already they are capable of running five or six simultaneous independent contacts on the same frequency channel.

It is this economy of spectrum space that is the great appeal of Packet Radio on the crowded amateur bands. The AX.25 protocol is implemented by the use of a separate board with its own microprocessor. Ram and Rom and has the obvious advantage that it can be run on any micro that has a serial RS232 port. The microcomputer in fact acts just as a dumb terminal running a program capable of sending ASCII information through its serial port.

Thanks to Trevor and I would be very grateful to anyone else who can update this report with news of other Packet groups. I would very much like to see a circuit diagram or a prototype of the terminal board, so if you have any information, please write in to the column.

Microradio has promoted the idea of Packet in the UK as the best solution to error-free communication by computers in radio and I am glad to pass on any information that might help to advance the possibilities that Packet Radio offers. Trevor Tugwell can be reached at 11 The Dell, Stevenage, Herts SG1 1PH.

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.

UFO Attack

on Vic 20

UFO Attack is an interesting game for the unexpanded Vic 20 the object of the game is to destroy as many of the UFOs as possible within the two minute time limit. You are in control of a destroyer based on earth and

attack the UFOs with missiles.

Program Notes

Lines 1 to 20	Set up variables
Lines 21 to 80	Main program loop
Lines 81 to 103	Instructions

```

1 POKE36879,61
2 GOTO81
3 PRINT"*****"
4 POKE36879,8
5 DEFNBR(X)=INT(X/RND(2))*1
6 N0=36877:V=36878:SO=36876
7 REM**BACKGROUNDS**
8 PRINT" "
9 S4=" "
10 T4=" "
11 T4=C0=30720
12 T4=" "
13 SP4=" "
14 C4=" "
15 L4=" "
16 IF4=1THENG0
17 PRINT"*****"
18 POKE165,227 POKE3695,7
19 POKE198,0
20 T4="000000"
21 GOTO39
22 IF T4="000200" THEN GOTO3
23 IF C0 THEN GOTO35
24 GOTO59
25 POKE0,0
26 PRINT"*****YOUR SCORE IS: SC FOR T=1 TO 5000 NEXT CLR GOTO3
27 POKE50,0 POKE38417,1 GETAF:IFAF="0" THEN GOTO3
28 IF FEEK(283)=64 THEN GOTO3
29 IF FEEK(283)=12 THEN T=T+1 GOTO38
30 IF FEEK(283)=13 THEN T=T+1 GOTO38
31 GOTO20
32 IF T=0 THEN T=T+1 GOTO20
33 IF T=14 THEN T=T+1 GOTO20
34 PRINT"*****"
35 IF FEEK(M)=93 THEN FOKEL,32
36 POKE50,250 N=6100+POKEN,23 POKEH+CO,1 C=1 I=T+1 GOTO59
37 POKE50,0 POKEH,32 N=N-22 C=C+1
38 IF C=15 THEN C=0 GOTO59
39 IF FEEK(M)=92 THEN POKEH+CO,1 POKEH,93 GOTO59
40 GOSUB52 GOSUB74 C=0 SC=SC+20+E
41 D=FNR(3):G=FNR(10)
42 B=INT(2*RND(1))*2-1
43 GOSUB51 POKEV,D
44 ON GOSUB51,44,44,44,44,47,47,47,47,50,50
45 PRINT SP4:T(4)=0 E=4 POKEH,152 GOTO59
46 POKEH,210 E=2
47 IF B=1 THEN T(2)=0 PRINT T4 GOTO59
48 T(2)=14 PRINT TAB(14);T4 GOTO59
49 E=1 POKEH,220
50 IF B=1 THEN T(1)=0 PRINT C4 GOTO59
51 T(1)=14 PRINT TAB(14);C4 GOTO59
52 POKEH,134 PRINT TAB(14);L4:T(3)=14 E=3 GOTO59
53 PRINT"*****" FOR K=1 TO 50 PRINT NEXT RETURN
54 GOSUB51 PRINT TAB(1);POKEV,15
55 FOR K=255 TO 128 STEP-1:POKEH,X: NEXT POKEH,136
56 GOTO75
57 FOR K=0 TO 95 STEP-1:POKEV,X: NEXT
58 POKEV,2:POKE198,0
59 POKEH,0:GOSUB51 RETURN
60 REM MOVES SHIPS
61 POKE38417,0
62 GOSUB51
63 ONEGOTO968,65,71,62
64 T(4)=T(4)+1
65 IF T(4)=16 THEN GOSUB74:GOTO39
66 PRINT TAB(T(4));SP4 GOTO25
67 T(2)=T(2)+8
68 IF T(2)=10 RT(2)=16 THEN GOSUB74:GOTO39
69 PRINT TAB(T(2));T4:GOTO25
70 T(1)=T(1)+8
71 IF T(1)=10 RT(1)=15 THEN GOSUB74:GOTO39
72 PRINT TAB(T(1));C4:GOTO25
73 T(3)=T(3)+1
74 IF T(3)=8 THEN GOSUB74:GOTO39
75 PRINT TAB(T(3));L4:GOTO25
76 PRINT"*****"
77 PRINT"*****" RETURN
78 GOSUB51:GOSUB74
79 PRINT"*****SPC(T(E))"
80 REM BONUS POINTS
79 IF I>T(E)+3 THEN SC=SC+T(E)+6-I*10:GOTO55
80 SC=SC+1-T(E)*10:GOTO55
81 PRINT"*****UFO-ATTACK*****"
82 GOSUB51
83 PRINT"*****"
84 PRINT"*****" BY RAN 0'KEEFE"
85 FOR K=1 TO 7000: NEXT
86 PRINT"*****DESTROY AS MANY UFO CRAFT AS POSSIBLE IN 10 MINUTES...."
87 K=1 GOTO3
88 K=0
89 PRINT"K: C4: M- 20 POINTS"
90 PRINT"K: T4: M- 40 POINTS"
91 PRINT"K: L4: M- 60 POINTS"
92 PRINT"K: SP4: M- 80 POINTS"
93 PRINT"K: M+ BONUS POINTS!"
94 FOR K=1 TO 6000: NEXT
95 PRINT"*****DESTROYER CONTROLS"
96 PRINT"K: 'I' - DESTROYER LEFT"
97 PRINT"K: 'P' - DESTROYER RIGHT"
98 PRINT"K: 'O' - MISSILE CONTROL"
99 PRINT"*****PRESS A KEY TO START."
100 POKE198,0
101 GETAF:IFAF="" THEN GOTO1
102 GOTO3
103 STOP

```

UFO Attack

by M O'Keefe

Baud Walk



Price war

Well, the price battle over the modems as forecast has really set the database world alight. Enter Unicom, the all-singing, all-dancing modem for hobbyists at a neat £57, although don't forget that the software to operate it costs another £20.

Unicom reckoned that if other modem manufacturers claimed 2000 sales a month, then they must be making fat profits. Well, I would love to get hold of a Unicom — they've promised to send me one — so that I can see exactly what components are inside and how they've managed to build it for around £35, assuming the price isn't there because they love us baud walkers.

Unicom say they have only used existing components and the modem is assembled by a number of different companies in the UK. It revolves around the AMD 9810 chip which I happen to know costs £13 — if you order a million off! Whatever, it's got to be great news.

Modems offering similar capabilities currently sell for around £125 plus.

Software for the BBC micro is coming first, followed apparently by Commodore 64 and Spectrum, although the Spectrum's lack of an R5232 part may inhibit matters. Apparently the Unicom is at the moment in for BT approval which takes anything from three to six months so I'm reserving my judgement until I've actually used it. Write to 20 Orange Street, London WC2 for more details.

Another sign of the times — the Prisms VTX5000 modem which carries on-board software for the Spectrum is now appearing in some places at

only £69.95 having dropped from £99.95 and again from £79.95 in some stores. The modem is 1200/75 1200/1200 baud and has user-to-user software as well as Micronet 800/viewdata software. Call 01-253 2277 for details.

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 019993727.

"CADCAM WARRIOR"

"Who?"

"CADCAM WARRIOR,
it's got over 8,000 screens!"

"WHAT!!"

"CADCAM WARRIOR.
The unique 3-D arcade concept."

"Bocks."**

"CADCAM WARRIOR!
See for yourself."

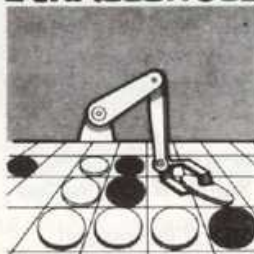
"When?"

"CADCAM WARRIOR.
Out now from TASKSET."

"Great!"

AMSTRAD CPC464 SOFTWARE

THE MOORS CHALLENGE



THE MOORS CHALLENGE

£6.95

An ancient game of strategy and cunning. 'Capture' all your opponents counters to win. Play against your Amstrad CPC 464 at any of five skill levels, from simple to advanced or play against a friend, you can even make the computer play against itself.

THE ROYAL QUEST

£6.95

Can you discover the object of your quest and then complete it? A classic text only adventure, with dozens of problems to

keep you perplexed for weeks. Features include save game facility and very large vocabulary.

ROLLABALL

£6.95

A challenging game of skill, relying on quick wits and steady nerves. Can you keep the ROLLABALL in motion?

All you have to do is slide a piece of track in its path to divert it, trouble is the tracks always disappear when the ROLLABALL moves over them. A very addictive one player game.

★★★ SPECIAL OFFER ★★★

For a limited period only* Timeslip Software will be giving away one free title with every two titles purchased, so hurry send cheque/P.O.'s payable to...

TIMESLIP SOFTWARE

STONEBURN WORKSHOPS
THE OLD PRIMARY SCHOOL
STONEBURN, WEST LOTHIAN EH47 8AP

*Offer ends 31st November 1984

**You haven't lived until
you've died in**

MUD

**"I'll admit to
being hooked"**

POPULAR
COMPUTING
WEEKLY

**"MUD leaves other
adventures for dead"**
PERSONAL COMPUTER
WORLD

**"'Normal' adventure games will never
be the same again"** BIG K

From Century Communications Ltd

Now available on

Compunet

CENTURY

TURBO CHARGE YOUR SPECTRUM



Outperforms any Spectrum interface

The unique Turbo interface from Ram gives you all these features – and more – in one unit:

- * A variety of interfaces including: Rom cartridges, two 9-way D plugs for standard joysticks, PLUS full expansion bus at rear.
- * Compatible with Kempston and Protek protocols.
- * Works with latest Quickshot Mk II auto rapid-fire joysticks!
- * Choice of Rom cartridge or tape cassette software.
- * Instant program loading with cartridge software.
- * Built-in power safety device – unique to Ram Turbo.
- * Full one year guarantee.
- * Immediate availability – 24 Hr despatch on receipt of P.O./ credit card details (cheques – seven days).
- * Incredible value – only £22.95.

So don't wait around – simply complete the coupon and send it to us today.

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

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

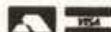
Please send me:

_____ Spectrum Turbo Interface(s) at £22.95
+ £1 p+p (overseas orders £3 p+p)

_____ Quickshot II Joystick(s) at £9.95

(Only when purchased with Turbo – normally £12.95 + £1 p+p)

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



Name _____

Address _____

Tel _____

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

24 Hr
despatch for
credit cards and
postal orders



Trade and export enquiries welcome.

PCWK

Open Forum

Fred

on Vic 20

This is a two player game for the unexpanded Vic 20. The unlikely scenario...Fred has just seen Tron on video, and has got

quite carried away. He has dug a trough around the living room and asked Edna (the wife) for a game of light cycles. Edna wasn't very pleased. Watch out for the deadly gas.

Controls: Edna — 'M'=left, '.' = right, ',' = down, ':' = up Fred — 'C' = right,

'X' = left, 'A' = up, 'Z' = down

Program Notes

60-90 Draws border
150-240 Checks movement
250-350 Moves Edna and Fred
9000-9060 Messages

```
5 POKE36876,0
10 PRINT"J"
15 N=INT(RND(1)*255):M=INT(RND(1)*255)
20 POKE36879,59:POKE650,255:POKE36878,15
30 PF=7908:PE=7912
40 V=-1:U=1
50 B=102:A=81:C=30720
60 FORI=0TO21:POKE7680+I,B:POKE38400+I,6:NEXT
70 FORI=7701TO8185STEP22:POKEI,102:POKEI+C,6:NEXT
80 FORI=8185TO8164STEP-1:POKEI,102:POKEI+C,6:NEXT
90 FORI=8164TO7680STEP-22:POKEI,102:POKEI+C,6:NEXT
95 POKEPF,81:POKEPF+C,2
100 POKEPE,81:POKEPE+C,4
150 GETF$:IFF$="" THEN250
155 IFF$="C" THENV=1:GOTO250
160 IFF$="X" THENV=-1:GOTO250
170 IFF$="R" THENV=-22:GOTO250
180 IFF$="Z" THENV=22:GOTO250
210 IFF$="M" THENU=-1:GOTO255
220 IFF$="," THENU=1:GOTO255
230 IFF$=":" THENU=22:GOTO255
240 IFF$="." THENU=-22
```

Book Ends



Book *The Amstrad CPC464 Explored* Price £7.95 **Micro** Amstrad Supplier Kuma Computers, 12 Horseshoe Park, Pangbourne, Berks.

All things considered there are few books on the Amstrad computer. Considering the mad rush to get QL books out, the Amstrad, which was well received and appears to be doing well, is shunned as though it has a social disease.

Kuma, who have been supporting the Amstrad with software, have now produced one of the first books for it. It is in the 'general guide' style covering simple programming in Basic and toying briefly with machine code.

There are five broad sections covering basic setting up, using music, graphics, assembly language and ending with the construction and analysis of a fairly substantial home accounting program. There are other programs throughout the

book illustrating each new item.

The book is well written and thorough, although probably not as 'idiot level' as some other introductory books — no cartoon characters and colour diagrams here. Quite a good book, but fairly expensive, too.

Graham Taylor



Book *Creative Computer Graphics* Price £15.95 **Micro** General Supplier Cambridge University Press, Publishing Division, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU.

Now here's a book I'd like to see stuffed into my Christmas stocking — *Creative Computer Graphics* is a large format book chock full of illustrations of graphics created by computers.

The book aims to show just what is currently being achieved in computer graphics from films like *Tron* and the

awesome-looking but as yet unfinished, *The Work* to commercial designs like the Channel Four logo.

It's a coffee table book really, rather than a serious educational tome — although the text surrounding the lavish illustrations is interesting, if not deeply analytical. Personally, I love coffee table books and this one is one of the most flickable I've seen.

Some of the pictures I've not seen before and some of the graphics are astounding, although not the sort of thing your going to see on your home micro. Not that micros are completely ignored; there is a section towards the end of the book which covers games and mentions a few favourites like *Valhalla* and *Commodore's Soccer*. The choices are a bit random and some pictures which are evidently from Psion's QL packages are described as being on the Spectrum computer — nevertheless a brilliant Christmas present.

Graham Taylor



Book *Oric Atmos and Oric 1 Graphics and Machine Code Techniques* **Micro** Oric 1 and Atmos Price £7.95 **Supplier** McGraw-Hill Book Company (UK), Shoppehangers Road, Maidenhead, Berkshire.

To make full use of Geoff Phillips' book you will need to know not only what machine-code is but also have some idea how to manipulate all those numbers.

This is an introduction to the internal workings of the two Oric machines. Graphics, sound, Rom, keyboard reading and more are dealt with, and several routines to be used with Basic (such as a *Trace* utility) are listed.

My fear is that possibly the book contains too much for the sake of clarity, and it lacks an index. However, for the Oric owner keen to use the machine to its full it is probably worth investigating.

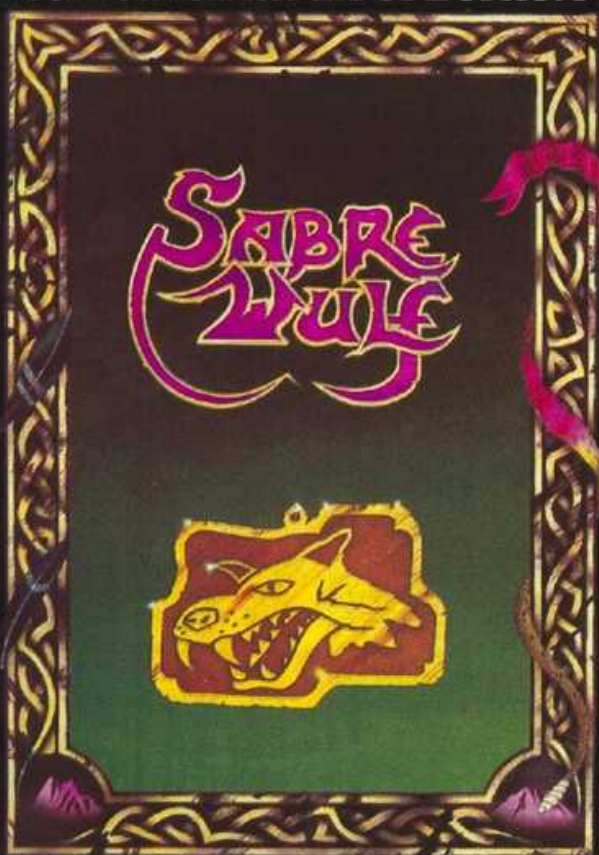
John Minson

48K SINCLAIR ZX SPECTRUM

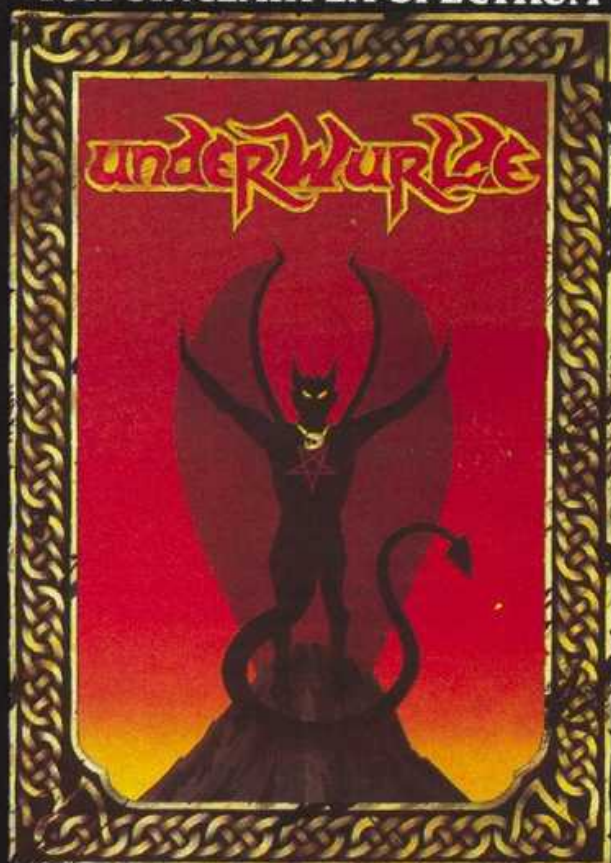


BBC MODEL B 1-2 OS

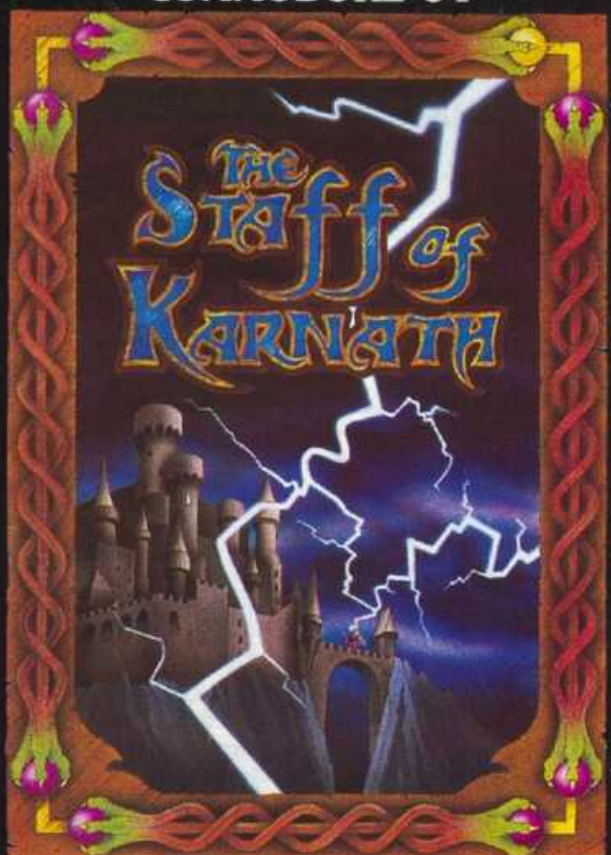
48K SINCLAIR ZX SPECTRUM



48K SINCLAIR ZX SPECTRUM



COMMODORE 64



"KNIGHTLORE", "UNDERWURLE", "SABRE WULF", and "STAFF OF KARNATH" recommended retail price £9.95 inc VAT. Available from W.H.SMITH, BOOTS, J.MENZIES, WOOLWORTHS and all good software retail outlets. Also available from ULTIMATE PLAY THE GAME, The Green, Ashby-de-la-Zouch, Leicestershire LE6 5JU (P&P are included) Tel: 0530 411485


```

250 IFPEEK(PF+V)=102THEN9000
255 IFPEEK(PE+U)=102THEN9020
260 IFPEEK(PF+V)=81THEN9010
265 IFPEEK(PE+U)=81THEN9030
270 PF=PF+V:PE=PE+U
280 POKEPF,81:POKEPF+0,2:POKE36874,241:POKE36874,0
285 POKEPE,81:POKEPE+0,4:POKE36876,137:POKE36876,0
350 GOTO150
9000 PRINT"UTUT TUT! FREDERICK YOU FELL INTO THE TROUGH YOU CUT AROUND YOUR"
9001 PRINT"LIVING ROOM.EDNA HAS SENTENCED YOU TO A LIFE OF WASHING UP"
9002 PRINT"COOKING AND IRONING!":GOTO9050
9010 PRINT"FREDERICK YOU WALKED INTO A DENSE MIST WHICH EMANATED FROM "
9011 PRINT"AN UNKNOWN SWEAT GLAND(YOURS OR THE MRS). THE INTENSE SMELL HAS"
9012 PRINT"MADE YOU UNCONSCIOUS! I DON'T THINK THERE'S MUCH HOPE FOR YOU NOW?"
9013 GOTO9050
9020 PRINT"EDNA YOU FELL INTO THE TROUGH FREDERICK CUT AROUND THE LIVING ROOM"
9021 PRINT"AND HAVE BROKEN A LEG.HOWEVER YOU WO'NT GET ANY HELP FROM "
9022 PRINT"FREDERICK-HE'S TOO WORRIED ABOUT HIS TROUGH":GOTO9050
9030 PRINT"OH DEAR ARMPIT GAS! BUT EDNA OVER THE THE YEARS YOU HAVE"
9031 PRINT"DEVELOPED A NATURAL RESISTANCE TO IT SO YOU ARE ALL RIGHT"
9032 PRINT"PERHAPS YOU'LL TAKE PITY ON FREDERICK WHENHE SEES 'JAWS III'"
9033 PRINT"AND YOUR LIVING ROOM BECOMES THE DEEP SEA WORLD LAGOON?!!!"
9050 PRINT"§ ANOTHER GAME (Y/Y)"
9060 GETA$:IF A$="Y"THEN10
9070 POKE36879,INT(RND(1)*255):POKE36876,INT(RND(1)*255):POKE36876,0
9080 GOTO9060

```

Fred
by H Dunn

The Music Box



A-to-D

A number of people are interested in whether you can interface an ordinary electric guitar with a computer. This is quite a tricky one and the answer applies to all instruments apart from those keyboards and drum machines equipped with MIDI standard interfaces or something similar — for which interfacing is easy.

A word of explanation is in order — MIDI is a serial interface (like the RS232 printer and peripheral interface) in which digital data is passed between synths or between a synth and a micro according to certain communication protocols set down by the synth manufactu-

rers who introduced the system.

The important thing is that all MIDI data is *digital* — which is why it's available only for those instruments whose internal electronics is *already* digital. The computer in a MIDI system doesn't store sounds, but only the information required for a synth to produce them.

Unfortunately, most musical instruments (even the electronic ones) do not use digital data in the creation of their sounds. So, in order to use a computer with them, their sounds have first to be digitised. This is done using a device known as an analogue-to-digital converter (or ADC) and, regrettably, ADCs good enough for audio use are not cheap.

Now, the BBC Model B has a built-in ADC, I hear you say, and so it has. But the BBC's ADC has a maximum sampling rate of 100 Hz (that's to say, it takes samples of the voltage being fed into it once every hundredth of a second — or, as the manual has it, once every 10

milliseconds). The result is returned in the BBC's *Adval* variable. Considering that the range of audible frequencies is roughly 30 to 15 KHz, the BBC's sampling rate is a mite slow!

The other popular computer with ADC facilities is the Commodore 64, whose SID chip contains a register returning digital values for an analogue signal on the *Pot X* and *Pot Y* inputs in the control ports. Like the BBC's ADC, this is intended for use with paddle or joystick controllers and is not good enough for direct conversion of audio.

If you want to experiment, however, the output of your guitar pick-up will need to be amplified. The BBC's ADC requires an input between 0 and 1.8 volts, while the 64's has to be between 0 and 5 volts. Suitable supply voltages for the necessary circuitry are available from the relevant sockets on each computer. It should be born in mind also that storing digital conversions can be very costly on memory.

One final point is that the Commodore allows you to treat audio output using the SID's digital filter. The input is on the Audio/Video Din socket on the back of the computer. The *Programmer's Reference Guide* gives all the necessary information on this facility and on the ADC.

Although A-to-D conversion is a problem, all is not lost. Several computers have peripherals available now at relatively low cost which allow you to sample-and-store sounds which can then be played using a keyboard.

Gary Herman

The Music Box is a new weekly column with news, reviews and readers comments on all aspects of micros and music.

Any readers with experience of computer music making or companies with new product news are invited to write to: drop a line explaining what they're doing to: Gary Herman, The Music Box, 12-13 Little Newport Street, London WC2R 3LD.

FEATURES

4 "SOUND" VOICES



MAX 256 COLOURS
ON SCREEN AT ONE TIME



DIAGNOSTIC "SELF TEST"



CASSETTE "SOUND TRACK"
CAPABILITIES



64K RAM



PROGRAMMABLE
JOY STICK PORTS



SPRITES



CARTRIDGE SLOT



MONITOR SOCKET



BUILT-IN "BASIC"



COMMUNICATIONS
CAPABILITIES



REAL KEYBOARD



SINCLAIR
SPECTRUM PLUS

ACORN
ELECTRON

COMMODORE
64

ATARI
800 XL



AT £169, LOOK HOW THE ATARI 800XL COCKS A SNOOK AT THE COMPETITION.

AT LAST, SERIOUS HOME COMPUTERS ARE UP AGAINST SERIOUS COMPETITION. THE ATARI 800XL OFFERS EVERYTHING COMPETITORS IN OUR PRICE RANGE OFFER. AND, AS YOU CAN SEE ON THE LEFT, A GREAT DEAL MORE. PLUS SOFTWARE PRICES THAT START AT LESS THAN £10.

 **ATARI 800XL**

FOR FURTHER DETAILS CONTACT YOUR NEAREST ATARI DEALER: ARGOS, BOOTS, CARREFOUR, CO-OP, CURRYS, DIXONS, GRANADA, LASKYS, LEWIS'S, LITTLEWOODS, MAKRO, RUMBELOWS, SILICA SHOP, SPECTRUM, VALLANCES, WIGFALLS, WOOLWORTHS AND ALL OTHER COMPUTER SHOPS.

YOUR OWN SOFTWARE BUSINESS

MANUAL
PLUS
CASSETTE

A COMPLETE PACKAGE

For less than the price of a games tape you could be on your way to earning money selling your own or other writers' programs. Our illustrated manual will show you how to set up your own full or part-time Software Business working at first from home. All practical and legal aspects are covered.

- ★ ADVERTISING
- ★ PRESENTATION
- ★ CONTRACTS
- ★ OUTLETS
- ★ RAISING CAPITAL
- ★ MARKETING
- ★ SIGNING WRITERS
- ★ TAX, N.I. ETC. ...

Analysing your advertising results is an important part of profit making so the package includes a special multi-part program to enable you to see at a glance how your business is doing! (Spectrum Only — Listing included for easy conversion to other micros)

MAKE A NEW START TO THE NEW YEAR!

ORDER NOW Get your package by sending £4.99p TODAY to:—

T.M.B.
MARKETING

15b KINGSWOOD RD, PRESTWICH, MANCHESTER M25 7AB



TOUCH-TYPE

FOR THE 48K Sinclair Spectrum

DO YOU YEARN TO DO SOMETHING USEFUL ON YOUR SPECTRUM?

Are you fed up with silly games? Make this the moment you take a step forward using your Spectrum into the world of "The Office of the Future!"

Learn to touch type on any QWERTY keyboard using the Spectrum as the teaching machine.

- ★ Full touch typing (no eyes down to the keyboard) from the first lesson.
- ★ Carefully designed lessons progress from key learning to speed practice at each stage.
- ★ Full ten finger touch typing with correct left and right shift key operation.
- ★ Learning psychology built in to the program to keep you motivated and interested in progressing.
- ★ Full feedback of performance — you know it is working — you are learning to type.
- ★ Learn at your own pace neither hurried nor restricted by other pupils.
- ★ Comprehensive instruction manual included with every cassette.

In this age of computers isn't it time YOU learned to type!

£8.95 inc p+p and VAT.

To: JCS SOFTWARE, 1 Paddocks Close, Cobham, Surrey, KT11 2BD. Tel: 0932 65354. O.K. I'm ready to step forward and improve my ability. Please rush me a copy of TOUCH-TYPE for the 48K Spectrum. I enclose a cheque for £8.95 (Please make cheques payable to JCS Software).

Name _____
Address _____

pcw11/22

TOUCH-TYPE TOUCH-TYPE TOUCH-TYPE TOUCH-TYPE for the Spectrum 48K.

The Illustrator is imminent

Now you can add graphics to your Quill Written Adventure.
For use in conjunction with The Quill Adventure Writing System on the 48K Spectrum.

£14.95



Send to;

GILSOFT
30 Hawthorn Road
Barry
South Glamorgan
CF6 8LE

Please rush me an order form and full details of The Illustrator for the 48K Spectrum.
I enclose a stamped addressed envelope.

Name

Address

Tony Bridge's Adventure Corner



Far and distant lands

The airways of the world have been really busy this week with readers of The Corner in far and distant lands, eager for enlightenment.

First out of the bag was a letter from Malcolm Schmidt, of Kelvin in South Africa. He wrote to me some weeks ago about *Zork I*, but has since solved the adventure. Thanks very much, Malcolm, for the detailed map on *Zork I* and *Planetfall*. I'm sorry that you haven't had much luck with The Corner, but please let me know about your experiences with *Enchanter*, which I'm sure you'll enjoy.

In the same post, The Grand Elf received a letter from Peter Craven of Blairgowrie, in the Transvaal, also in South Africa. Peter is a newcomer to our hobby and has just finished *The Hobbit*, with a score of 67.5, as well as *Inca Curse* and *Snowball*. As for *Planet of Death* — to get past the Forcefield (which, incidentally, is the problem that gives everybody a hard time!), *Fire Laser* twice (very unfair, this one, as there is really no clue at all) and then *Dance*, bearing in mind what you are hearing on the transistor.

You'll need the boots to wade into the lake (*Wear Boots, Go Lake*). Here you'll find a coin, and you may need this if you're thrown into jail. The gloves you'll need to open the door to the computer room. In *Urban Upstart*, give just the Lager to the football fan — you'll need the fiver to get into the airport. The Small Key will, indeed, start the plane, but to fly it, you'll first need to

learn how to! Try Reading the Book!

Peter also asks: "There must be other magazines worth buying that have adventure reviews and give help to lost travellers like me. Can you recommend any?" I certainly can, Peter: since The Grand Elf started the Adventure Corner some 18 months ago, most computer magazines have a page devoted to this rapidly-growing pastime. Most of them are pretty awful, but Keith Campbell's column in *Video and Computer Games Monthly* is one that I always read with great interest, as is the weekly page in *Personal Computer News*, written by the Gerrard Brothers and Bob Chappell among others.

I mention these in the cause of impartiality, as the one that I would recommend to you is our sister magazine, *Micro Adventurer* which, as its name suggests, is devoted to adventures.

A bit closer to home is Noordwijkerhout, in The Netherlands. This is where Mr P Woodhouse lives, and he writes asking for some advice in a couple of well-loved adventures. "How do I pass the Troll without losing one of my treasures? And, in *Magic Mountain* (by Phipps Associates), how do I cross the Chasm?" To pass the Troll without paying, you must, first of all, acquire the Golden Eggs — then go to the SW side of the chasm. When you try to cross, the Troll will stop you, and you will then throw the Eggs to the Troll. To get back, you must have the Bear with you (make friends with him first!) and then throw him at the Troll. As for the Chasm in *Magic Mountain*, first of all, get the Stick, which can then be used to *Reach Rope*. With this, you can *Swing Across*.

Back now in Britain, Mr J Jenkins of Bicester writes: "My son is having trouble in an adventure called *Espionage Island*, by Artic Computing. His problem is getting past the first task, parachuting from the plane. From what I have observed in magazines such as yours, it would appear to be not so much the instruction but rather the way it is phrased."

Yes, Mr Jenkins, this can be the most frustrating part of adventuring. Personally, I think that the puzzle should be the difficult part of an adventure.

As to the problem: To get out of the Plane, first *Get Parachute*. Then *Wear Parachute*, *Pull Lever* (to open the door), *Pull Cord* and

finally *Unstrap* (or *Drop*) *Parachute*.

Now, to the Beeb. Phil Rimmer has a Bee in his Beeb about this, and says: "Please don't forget that the BBC users also enjoy adventure — let's have a few more BBC adventures on your page." I know, Phil, that

Snowball



Level 9 Computing

Beeb-users are avid adventurers — they have some of the best available such as *Castle of Riddles*, which is one of the adventures giving Phil a problem. "How do I get out of the Black Maze?" Once in the Maze, *Wave the Black Rod* — this will give a puff of coloured smoke. If you move so that the smoke is coloured according to the colours of the rainbow.

Now to the adventure from Channel 8, *Escape from Pulsar 7*. Phil is stuck in the very opening: "I can't get out of the first three rooms — how many objects are hidden in these rooms?" This adventure starts off in a Social Room, in which is a couch. On the couch are a Note and Key, and moving the couch reveals a Rod.

Moving objects in many adventures, particularly Channel 8's, will often uncover useful items. Proceeding South into a Cabin, *Close the Door*, which uncovers a Pillow on a Bunk. Go to the Bunk and move the Pillow, thus finding another object — now return to the Social Room and *Go West* to the Bedroom. Go to the Bunk, *Examine Bunk* to find an air vent, which is your route to other parts of the adventure.

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

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!

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.

HERE'S WHAT YOU'VE SAID.....

"The standard of the programme is far, far better than we were expecting" ALAN DAIRE.

"Eureka! is superb. It's marvellous to have computer software of such high standard from Ian Livingstone"
CAROLE SKAIFE.

"It's taken over my life – I only have three hours sleep a night. I hated adventure games before this but Eureka! is brilliant!" ANONYMOUS CALLER.

"Congratulations on producing such an entertaining and stimulating package" J. GOODENOUGH.

"I would like to thank all involved for making such an interesting game, especially the riddles"
NORMAN SCOTTER.

"Please, give me a clue to the £25,000"
CHARLES COOPER.
(Sorry, Charles)

"I hate this game. I seem to be missing all my favourite TV shows" ADAM BOWLES. (*Poor old Adam*)

Eureka!

TELL US WHAT YOU THINK.



Word processing

John Martin of Nicosia, Cyprus, writes:

Q I am a regular reader of *PCW*, which is always available here in Cyprus, but at twice the UK price, and always look forward to your column.

Could you please tell me which would be the best Wordprocessor program for my Spectrum 48K, as I want to use it with my printer for letter writing, etc. So far I've heard of only two *Spectext* and *Tasword II*, but I'm sure you'll know of many more.

A You don't mention if you have microdrives on your machine, if you don't have them and you are thinking of buying them at some point, then my advice would be to get the new *Wafadrive* from Robotronics, which enables the use of their excellent word processing program (probably the best I've seen on a Spectrum).

If that is too expensive, then *Tasword II*, which I have used, is an extremely useful program, and at the price represents good value for money. I have not used *Spectext* myself, but have not heard of any major problems with it.

More ram

P Brown of Great Dunmow, Essex, writes

Q Is there any reason why it would be impossible to increase the Ram of a 48K Spectrum by adding one of the advertised 32K add-on rampacks?

A There is absolutely no reason why you cannot add an extra 32K to a 48K Spectrum. The problems start when you try and use the extra memory. The Z80 is only capable of addressing 64K of memory; ie, the 16K in Rom and the 48K in Ram. Without the use of some form of memory switching technique, any memory in addition to this 64K maximum is completely wasted.

Also, any software that you wrote to utilise the extra memory (were you able to use it) would not be really marketable, and would also require special Loading and Saving techniques. I suspect that by now you are beginning to appreciate why there has not been a flood of people buying these Ram extensions!

Program problem

Peter Hills of Bulls, New Zealand, writes:

Q I am a Spectrum 48K owner having a problem with just one program — *Football Manager* by Addictive Games.

All the other programs in my library give no trouble at all. But with *Football Manager*, right at the beginning before the first match highlights are played, it stops with a 'Nonsense in Basic Line 6560' error message.

I will mention at this point that the tape will load and play perfectly on my friend's Spectrum using my tape recorder or theirs.

Listing line 6560 shows that on my machine instead of having LET a(1) — etc, I get LET a(1.?????) — etc. The spurious full stop and five question marks are impossible to remove. They can be edited out, but will reappear when the program is Run again. Do you have any thoughts on what is causing the problem?

A This is, unfortunately, quite a common problem with the Spectrum. It seems that certain cassette tapes will always cause trouble on a particular machine, whilst loading perfectly well on another.

In your case the solution to your problem is quite straight-

forward. The facility exists in *Football Manager* to Save a new version of the game, so as to continue your meteoric rise to First Division fame and glory. All you need to do is to Run the program, obtain the famous error, correct it and carry on playing until you get the opportunity to Save the game.

At that point you should save your current position (which also saves a new version of F.M. for you), on to a blank cassette.

If you find that you cannot get the program to restart, after correcting the error, try *Coto* 6560. That should solve everything. If my advice doesn't work, please write to me again, enclosing a listing (if possible) of the affected part of the program, so that I can check it with my version.

Screen load

N Blow of London writes:

Q I am writing a program with a loading screen, and I want to save the whole thing; ie, loading screen plus main program. Could you tell me how to do this, so that it loads the screen, then the program and then runs?

A There are many ways of achieving what you want, the easiest is the use of a 'Loader' program. An example is show below. The main idea behind the loader program is to control the loading of all other software into the computer for one program. For instance, a program which requires a loading screen, a main Basic program, and a set of machine code subroutines. On machines like the CBM 64 this technique is called Bootstrapping. The loader program example I have given is for the Spectrum.

```
10 REM Loader Program
20 CLS: BORDER 4: REM clear screen and set border colour
30 LOAD "" SCREEN$:REM load screen
```

40 LOAD "": REM load main BASIC program

The main Basic program is saved so as to auto run, by using the Save "fred" Line start-line, format of the Spectrum Save command.

Array sum

J Holmes of Glasgow, writes:

Q Can you help me with a CBM 64 Basic problem?
10 DIM S(12):DIM TP(12)
20 FOR T = 1 TO 12
30 ?CHR\$(147)
40 INPUT "Salary for month";S(T)
50 INPUT "Tax paid this month";TP(T)
60 NEXT T

How do I find the sum of all the TP and S arrays? Do I have to do:

AS = S(1) + S(2) + S(3) + S(4) + S(5) + S(6) + S(7) + S(8) + S(9) + S(10) + S(11) + S(12) etc, or is there another way?

A This following gives you the sum of both arrays (in AS and AT), which you could then print at the end of your For loop.

```
15 AS = 0:AT = 0
45 AS = AS+S(T)
55 AT = AT+TP(T)
```

Pools prog

P Edwards of Mid Glamorgan, writes:

Q Please would you let me know whether it is worth doing the pools from a computer, as I have a program and the most score draws it will find is between four and five a week. As I own a CBM 64 your comments would be most welcome.

A I used to do the pools regularly, and my weekly score draw average was between 0 and three, so your program easily beats me. Seriously, though, with something as random as score draw selection, a computer is not going to be a great help.

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*

CLASSIFIED

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

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

GAMES SOFTWARE

ONSPEC SOFTWARE FOR THE 48K SPECTRUM ONE MAN AND HIS JOB

A multi-screen arcade game with a touch of strategy. Guide the intrepid traveler through the many screens of animated fun completing the various tasks.

Fully animated 100% machine code with colour and sound. Kempston joystick compatible. Just £3.99 (Please make cheques payable to J. A. Davis). From:

ONSPEC SOFTWARE
1 Jubilee Crescent, Middle Rd.,
Thrupp, Stroud, Glos. GL5 2DP.

DODGE EM! try to survive driving around the minefield. For any 48K Spectrum £3.00. From J. Kane, 9 Kintyre Gardens, Kirkintilloch G66 2PJ, Scotland

SUPERPOWER

An entirely new strategic War Game for the SPECTRUM 48K. Just £5.50 inc. From:

HOWARD MARKETING (AD. 1)
PO Box 21, FELIXSTOWE, SUFFOLK IP11 7LJ

COMPUTERS & SOFTWARE

Sinclair QL	390.00	Microdrive	47.00
Spectrum Plus + 6 pack software	174.00	Kempston Joystick Interface	12.00
Spectrum 48K + 6 pack software	124.00	Amstrad CP464 Colour	340.00
Expansion System	99.00	Amstrad GT464 Green	232.00
Interface 1	47.00	DMP-1 Printer Amstrad	190.00
		DDI-1 Disk	191.00

We have a large range of software for:
Spectrum 48K 270 titles
BBC B 240 titles
Electron 95 titles

All categories catered for: Arcade, Adventure, Strategy, Utilities, Home/Business and Educational.

SPECTRUM	COMMODORE 64	BBC B
EUREKA 13.00	PORT APOCALYPSE 8.50	FRANK 7.75
GHOSTBUSTERS 6.50	JET SET WILLY 6.10	ELITE 13.00
TIRINAWOG 8.50	GHOSTBUSTERS 8.50	MANIC MINER 6.20
UNDERWORLD 8.50	EUREKA 13.00	M.R.E.E 5.90
ELECTRON	AMSTRAD	ATARI
HUNCHBACK 6.00	MANIC MINER 7.50	BRUCELEE 12.95
ELITE 11.25	HUNCHBACK 7.50	FLAK 18.00
BLAGGER 6.50	CODENAME MAT 7.50	ZAXXON 12.95
CHUCKIE EGG 6.50	ROLAND IN TIME 7.50	SNOKIE 8.00

Write or phone for free catalogue (state micro). P & P free on all items. Cheques to:

MICRO COMPUTER WORLD
1 Lane Close, London NW2 6QZ. 01-452 0893
Please phone for availability of hundreds of other titles.
ACCESS TAKEN

ZOOMSOFT THE LATEST SOFTWARE FOR THE ATARI AND COMMODORE 64

Commodore 64	case	disk
The Sorcerer of Claymorgue Castle	9.95	13.95
Zork I	N/A	11.95
Zork II	N/A	11.95
Starcross	N/A	11.95
Deadline	N/A	11.95
Boulder Dash	8.95	10.95
Bristles	8.95	10.95
Atari 400/500/XL's		
Oil's well	N/A	21.55
Flight Simulator	N/A	37.95
S.A.M. (talkie)	N/A	41.95
Fort Apocalypse	9.95	14.95
Lode Runner	N/A	24.95
The Sorcerer of Claymorgue Castle	9.95	17.95

Plus 100's more titles available.
Send S.A.E. for free catalogue or telephone
01-723 0562 (10am-7pm)

Please state make of computer.
Send cheques, P.O. to Zoomsoft
46, Huntsworth News, London NW1 5DB

XMAS SPECIALS

(Order Before 15 January)

Football Manager	Spec £5.50
Micro Olympics	Spec £4.60
Chickie Egg	Spec £5.50
Scrabble	Spec £14.00
Football Manager	CBM £6.20
Micro Olympics	CBM £4.60
Twin Kingdom Vail	CBM £7.20
Chickie Egg	CBM £5.80

Cheques P.O.s
Computer Communication UK Ltd
9, Martins Close, Blackwater,
Camberley, Surrey GU17 0AH

DISCOUNT GAMES

From only £1.95

Spec., Comm 64, Vic 20,
BBC, Dragon
Send S.A.E. for free lists
M & S SUPPLIES
4 Cynthia Drive,
Marple SK6 7BB

SOFTWARE BARGAINS!!

COMMODORE 64	ZX SPECTRUM
Daily Thompson £5.50	D.T. £4.90
Zaxxon £7.90	Manic Miner £4.50
Block Hawk £5.50	Black Crystal £5.90
3D Time Track £4.50	Football Manager £5.25
Hunchback £4.90	Jetset Willy £4.50

Send S.A.E. for full list (originals). State which micro (mail order only).

P.O. cheques to:

M.C.S. (U.K.) LTD.

Dept. (PCW)

24 Edward Road, London E17 8LU

UTILITIES

1541 DISK USERS

Have you ever lost a vital file or program, now without any programming knowledge you can recover any scratched programs. Single key operation + 4 FREE utilities.

ONLY £6.99 inc P.P.

ALSO S/S BULK DISKS, £15.00 for 10 + 70p p+p.

WORLD'S LEADING BRAND

LOST 'N' FOUND SOFTWARE

17 Pitfield Street, London N1

Call Alan on 01-608 0136

MICRODRIVE ONE (MD1)

AT LAST 48k Spectrum owners with m/drives, discs, etc. can now transfer the MAJORITY of their tape programs (inc headerless, 48k programs those with LOW addresses - say 16384) and get them running.

MD1 has 5 programs to help YOU convert them so that they run (2 house-keeping progs), FULL manual and prog examples.

To transfer basic, code, or arrays to the drive use our mini tape 6MS program at £3.

Cost £6.50 inc p/p (disc owners etc ask for MD1X).

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

ALL WITH MONEY BACK GUARANTEE

LEARN, DEPT WE1

10 Brunswick Gardens

Corby, Northants

VIKING SOFTWARE

programs for the

AMSTRAD CPC 464

WORD PROCESSOR — Includes Justify, Wordwrap, Blocks, Margins, Tabs, Help Screen etc. etc. £7.95

CARD INDEX — Card Index Filing System — User Definable Records, Search/Sort/Find on up to 10 Fields £5.95

+ PRINT FACILITY

More home and utility packages currently under development. Watch for details.

Send cheques or P.O.s ONLY to

VIKING SOFTWARE, 10 Russell Street,

York.

ROYBOT ASSEMBLER & machine

code DEBUGGER for 48k Spectrum

New style menu driven ASSEMBLER and easy to use TESTER with DIS-ASSEMBLER. TRACE SINGLE STEP. BREAKPOINT. NON-STOP CALLS & HISTORY. Dynamic displays instruction, registers, stack, flags, selected memory. Decimal and hex, printer and microdrive.

Unique CONVERSATIONAL INSTRUCTION INPUT ASSEMBLE, EXECUTION and RESULT DISPLAY.

Microdrive cartridge £13.95. Tape £9.95 with full instructions and demo programs.

PCW Review 8 November

ROYBOT-PW, 45 Hullbridge Road,

Rayleigh, Essex SS6 9NL. Send sae for details.

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.

VIC-20 owners - want a free game? 25 different games going free! Send SAE to FGO, Adrian Mardlin, 23 Fairmile, Aylesbury, Bucks HP21 7SS. Now! Tel: 0296 24813.

GREAT SAVINGS ON MAIL ORDER SOFTWARE SPECTRUM

SE-KAA of Asiah 2.99 Volcanic Dungeon 2.99
Wrath of Magra 11.99 Black Crystal 3.99

VIC 20

Games Designer, write your own games 9.99

BEAU JOLLY VALUE PACKS

CBM 64 6 Games 14.99 Spec 48K 14.99
Any Spec 4 games 9.99 Vic20 14.99
From as little as £1.50 dozens of other titles available for:

CBM 64, Spectrum,
VIC 20, BBC, Dragon

SAE for full price list P.O.'s/Cheques to

BTB SOFTWARE
166 BUCHANAN STREET
GLASGOW

TEXAS EXTENDED BASIC: Our new range of extended Basic programs is now available.

Please send S.A.E. for
further details

We also have programs for
Memotech and Aquarius.

SOLWAY SOFTWARE,
6, CURZON ST.,
MARYPORT,
CUMBRIA
CA15 6LL

HOME ACCOUNTS. Put your house in order! Comprehensive coverage of bank accounts, credit cards, HP, etc. Inbuilt accuracy check. Projects cash-flow for any period. Available for CBM64, Vic20, BBC & Electron £8.45. Free details from Discus Software, Freepost, Windmill Hill, Brixham, TQ5 9BR. Tel: 080 45 55532.

TATUNG-EINSTEIN

Peach pack provides an integrated suite of programs for routine office tasks, simple, fast, powerful —

Mail 400 names and addresses
Writer 50 screen pages of text
Label 70 different types possible
Record 50 transactions, invoices, etc.

About 20 files can be held on each disc and all files are quickly and easily accessed by all programs. £25.00 inc. V.A.T. for complete suite, excellent value.

Detailed descriptions on request from:
PEACH COMPUTERS LTD.
192 Greenock Road
Largs, Ayrshire KA30 8SB
Tel: (0475) 673756

DUPLICATION

its 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. its 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, blanks. Blank cassettes. **FAST TURNAROUND 0869 252831 COMPETITIVE PRICES**
P.O., FREEPOST, 40 WESTEND, LAMINGTON, OXON OX4 9JZ

"DATATAPE" 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.

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

HARDWARE

SAVE £££'s!!

Amazing prices on Spectrum, Q.L., Commodore, BBC, Monitors, Printers, etc.

E.g. Q.L. £379.00
(inc. p+p. VAT)
48 HRS for less! Delivery

Dove Communications
Tel: 0621 891715

T-SHIRTS

QUALITY SOFTWARE that won't run!!
T-shirts and sweatshirts printed by "Copicat", 18 Beechwood Mount, Leeds LS4 2NQ. Tel: (0532) 784069

AMSTRAD

THE AMSTRAD PROGRAMMERS NOTEBOOK. Packed with programs, hints and tips for your AMSTRAD CPC64. An absolute must for all AMSTRAD users. Only £8.95 inclusive. Send cheque or P/O to PATONS COMPUTER SERVICES, 178, TODMORDEN ROAD, BURNLEY, LANC. BB11 3EU.

CHARACTER DEFINER

Speed up your programming — SAVES DATA TO TAPE + LISTABLE USER PROGRAM (guaranteed)

FOR

AMSTRAD 64

HMI Software Services
Black Cat
A1 Roxton
Bedford MK433DT £3.99
INC

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 knight-hood 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!

WAPTON VILLAGE RACE

An entertaining adult adventure for
AMSTRAD CPC 464

£5.50 From

DT Software, 53 Northumberland Crescent, Southend-on-Sea SS 12XB
(Special offer for one month only. Includes SKELETON PROGRAM for creating your own adventures)

COURSES

COMPUTER WORKSHOP

PRACTICAL COURSES
Beginners, Business, Hobbyists.
One Day £25 — Hourly £4

Enquiries: Tel:
01-778 9080

★ COMPUTER COURSES ★

Software and Hardware

We offer courses to suit all computer interests, from the complete beginner to the degree level student. The courses are all informal and tailored to YOU.

Send for full details to:
Jaysoft Micro Developments,
Black Adder Bank,
Green Law,
Berwickshire.
Tel: 036-16-458

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, Poynton, Cheshire, Cheshire, Haywards Heath, Sussex RH16 3DH.

QL SOFTWARE

QL PAINTBOX

Complete drawing package for your Q.L. QL PAINTBOX will save your pictures as a screen, datafile or it will even compile a superbASIC program from your picture. Includes full save/load/delete facility. Only £9.50 or £14.50 if you send your own cartridge. Price includes P+P+manual.

J + D SOFTWARE
3 Alfred Road, Linton, Warrington

YOUR Q.L. listings/documents printed. £2.00 per file any length, inc. p+p. Send tape, remittance to: Q.L. Print, Chubb's Cottage, Buddle Lane, Hatherleigh, Devon EX20 3HX.

QL CLUBS

Why pay £8.50 for Q.L. utilities when you can join I.Q.L.U.G. (Independent Q.L. user group). And get them free from our library?

Contact: **Brian Payne**
24, Oxford St.
Stoney
Stratford,
Milton Keynes,
Bucks.



Book
your
Classified
or
Semi-display
advert by
Credit
Card

Call
Diane
Davis
on
01-437 4343

BARCLAYCARD

VISA

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.

WANTED

Contract programmers required for a wide variety of work. A full agency service is offered and top fees are paid. Please send details of experience and other relevant information to: S.O.S., P.O. Box No. 138, London E1 9PW.

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.



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.

THIS SPACE FOR SALE

£18

TELEPHONE:
PCW CLASSIFIED
01-437 4343 Ext 206

FOR SALE

CBM 64, C2N cass., 1541 disk, approx. £500 s/ware (cass. and disk), manuals, leads, books etc. All boxed, little used £500. (will consider swap for BBC 'B'). Tel: 0525 377094.

BBC B 1.2 O/S with disk interface + 14" medium res microvitec colour monitor + computer desk. All + 10 games and 3 blank discs + several manuals. £650. Tel: Guildford 64503.

48K SPECTRUM plus £60 software plus joystick and interface £140. Tel: 01-952 8381.

ACORN ELECTRON with data recorder, mains adapter, all leads, instructions and extra software. Still under guarantee, as new £190. Tel: 01-359 9016 (Islington), evenings.

ACORNELECTRON + software £150. Atari joysticks, Rd Tracer (Spectrum), DKTronics light pen very cheap. Tel: Dave G.X. (0753) 888474.

VIC-20 + cassette 16K expansion, super expander machine code and games cartridges 20+ original games books, joystick, asking £150 ono. Phone: (051) 424 1326.

SHARP MZ 80K. Single disc drive, sharp dot matrix printer, excellent condition, many programs. Cost £1500, new. Offers, phone daytime 0625 531534, Mr Franks.

COMMODORE 64 + C2n cassette unit + joystick, mags, Adman speech synthesiser, 34 original games inc: Valhalla, Quo Vadis, Loco, Manic miner, etc. worth over £600 will sell for £350 ono. Phone: Godstone (0883) 843777 after 6pm.

SELLING OR BUYING a used computer/equipment in London and the home-counties? The Computer can help you! Tel: 0375 642434 (anytime).

48K SPECTRUM books, mags, tape recorder, £200. Original s/w. Tel: Colwyn Bay 31783. After 4pm.
SPECTRUM S/W all original inc: TransAm, Jet Pac, Hungry Horace. Pole and many more £2.00 each inc. postage. Tel: Tatsfield 812.

FOR SALE Spectrum s/w. Inc: Sabre Wolf £8.00, Jetset Willy £4, Airliner £6, Gobble a Ghost £4, Road Runner £4, Lunar Jetman £4, Blue Thunder £4. Tel: 041-881 6450. Ask for Campbell



JACK IN MAGICLAND

48K ZX SPECTRUM £6.95

An educational adventure for for 7-12 years. Features descriptive and atmospheric locations, large vocabulary, save routine, full notes and book of cartoon illustrations.

From:

TURTLE SOFTWARE
40 School Road, Finstock,
Oxford.
Tel: (099386) 249

Christmas Bargains

QL £375, Spectrum £120, Spectrum + £170, BBC B £380, Electron £190, Goldstar MSX £220, Sanyo MBC-550 £725, MBC-555 £940, CBM 64 £185, CBM 1541 Disk £210, CBM Data Recorder £40.00, Sinclair Expansion Pack £95, Microdrive/Interface £47, QL Monitor £260.

Printers: Riteman £250, Olivetti JP101 £200, Cannon JP 1080A.

Cheque/P.O. to:

AHMEDI INTERNATIONAL
Unit 1, 9 Winchester Street,
London W3 8PA

Phone for additional offers: 01-992 1362
Delivery 7-10 days subject to availability

Computer Swap 01-437 4343

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

Spectrums for Sale

SPECTRUM SOFTWARE for sale. all originals. New titles, Jasper, Astronut, Tir Na Nog, Underworld + many others. Phone: Christopher (0234) 60724.

ORIGINAL SPECTRUM keyboard. Used only for one week. Exc. Cond. £8. Tel: 061-620 2598

SPECTRUM SOFTWARE Trader, Traxx, 3D-Tanx, Chequered flag, Pinball Wizard, Zoom, Ghost Hunt, Football Manager, Full Throttle, Cricket Captain, Timegate, Handicap Golf. All £2.45 each. Andrew Storey 162 Orton Rd, Carlisle, Cumbria.

ZX SPECTRUM 48k + £100 worth of software + Kempston joystick all boxed. Worth £250 but selling for £150. For more details Tel: Ramsey (0487) 840968 Evenings only.

48K SPECTRUM Interface 1, Microdrive, Kempston joystick + s/w. £180. Tel: 061-432 4631.

SPECTRUM PRINTER for sale. Excellent condition only used four times. Four rolls of paper plus Taswork cassette. Phone: Tottington 6654 after 5pm. Ask for Steven. Only £30. Will negotiate.

SPECTRUM SOFTWARE for sale including River Raid, War of the Worlds, Kokotoni Will, Cosmic Kanga, Horace Games, Sherlock, Psytron, Ugh, Monkey Bizness, Alchemist, all originals. Ring Philip (0909) 477189

48K SPECTRUM and Sinclair printer. Also £100 worth of software including 3D Ant Attack and Scrabble. Will sell for £200 inclusive ono. Tel Burgess Hill 2760 after 6pm.

DKTRONICS Spectrum keyboard. Never used. Still boxed. 3 months old. £35. Tel: Chesterfield 810922 6pm-9pm. Ask for Anthony. Address: 17 Barborough Road, Clowns, Nr. Chesterfield, Derbyshire, S43 4RA. Must collect.

48K SPECTRUM Alphacom 32 printer. All fully boxed. Plus load of game. All original. £150. Tel: 01-785 9018.

48K SPECTRUM tape recorder, Alphacom printer, over £100 of original software everything in excellent condition, cost over £330, sell for only £200. Tel: 01-449 1571, Ask for Jeremy.

48K SPECTRUM interface 1, microdrive Alphacom printer & paper DKTronics programmable joystick interface (all boxed). Also Quickshot II, joystick, books, magazines, software microdrive cartridges and blank cassettes. Only £325. Tel: 041 771 8638

SPECTRUM SOFTWARE for sale. 25 recent originals going from 50p to £4.50 T.L.L., Tank duel, Cavern, Fighter, Stonkers, Pl. Balled, Wheelie, Krakatoa, bargains galore. Ring Ali 274 2982, after 6 pm.

48K SPECTRUM with interface 1 + microdrive, joystick + programmable interface, CRL Fifth (extension to Basic) Transam and 3D Tunnel, total cost £280 + sell for £250 o.n.o. Phone (061) 881 5663, after 6 pm, (ask for Ahmad).

SPECTRUM SOFTWARE all £2.00 each Arcadia, Ant Attack, Atic Atak, Alchemist, etc. Hobbit £5 as new plus Spectrum Books. Phone for titles and prices Tel: Liphook 722591 (Hants) after 5 pm (Geoff).

SPECTRUM SOFTWARE Blue thunder £4, Zaxxon £2.50, Ground Attack £2.50, Battle of Britain £2.50, Slippery Sid £3.00, Nightlife £2.00. Tel: Farn-down 897016 original only.

Commodores for Sale

VIC 20 + CASSETTE switchable Ram, joystick software, books + mags. £100. Tel: Minsterworth 403.

VIC 20, £40, C2N £20. 32K switchable Rampack £25, Quickshot joystick £5. 5 Commodore education packs £25. Plus s/w £30. Or £135 for the lot. Tel: Ken 01-764 1919.

CBM PRINTER MPS 801 £200. Boxed + guaranteed. Tel: Tunbridge Wells 22916.

16K, VIC 20, C2N, 100 of games. Over 20 mags, books. £100. Or swap for CBM 64 Tel: 01-987 6461 (day). Mrs Baxter 01-519 0716 (eves).

VIC 20 + £800 of all accessories. Original games only. 20K. £145. ono. Tel: 061-643 5858.

CBM 64, C2N Recorder, 2 joysticks. 32 original games. Inc: Hobbit, Manic Miner, International Soccer, Pipe Line, Dust Cover. Mags £300 ono. Tel: 0274 87658 after 5pm.

VIC 20 + **C2N** + 16K Ram, joystick adventure cartridge, Intro to Basic part I. Programmer Reference Guide, Dust Cover, £100. Tel: West Drayton 441004.

VIC 20, CASSETTE unit + 16K Ram £50 of original s/w. Kempston joystick, Learning Basic Part I. Tel: Stevenage (0438) 61913. £130.

CBM 64 SOFTWARE, Boogaboo, Aquanaut, Sheep in Space, Killer Watt, Space Pilot, Cybotron, Forbidden Forest, Blagger, Maziacs, Hobbit, China Miner, House Of Usher £3.50 each. Originals. Tel: 0630 57129 1pm-10pm.

CBM 64 S/W, Hobbit, Revenge MC, Odyssey, Armageddon, Music Composer, International Soccer, + £30's worth of mags. In all, worth almost £85. Will sell for £40. Tel: (0272) 660164.

VIC 20, CARTRIDGES Gorf, Chess, Radar Rat Race, cassettes Krazy Kong, Arcadia, Wacky Waiters, Gridrunner, Centipede, Skramble, all for £52.00 including post and packing. Mr McGhee, 139 Southfield Road, Blackwood, Lanarkshire.

CBM 64, 1541 disk drive, cassette unit, Quickshot II joystick, £300 worth software, books, magazines, 20 disks, disk box. Worth £750. Offers around £400. Tel: Richard on 0504 43305 after 6pm. Will deliver.

VIC 20, C2N, 16K switchable Ram five cartridges, £180 software inc Jetpac, Trader, Matrix, IBP + 1, books, mags, games (on tape) + colour TV game, five

cartridges boxed G.C., adaptor all £240!! 0292 45477.

VIC 20 + STARTER pack + C2N, + 32K Ram + joystick + Centronics interface + £160 original software + £20 of books + mags. All worth over £400. Will accept £180. Phone 01-807 1724.

CBM 64 + C2N + joystick + games, over 40 originals (games). Buyer must collect, ace condition all for £250. Ring Mark on 675110 Bristol.

CBM 64 GAMES FOR SALE. Manic Miner, Daley's Decathlon, Solo Flight, Quak Atak, Crazy Kong, Hover Bovver, Arabian Nights, and Chiller. Various prices or £30 the lot. Phone Cheslyn Hay 418340.

VIC-20, CASSETTE UNIT, 16k Ram-pack, super expander, Mikro assembler, adventure cartridge, 4 slot motherboard, plus various tapes and Vic Revealed. VGC £120 ono. Tel: Nottingham (0602) 204058 after 6pm.

ZAXXAN FOR CBM64 sell for £8.00 or swap for Black Forest Chateau. Tel: Saddleworth 2518 (Oldham) Also Aviator For BBC for sale £8.00 — 458 2518.

COMMODORE 64K + cover, C2N cassette recorder, TV, joystick, etc 14 games, still guaranteed, cost £400 new, will sell for £250 ono. Tel: Littlehampton 7222307 evening.

VIC 20 CARTRIDGES: progs Aid, CBM8K, £15 each. Intro to Basic Part Two £8 Roger Perriss 84 Lodge Land, Aston, Sheffield S31 0BP Tel: 0742 872343.

COMMODORE 64 software Ultisynth cost £15, sell for £10 (still new)

COMMODORE 64, disk drive, C2N, joysticks, computer desk and collection of original american software including Zork, Planetfall, Pole position, FSII etc. All for £400. Please call Alsager 78676 after 6pm.

VIC 20 + cassette unit, intro to basic PT1, software, books, £70 ono. Tel: Dartford (peww) 28600.

COMMODORE 64 programs for sale or exchange. Zim Sala Birn £3.00. Kokotoni Will £2.50. Channel 8's Circus £2.50. Many more cheap. All originals. Phone Rotherham 70149.

CBM 64 C2N cassette, w joysticks, reference guide, lots of s/w. £210 ono. Tel: Hassocks (07918) 3102.

CBM 64 SOFTWARE Sherlock, Quill £12 each. Zodiac, Pyramid, Monty Mole, Pitfall, Killer Watt £5 each. Snowball (no instructions), Hunchback £4 each. All originals. Phone David on 01-267 5035 evenings only.

VIC 20 Cassette player and 30 games, £75. 16k ram pack, £20. 3K ram pack, £5. Chess and Mission Impossible cartridges, £5 each. Tel: (0232) 619650 evenings.

VIC 20 + 16K switchable ram-pack, 70 gmes, joystick, cassette recorder, instructions to Basic Part I, dust cover, mags, books. £125 (0202) 511779

16K VIC 20 s/w, books, selling for £115. Under guarantee — Ring (0753) 32762 (Slough — eves).

COMMODORE 64 + C2N cassette + joysticks + paddles + books + software + cover. All worth over £300. All for £250 ono. vgc, still under guarantee. Tel: Horley (02934) 3922.

INTRODUCTION to Basic part I £7. Home office word processor £5. Programmers reference guide £5. CBM joystick £3. Games and adventures for sale, all originals. Tel: Reading 23653.

HONEYFOLD machine language cassette + book £5. Original games + adventures for sale Vic 20 revealed £3. Commodore Joystick £3. Super Expander £20. Tel: Reading 23653.

CBM 64 C2N cassette unit, joystick, software (including Mikro assembler, Ultisynth and Jeff Minter games) and

books. Worth over £460, sell £300. Tel: Pontefract (0977) 703796

CBM 64, recorder, Quickshot joystick, £60 of software including Flip Flop, Loco, Forbidden Forest, Hulk, all as new. Worth over £314, price £190. Tel: Thetford, Norfolk (0842) 62752 after 5.30 pm.

CBM PET 2001 8k, w/integral cassette, offers, 324 memory upgrade for pet range, will fit above £40.00 o.n.o. Tel: Tadley 3375.

S/W FOR VIC20 machine code monitor £15.00 o.n.o. Trash man cartridge £5. Tel: 021 784 2038.

COMMODORE 64 1541 disk drive, MPS 801, printer, C2N, cassettes, simons basic plus £600 worth of s/w on cassette and disk £700 o.n.o. or swap for BBC + disk drive. Tel: 042 672058 Simon

CBM 64 Books for sale: The Working CBM 64 £4.50, CBM Machine Code Master £5.50, CBM Program Book £4.00. All brand new. Kaktus £4.50. £3. Tel: Northwich 78475 after 4 pm.

VIC 20 16k switchable ram, five cartridges, joystick, I.B.P.+1, £180 of s/w books, mags, s/w includes Trader Jet-pack, Skyhawk, + colour TV game two joysticks, five cartridges, adaptor all boxed £200. Tel: 0292 45477.

VIC 20 Switchable ram pack and 8 cass, inc. Bongo, Jet pack, Computer War, Tower of Evil, Flight path, Skyhawk, Psycho Shopper and Zorgons Kingdom. Worth £90, sell for £55 o.n.o. Tel: 061 477 2716.

VIC 20 Switchable ram-pack, C2N cassette recorder, Spectravideo, joystick, around £200 worth of software including Snooker, Hell-gate, arcadia, £300 o.n.o. Tel: (061) 485 7852 after 5 pm on weekdays, all day Sunday.

16K VIC20, cassette unit, printer, utility and games cartridges, speed synthesizer 3-slot motherboard, books and cassettes only £230 — will separate. Tel: 01-310 4031 after 6 pm.

CBM 64 cassette + 1 cartridge (Lazapian) all boxed, only 6 months old, £160. Tel: 0623 7523 (Notts area).

LARGE AMOUNT of Vic 20 and CBM 64 software (all original) for sale. Please send SAE to John Keogh, 30 Highwood Avenue, London N128QP.

32K VIC 20 + datasette, inc. 16k switchable ram and super expander, speech synthesizer, software, books, assembler, joystick, intro basic 1 + 2, 14" b/w tv. All for £150 o.n.o. Tel: Whickham 488 1470.

VIC 20 with cassette deck, 8k stack store board with Vic kit 2, s/w inc: 2 cartridges & mags. Any offers; will separate. Tel: 051 722 3735.

PRINTER for CBM 64, Vic 20, Pet Commodore model 4022, hi-res printer, new £399, sell £150, or swap for good Sony/Technics Stereo (etc). Phone: 08833 6687 (Surrey).

CBM 64 software, original and half price, including Flip & Flop, Suicide Express, Aztec, Trollie Wallie, Snooker, Kong, Caesar, Jammin, Hexpert, Quasar, space Pilot. Phone: (03745) 58835.

VIC 20 C2N tape recorder, joystick, Computer 12 months old, wide selection to cassette and cartridge games. Contact Paul. All for £100. Tel: 01-462 6249.

Acorns for sale

BBC MODEL B with official Acorn DFS, Speech System and Prism Modem. Worth over £600, bargain at £470, with £300 worth of software. Tel: Kidderminster 4828 after 5pm.

BBC "B" COMPUTER with Cumana Disk Drive and 32K Solidisk sideways Ram. Plus software 5 months old. Little used. £575 Basingstoke 51623.

ACORN — BBC MODEL B, Basic 2 or 1.2. Acorn DFS. 100K Disk Drive. 32K Sideway Ram. 40 disk + s/w extras. £500. Tel: (0427) 872026 eves.

ACORN ELECTRON 5 months old. Any offers. Tel: 01-459 3278.

BBC B. 1.2 OS v.g.c. boxed manual, lead, s/w. £250. Tel: Paul 01-989 8449.

ACORN ELECTRON + BBC data recorder, s/w, Quick Shot II, joystick, all leads; mags + all boxed. £240. Tel: Percival 01-902 5036.

DISK DRIVE BBC Mitsubishi. 400K 40/80 Track. Switchable, single disk drive with over £1,000 worth of s/w on disk + tape all for £300 (05827) 69152.

DISK DRIVE BBC Cumana 800K dual drive with 48K switch and PSU, supplied with over £1,000 worth of s/w on disk, tape. All for £450 (05827) 69152.

BBC B. 1.2 OS official monochrome monitor and cassette player. All 9 months old. Very good condition. Still in boxes. Must sell fast. £400 ono. Phone 01-444 8349 between 4 & 5pm.

BBC/TORCH computer system. 3½ months old, NAC printer, monitor, Database, Accountant, Word processor + Cash Book programs + disks + paper £1200. Tel: Weston Supermare 813060.

Ataris for sale

ATARI 400 16K, 410 recorder, boxed as new. Offers invited. Tel: W. G. Davis 0432 267997.

ATARI 400, 16K software recorder 2 joysticks, books + manual s/w (cartridges, tapes) worth £200. Sell £130. Tel: 01-204 2539.

ATARI 600 16K. Boxed. Ideal for beginners. £65. Tel: 0621 891715.

ATARI DISK ROM + tapes to sell all originals, software + disks for £5. Roms £10. Tel: 0786 73599. Mr Crawford.

ATARI 600XL + cartridges + joystick + Programs book. All excellent condition. Boxed £180 ono. Swap 800XL. Tel: J. Gadehouse (0622) 47445.

ATARI 400 16k with recorder, joystick, books, inside Atari Basic, Games and recreations plus cassettes, £70. Tel: 01-906 5742 daytime.

ATARI 400 + Basic quick shot joystick 4-10 program recorder + lots of good quality s/w. Bargain at £170. Tel: Castletown (Caitness) 689.

ATARI VCS with joysticks paddles leads etc. 5 cartridges inc Berserk Astroids good condition £50 o.n.o. Tel: 01-960 0094 eves.

ATARI 800 410 program recorder, joystick, 4 cartridges, several tapes, manuals, excellent condition, not very old — £150. Tel: 021 783 2500.

ATARI 1020 colour plotter for sale at only £85 o.n.o. works with all Atari micros 20, 40, 80 columns text or graphics. Same paper and pens as Tandy/Oric plotter. Phone: 0903 42013.

ZX81s for sale

ZX81 S/W eg. Flight Simulator, Hopper and others at £2.50, all originals. Tel: 051 334 9696 after 5 pm.

ZX81 16K good condition + software including 3D Monster Mazes, Mazogs, Black Crystal, Asteroids, Etc. + old mags and one books. Bargain at £40. Tel: Seb on 4958 (Ware).

16K ZX81 for sale. The only ZX81 known which has 16k ram on-board, no ram pack wobble! £300 o.n.o. Also spectrum manuals £2.50. Write D. Scott, 26D Harden Place, Hawick, Roxburgh, Scotland TD9 7BY.

SINCLAIR ZX81 16k add on, keyboard add on plus games cassette £36 o.n.o. Tel: 01-223 4708, Mr Berry.

ZX81 S/W top games, all originals, less than ½ price. Ring: 01-337 9194. Private sale only.

Dragons for sale

DRAGON 32, six programs inc. Fruit Machine and Breakout, £3.50. Four utilities inc. Reset Disable and Auto-run, £2.75. Both for £5.50. Cheques to M. Britnell, 21 The Mead, Wallington, Surrey SM6 9OU.

DRAGON 32 BOXED leads and manual. Fully working. Cassette recorder joystick cartridge 10 cassettes incl. The King. Users handbook. Worth over £200 sell for £100 ono (0622) 45258 evenings only.

DRAGON 32 + S/W. books, 3 cartridges. Quickshot. £80. Tel: 01-998 2561.

DRAGON 32 SOFTWARE — Cruising, Talking Android Attack, Cave Fighter (Scramble), cost over £20 — sell for £10 also, the Working Dragon 32 Book — £3 and the Dragon Manual — £3 (0202) 577797.

DRAGON S/W. TELEWRITER £28. Toolkit £14.00 Creepy Ville, Ring of Darkness, many more + books. Tel: 0959 74133 (all originals).

DRAGON JOYSTICK. Dust cover, Ocean Assemble/Disassemble + books. All as new £140 o.n.o. Tel: Brian 01-888 8101, Woodgreen.

DRAGON 32 plus 2 joysticks, plus tape recorder, plus software £100 o.n.o. Tel: 0491 35849 (Oxfordshire).

DRAGON SOFTWARE 17 original tapes. Includes: The King, Space Shuttle, Cuthbert Jungle, Cuthbert Walkabout, 1 Cartridge (berserk) + 3 books. Total value £171 sell for £75. David McNeish, 10 Graham Avenue, East Kilbride, Glasgow. Tel: East Kilbride (03552) 20001.

DRAGON 64 with disk drive + joystick cassette, s/w, books, mags, v.g.c. £400. Tel: Farnborough (0252) 518 992 (eve).

Tandys for Sale

TANDY TRS 80 colour, 16K extended model, 4 original s/w leads, manual + 1 joystick. Sell £110, ono. Tel: Tunbridge (0732) 35 3642 eves.

TANDY CGP-115 colour, graphics printer + Dragon lead. Cost £167. Sell for £90. Tel: 01-360 3443.

AQUARIUS + CASSETTE player + all leads, manuals for sale £60.00 ono or swap for 16K Spectrum. Tel: Saddleworth 2518.

APPLE II 48k with manual Single Disk Drive + silent YRE Apple Printers + TV + video output hardly used. £679 ono. Tel: Worthing 200118 after 6pm.

1TT APPLE 48K computer Base in Rom. Colour Disk Drive + Panella Printer card. Roms. Apple s/w with Apple Writer. L/C etc: £320. Part Exchange Dragon 64. Tel: Ted 01-675 2959 (day).

Wanted

ACORN ELECTRON owners! I will pay you up to £6 for your original software. No BBC software. Tel: Cardiff (0222) 843587 for details. After 6pm. Ask for Jason.

SPECTRUM 48K AND loads of software, books, mags, programmable joystick. Swap for disc drive and the DFS for the BBC micro. Might sell phone 04868 6589 after 4.30pm.

EXPRESS SAILING dinghy with trailer sails + safety equipment. Valued at £800. Swap for £400 of used computer equipment. Tel: 01 550 3564 anytime.

SWAP VIC 20 starter pack plus games + books or unique 40 channel CB with extras for Spectrum 48K with extras. East Horsley (Surrey) 4205.

MICRONET PRESTEL for BBC 1.2. Acoustic coupler + s/w and all leads. £45. 01-864 8574.

SPECTRUM 16K, in need of repair + £70 of s/w all originals. For Atari 400 with Basic or Texas 71/994A with Super Expander. Tel: 01-531 1930.

WANTED BROKEN SPECTRUM for spares/experiments. Up to £20. Also ZX80 Rom disassembly and any interface 2 cartridges. Tel: Peter 051 630 2450 eves.

WANTED ZX81 to write + swap tips etc. Tel: Mark 0524 52920 for details. **£50 OF ORIGINAL** Spectrum s/w to exchange for Microspeech. Tel: 01 809 2841.

COMMODORE HIGH FLYER Business game urgently wanted on tape. ring Jim on 0902 893084. Anytime.

SWAP ELECTRONIC HAND held Space Invader game for Atari 600 XL software or Pole Position cartridge. Write to Dean (PCW), 268 Brooklands Road, Manchester, M23 9HD.

SWAP 40 CHANNEL CB radio + power supply + SWR + aerial and hand held CB for your CBM 64. Write to Dean (PCW), 268 Brooklands Road, Manchester, M23 9HD.

BASIC COMPILER WANTED urgently for Oric 48K. Willing to pay high price. Phone (0742) 304316 or write to: John Hayes, 24 Whitworth Road, Crosspool, Sheffield S10.

WANTED 48K SPECTRUM + real keyboard. No software paid 90£ cash + postage or 70£ + 20£ for separate units.

WANTED AMSTRAD concise Basic + Concise Firmware manuals. Software especially Devpac, Zen, Pascal also required. Phone 0422 75366.

WANTED ORIC 1 48K without s/w except utilities ie assembler etc. Price up to £60 ono. Write: N. Sandisin, 27 Dorset Road, Merton Park, London SW19 3EY. Local if poss.

WANTED AQUARIUS information tape recorder input output details printer interface details any information circuits must welcome Norman Waghorn 39 Cumberland Ave Broadstairs Kent.

WANTED REEL TO REEL tape recorder for 48K Spectrum + tapes send details of age, make, etc to Derek Scott, 26D, Harden Place, Hawick, Roxburghshire, Scotland TD9 7BY.

WANTED: ZX PRINTER will pay £10. Wanted: joystick will pay £4. Wanted: ZX microdrive and interface 1 will pay £26 telephone: Bristol (0272) 569599. **BBC B WITH Disk Drive** and Printer. Swap for Nikon F3 with 28mm. 3.5 lens. Also 80-200 300m 4.5 also Fotina Camera bag as new. Total £1,000. Tel: Mr Warner 01 529 5071.

WANTED: BBC B in good working order for approx: £200. Cash collection may be possible if in West Midlands. Tel: (0203) 303784

WANTED 16/48K SPECTRUM Will

swap for Vic 20 + C2N + Software including Arcadis, Vegas J'pot etc. + cash (£10). Tel: Chris on Burgh Heath (07373) 55591 or write 'Eastworth', Oatlands Rd, Burgh Heath, Tadworth, Surrey KT20 6BS.

WANTED Q-SAVE or other fastload-save program for ZX81. Tel: (0602) 399063 after 5pm.

WANTED MICROVITEC QL Monitor and Qume printer. Tel: Mendlesham 7130.

WILL SWAP MY ATARI 410 Tape recorder for a 1010 tape recorder plus £5.00 perfect condition boxed. Phone Wigan 53936 after 5pm.

WANTED: DISK DRIVE for CBM/PET computer. Dual or single drive required e.g. 2040, 3040, 4040 etc. Working model preferred but anything considered. Tel: Chester 675717.

SWAP CLASSICAL GUITAR Alhambra model, 9c and carrying case for Commodore 64 with extras or BBC Model B with cash adjustment. Tel: Evenings 01-363 3363.

SPECTRUM PEN PALS wanted all over the world. Girls + boys. Letters assured to all those who write. Colin Edwards, 33 Aroclene Road, London, SW2 2BQ England.

WANTED BBC Model B. Swap CBM 64 + C2N + 1520 Printer all under guarantee + book + joystick + software inc. Beach head Coloss/Chess F/Parol Hobbit Hunchback worth over £450 + other software + mags. Mike, phone Cardiff 594848.

WANTED OLD MICROS Jupiter Ace, sinclair MK14, UK101, ZX80 etc. etc. I won't make you rich, but I will give your loved ones a good home. Phone: 01-450 0214

WANTED CBM 64 with recorder. Offers to Matthew. Phone: 01-599 7989, after 6 pm.

SEIKOSHA GP 100 AS swap for parallel printer or BBC Roms. Tel: 01-241 2594.

BBC OR ELECTRON computer wanted! Also accessories. Must deliver. Tel: Sunderland 04856.

SWAP SUZUKI X 7 250 cc motorcycle, 10 months m.o.t. x-reg., taxed, top box, good condition. Tel: 01-998 6065, for a Amstrad CPC 464, or CBM 64 + Disk drive, Spectrum pws + w.h.y.

WANTED ZX81 out of order and keyboard not working. Tel: John 021 551 6427.

WANTED WORD PROCESSOR + other business and educational programs for ZX Spectrum. Good price paid. Write to Mr Alan, 28 Landsdown Road, 7 Kings, Ilford, Essex 193 8NE.

WANTED CMB 64 + cassette recorder, will swap for 48k spectrum with joystick + Kempston interface. Tel: 0642 484785 after 5 pm.

WANTED NON-WORKING COMPUTER prefer CBM64. Consider anything. Condition unimportant, must be cheap. Tel: Mick, Basildon-417861.

WANTED EPSON HX 20 with Accoustic coupler + communications software. Ask for Gary. Tel: 0942 57423, before 5pm.

SWAP PRISM MODEM for graphics rom. for Beeb, Braithwaite 441.

I WILL SWAP MY SPECTRUM Currah Microspeech with Currah Dictionary for a ZX printer with paper. Contact: Leeds 620206, ask for Paul (after 4 pm.)

WANTED MODEM to fit Dragon 64 RS232 socket acoustic or other type. Please ring with price and details 0422 247456. If wanted, have darkroom equipment colour, black/white to swap.

MICRODRIVE AND INTERFACE wanted. Furthermore, has any one out there got an OCP Assembler or M/C Toolkit? Phone: Eric on Portsmouth (9705) 370559.

SWAP PHILIPS V2000 Portable video system, 8 hour tape, 4 months old, best offer or Spectrum 48k + extras; or sell for £250. Tel: Macclesfield-21571.

WANTED M/C PROGRAMMER to convert Spectrum program currently on market to Amstrad, Vic20 etc. 45% of retail and mail sales paid. Write to: S. Johnson, 78 Nairn Street, Crookes, Sheffield S10 1UN.

WANTED TI-99/4A Expansion system; box RS232, 32k, disc; TI compatible printer, minimecopy, parsec, and any other interesting modules. Tel: Peterborough (0733) 424642 evenings.

SWAP OR P/EX Suzuki X7 250cc M/cycle 10 month m.o.t. tax, T/box rack, x-reg, g/cond, for D/drive, printer, monitor, suitable for Lynx or cash. Phone: Hugh 01-998 6065 eve.

SWAP YOUR BBC-B for my Suzuki X-7 250cc m/cycle 10 months m.o.t. tax, T/box, rack, x-reg, g/cond plus Lynx 96k plus software and books. Phone: Hugh 01-998 6065 eve.

SHARP STEREO music center for sale; SG-170EW, 72W, turntable, radio and cassette (with metal) plus speakers, sell £85, or swap for BBC printer or Grafpad. Tel: 08833 6687 (Surrey).

For Sale

MODEM FOR SINCLAIR SPECTRUM. Prism 500 + Brand new + instructions £50. Knutfield Ridge 2349.

BUSINESS S/W FOR SPECTRUM. Betadisk Professional, bought sales ledger, petty cash ledger, VAT calculator. £50. Tel: 01-504 9334 (evenings only).

AMSTRAD COMPUTER. Monochrome monitor, £70 of S/W, 1 Joystick. Swap for latest version of QL. Tel: 01-337 4595.

T1994A MINI MEM, PRK extended

Basic Pascal, plus other modules, joysticks. Today's price £400. Offers: 0339 21647 (Essex)

DUAL BEAM OSCILLOSCOPE. S.E. Labs SM 111: 15MHz bandwidth complete with two probe kits. Excellent working order. Wanted Dragon disk drives plus DOS or Delta drives plus DOS Tel: 07368 50478.

TEXAS T199/4A JOYSTICKS pair as new, unused £12. Spectrum programs: Ground Attack, Escape, Sound FX, Monster Mine, Autokopy, £2 each. Wanted: Phenax, Painter (A & F), Omnicalc II. Tel: Southampton (0703) 865086.

BROTHER EP22 printer-typewriter, RS232C interface 75/300 Baud. As new, boxed with paper and ribbons. Cost £170 sell for £100. Will send c.o.d. in UK. Phone Stevenage (0438) 723958.

T1994A + EXT Basic + Mini Mem + manuals + cassette lead + Invaders + prog. basic with TI + graphics and bar-chart tapes + one year TI mags. £145. Tel: (0685) 877909 after 6pm.

ZX SPECTRUM with free game £20 ono V.G.C. Contact: P. Gower, 4 Cilykard Crescent, Newport, Gwent.

QL PRINTER, Sekosha GP 250X, serial and parallel interface, 50cps dot matrix printer with graphics capability as new in box £175. Tel: 01-773 0495 evenings.

ZX interface 1 c/w RS232 printer lead. Virtually new. Cost £65, bargain £45 plus postage. Tel: (0373) 62051 evenings.

TEXAS TI-99 plus games worth £180 will sell for £75 ono. Make excellent Christmas present. Tel: Ramon or Steve on 061 205 5991 between nine to five weekdays.

DOWNSWAY programmable joystick for sale, with interface (Spectrum). £15.00. Phone 01-654 0053 evenings.

SHARP MZ700 with integral cassette plus two basics, 13 games, compiler and catalogues, etc. As new, boxed and guaranteed £185. Tel: Melksham 0225 704030.

DEUS EX MACHINA by Automata. Unwanted competition prize. Only £10. Worth £15. Phone Giles on (0625) 875475 after 6 p.m.

KAGA high res. green screen monitor, little used £85. W. H. Smith data recorder, new £28. Macclesfield 612502.

MUST SELL Sharp MZ700 with built-in printer plotter cassette plus Pascal E/Assembler 4 Basics and other software including games £190 worth £420. Tel: 0742 471160.

ZX MICRODRIVE, boxed, brand new, unused. Full guarantee £35. Tel: 0625 877 496.

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.....

ALPHA COM 32 printer, for Spectrum or ZX81. 6 months old. Very good condition £45. Tel: South Hokenden (0708) 857010.

TEXAS TI99/4A s/w Extended basic (new) £50. Various models from £5 to £14. Inc: Blasto, Car wars, Chess, Munchman, Pacsec. Tel: 01-992 4548.
BURROUGHS B80 mini-computer 2x8" drives, 2x2.3 megabyte drives 1 +30 2.3MB cartridges. Fully operational includes payroll, ledgers, account preparation, labelling, Cobol Compiler, Disk cleaner. Suit business or enthusiast £700 ono. Tel: Mark Rice (0804) 25045.

PLOTTER-PRINTER for TRS-80 and printer interface cable. Paper width 9", 75 characters across. £99 ono. Tel: Weybridge 57442.

BROTHER HR-15 professional electronic daisywheel typewriter & printer, centronics interface, comes complete with keyboard, 3 daisywheels, and error correction ribbons, worth £600. Accept only £300 ono. Tel: Andrew on 0625 614157.

SINCLAIR ZX microdrive and interface one, three cartridges and utility cassette. Complete with manual etc. Only £80. Tel: Norwich (0603) 400120 ask for Terry.

VIDEO GENIE EG3003 + books + 24 line programmable interface, 8255 based, suitable for control. Tel: 0535 44587 (Keighley).

ORIC 48K for sale, excellent condition. Over £100 worth of original s/w. Would make excellent Xmas present. Tel: 01-540 7860 for details.

16K COLOUR Genie with manual + tape recorder. £85 ono. Tel: Rhyll 0745 55423 after 6 p.m.

ORIC 1, Black & White TV cassette recorder. £45 of s/w. £55 of books. 10 editions of Oric owner mags. Open to offers. Tel: 01-699 5354.

NEC 8001 business computer 24K microsoft basic 32K RAM RGB hi-res monitor 80x25, 7 colour display. CP/M compatible w/printer cost £850. Bargain £300 or Dragon 64 + cash. Tel: 01-673 7877 evenings only.

PRINTER FOR SALE. Canonics 779, parallel interface, 3mm, cable. Offers. David — Hornchurch 42642.

ORIC MICRODRIVE B2A Printer. Dot Matrix 120 CPS. Block graphics. Pannelle + serial interface. Complete with leads £150. ono. Tel: 0789 68080.

EPSON TX80, 120 CPS, Dot matrix Printer + 3 new Ribbons. Simple, good quality printer, connects to most micros. £150. ono. Tel: Ashbourne 70645.

2 MICRODRIVES, ZX interface 1 complete compatible cassette. £200 of original s/w. Death Pack, Hobbit, Scorpio One, Kong £200. ono. Tel: 01-992 1362.

STAR GEMINI 10X printer for sale. Uses all Epson codes, friction + tractor + single sheet. PWO. £165 Tel: Leeds 786296.

OLIVETTI DISK DRIVE, suit BBC, Tandy, Video Genie etc. Good working order £75. ono. Tel: 08324 331.

DOT MATRIX printer Cosmos 80 two months old, as new. 80 CPS 80/142 columns £165 Telephone Hornchurch 55733 or work 01-594 3495 David Cole.

ATMOS 48K WITH software and books. Mint condition, still under guarantee. Great value at £85 ono. Tel: 0763-72928.

UNWANTED GIFT Telemod 2 modem compatible with BBC + C-64 no interface bought for £90 sell for £70 ono Tel: Gt Yarmouth (0493) 602977 Between 5pm and 8pm.

48K LYNX, in original condition, with leads, intro tape, manual and user mags. £85 ono Phone Hayes (Middx) 01-561 4653.

FOR SALE TR5-80 Model 1, 48K double density two disk drives printer + paper software manuals + leads £600 ono. Tel: (0905) 3583800 evenings Worcester.

"THE TIME MACHINE" by Channel Eight cost: £5.50. Tel: Byfleet 47415 4pm-9pm, or write to: 96 Woodlands Avenue, West Byfleet, Weybridge, Surrey KT14 6AP.

SHARP MZ 700 + TV monitor + data recorder + Space Invaders + Pac Man + Scramble and mailing list and more. Only 6 months old, sell for just £200. Tel: 061-486 9601.

CUMANA 100K Disc Drive for BBC, four months old, hardly used. With cables, utility disc and manual. Excellent condition only £80. Tel: Chertsey (09328) 62124.

SINCLAIR QL (lates version), with printer and monitor cables. £380. Tel: Aileen. Fareham 662533.

ORIC ATMOS 48K excellent condition + £70 worth s/w books, four Oric owner mags, two cassette leads, £150 ono. Write or call at 62 Almond Avenue, Kidlington, Oxford, OX5 1EW Phone (0867) 54654

PHILIPS G7000 Video game with seven games worth £2000. Will swap for Spectrum 48K games or Equipment of will sell for £60. Tel: 061-484 449.

S/W FOR 48K Lynk. Inc. level 9, Colossal Adventure, snowball, Golf, Muncher, Numerons, Willow Soft games Volume I. £25 the lot. All original. Tel: (0728) 747348.

TI994A vgc with cassette leads, joystick interface, books + tapes. £70 ono. Tel: 0590 78268

SHARP PC 145, manual, boxed, lyes, guaranteed. For a ZX81 or sell. Tel: 01-804 3229.

MUST SELL SHARP MZ700 computer with built-in 4-colour printer plotter and cassette plus Pascal M/code 4-basics zen ED/ASS and other software. Any offers considered. Tel: (0742) 471160 after 6.30pm.

MODEL RAILWAY layout N gauge 180ft track, 3 controllers, 6 locos, coaches, rolling stock, all unused value approx £370. Swap for computer or Commodore monitor. Phone (0395) 273143.

PHOTO-COPIER for sale, '3m Scotch Copier'. Perfect working order. Accept £35 or swap for ZX81 etc. (0224) 675717.

TELETEXT ADAPTOR for BBC. £160ono. Tel: 01-968 3092

INTELLIVISION TV game with voice cartridge + 2 games £50 Spectrum 48k with 8 tapes (games) £85. Atari VCS s/w + missile command etc. £75. Tel: 01-519 3874.

CURRAH MICRO SPEECH for ZX Spectrum. Excellent condition. Bargain at £18. Also "Sherlock" as new with manual for £7, and "Psytron" for £3. Tel: (0909) 477189 after 6 pm.

SANYO MBC 555 monochrome monitor. Only £900 inc. of vat + s/w eg: word star, data star, etc. Tel: Wigan (0942) 47423 before 5 pm, Gary or Dave.

AQUARIUS + date recorder £50. Tel: 061 308 4959.

14 MICRODRIVE Cartridges, £3.00 each. Tel: 01-458 6481 (eve.) Peter.

FULLER FPS Spectrum keyboard, £35.00 inc postage. Tel: Welwyn Gardens 24244.

NEW BRAIN MODEL A £90 ono, also Zenith mono monitor (cost £110) £90 ono, will sell separately or together £150. Tel: 01-858 1782 (London SE3).

MEMOTECH MTX512 64 rarely used, new last Christmas, £315, inc: 4 games, manual etc. Accept £175. Tel: Ruislip 77682.

SHARP MZ 80 A £175. Tel: Sheffield 872819.

ZX PRINTER C/W 4 rolls paper & p.s.u. still boxed. ZX81 Spectrum basic course book £4.00, ZX 81 NEC £2.00 Tel: 01-653 8102.

LYNX 48K for sale as new with manual, leads and some software £140. Tel: 01-699 9185 SE London.

APPLE II 54k Rampack 280 CP/M pack pal, encoder + disk drive £550. 56 Park House, Seven Sisters Road, London N4.

FOR SALE Fuller FDS keyboard for Spectrum £30, Currah micro speech £20. Phone: 959 3788 after 4 pm.

VIDEO GENIE EG3003 with built-in cassette, comes with manuals, books (incl. Capt. 80 Adventure), and programs. £90 + carr. Phone Phil, (0642) 818475 after 6 pm.

PERSONAL RECORDS module for TI99/41A computer. Tel: Downland 53157 (Croydon) eve.

CUMANA DISK DRIVE 40 track, half height, sell £110 ono or swap for Pioneer car radio/cassette player (auto reverse and digital tuning). Tel: 08833 6687 (Surrey).

RGB COLOUR 14" Microvitec monitor, Apple compatible, with case to match resolution 653(H) x585(V), excellent condition (still in original packaging) only £200 ono. Tel: (0203) 303784.

SHARP MZ 700 cassette printer plotter, pen sets, rolls paper, software, games, utilities, books £275 o.n.o. William Nagle, 19 Meikle Road, Glasgow G53 5JG. Tel: 041 883 0521.

AMSTRAD CPC 464 colour computer including educational and game software, only tow months old, items in original packing, only £187. Excellent condition. Phone Cy on 0279 28689 between 6-9 pm only.

SANYO DR101 cassette recorder, good working order, sale for £20 or swap for BBC software. Tel: 01-304 3659.

ADVENTURE HELPLINE

Nosferatu on Vic20. I have a decomposing corpse, an old witch, a man-eating shark and a dark tunnel — help!! Tom Liversage, 43 Gallus Square, Ferrier Estate, Kidbrooke, London SE3 9N2 (Tel 01-319 2190).

Twin Kingdom Valley on BBC. Can anyone help in the later stages of this adventure? Richard Ankers, 56 Ettington Close, Wellesbourne, Warwickshire CV35 9RJ.

The Hulk on Spectrum. How do I get the big gem? And how do I block the gas outlet? Stephen Fitzgerald, 10 Highfield Drive, Ickenham, Middx.

Mountains of Ket on Spectrum. How do I get past the skull and the dragon? I Musgrove, 53 Lower Village Road, Sunninghill, Ascot, Berks SL5 7AF.

Denis Through the Drinking Glass on Spectrum. How do you get out of Number 10? Stephen Barnett, 45 Linton Walk, Brookvale Village, Erdington, Birmingham B23 7YJ

Pub Quest on Commodore 64. I cannot cross the road that is in front of the pub? How do you open the cupboard in the toilet? David Bates, 7 Danelaw great Lumley, Chester-le-Street, Co Durham, DH3 4LU.

Voodoo Castle on Vic20. I cannot get through the crack in the wall. Conal Wright, 120 King George's Avenue, Leuscon, Suffolk, IP16 4JJ.

Snowball on Spectrum. I need help! John Rundle, 26 Western Road, Aldershot, Hants GU11 3PL.
Valhalla on Spectrum. I don't understand the third clue that helps you find Skornir. D Leech, 12 Hillcrest, Halton Brook, Runcorn, Cheshire.

The Count on Vic20. How do I get to the tomb and what use is the lens set in the oven. Michael Turpin, 115 Meadway, Hodderdon, Herts.

Hobbit on Spectrum. After collecting the ring, where should I go? How do you escape the goblin's dungeon? David McCall, 20 Manse Crescent, Stanley, Perth, Scotland
Calixto Island/Shinanigans on Dragon. How do I get to Calixto Island? Shenanigans — how do I get into the su-way? Paul Mitchell, 14 Honeybrook, Waltham Abbey, Essex EN9 3DD.

Velnor's Lair on Spectrum. Velnor always kills me with a bolt of lightning (I am a warrior). P Sellick, 1 Evenglade Park, Abingdon, Oxon OX14 3SZ.

Four Gates to Freedom on Vic20. What is the code to open the large metal door with the code-input panel? Raymond Kirk, Flat 1, 108 The High Street, Norton, Stockton-on-Tees, Cleveland.

Valhalla on Spectrum. All I can do is map adventure land. How do you start the quest? Penny Webber, 23 Osprey Park, Thornbury, Bristol, Avon.

Hobbit on Spectrum. How do you get out of the goblin's dungeon? How do you read the map? R Smith, 17 Kirton Close, Mansfield, Notts.

Hobbit on Spectrum. What do you do after opening the window to the goblin's dungeon? JA Saunders, 141 Lent Rise Road, Burnham, Bucks SL1 7BN

Valhalla on Spectrum. I can't find Drapnir. Who is my weak friend? K Norton, 8 Devonshire Close, Staveley, Chesterfield.

Ship of Doom on Spectrum. How do you get the key out from the glass cover? How do you get the body out of the ice block? Mr Hughes, 131 Holme Lacy Road, Putson, Hereford, HR2 6DG.

Snowball on BBC. I cannot find the combination to the door in the pink and green security alcove. Also, how do you use the screen? Mark Neale, West Kell House, Station Road, Patrington HU12 0NE

Dark Dungeons on Vic20. What does the magic scroll say when it is decoded? Anthony Coitman, 42 Carlton Avenue, Kenton, Middx.

Golden Baton on Spectrum. I can't get into the caves under the hut (I can't find a light). I have got the rag and matches. Stephen Manchester, 32 Watt Street, Southcoates Lane, Hull, N Humberide HU9 3BJ.

Knight's Quest on Spectrum. I cannot find the poppy to open the door. Craig Waddell, 14 Jarvie Place, Glenrothes, Fife, Scotland.

Dragon 32

- | | | |
|---------|--------------------------|-----------------|
| 1 (1) | Hunchback | Ocean |
| 2 (3) | Hungry Horace | Melbourne House |
| 3 (—) | Mystery of the Java Star | Shards |
| | | Software |
| 4 (2) | Chuckie Egg | A&F |
| 5 (5) | Cuthbert in Space | Microdeal |
| 6 (4) | Mr Dig | Microdeal |
| 7 (6) | Kriegspiel | Beyond |
| 8 (7) | Dragon Chess | Oasis Software |
| 9 (8) | The King | Microdeal |
| 10 (10) | Bug Driver | Mastertronic |

Atari

- | | | |
|---------|-----------------------------|-----------------|
| 1 (1) | Attack of the Mutant Camels | Llamosoft |
| 2 (3) | Computer War | Atari |
| 3 (4) | Zaxxon | Centresoft |
| 4 (4) | Sub Commander | Creative Sparks |
| 5 (9) | Tank Commander | Creative Sparks |
| 6 (5) | Carnival Massacre | Atari |
| 7 (2) | Leggit | Imagine |
| 8 (7) | Gridrunner | Llamosoft |
| 9 (—) | Encounter | Hi-tec |
| 10 (10) | Slinky | Centresoft |

Spectrum

- | | | |
|--------|---------------------------|-------------------|
| 1 (1) | Daly Thompson's Decathlon | (Ocean) |
| 2 (3) | Beachhead | (US Gold) |
| 3 (4) | Kokotoni Wilf | (Elite) |
| 4 (10) | Underworld | (Ultimate) |
| 5 (5) | Avalon | (Hewson) |
| 6 (2) | Danger Mouse in Trouble | (Creative Sparks) |
| 7 (—) | Pajamaram | (Microgen) |
| 8 (7) | Tornado Low Level | (Vortex) |
| 9 (6) | Deus Ex Machine | (Automata) |
| 10 (—) | Turmoil | (Bug Byte) |
- (Figures supplied by W H Smith)

Vic 20

- | | | |
|--------|-------------------------|-------------------|
| 1 (—) | Wizard and the Princess | Melbourne House |
| 2 (2) | Duck Shoot | Mastertronic |
| 3 (1) | Computer War | Creative Sparks |
| 4 (8) | Max | Anirog |
| 5 (—) | Sub Commander | Creative Sparks |
| 6 (—) | Tower of Evil | Creative Sparks |
| 7 (10) | Sub Hunt | Mastertronic |
| 8 (5) | Snooker | Visions |
| 9 (—) | Space Scramble | Mastertronic |
| 10 (—) | The Perils of Willy | Software Projects |

Commodore 64

- | | | |
|--------|----------------------|----------------------|
| 1 (—) | Fighter Pilot | Digital Intergration |
| 2 (—) | PC Fuzz | Anirog |
| 3 (—) | Hampster | Melbourne House |
| 4 (10) | Cludo | Leisure Genius |
| 5 (9) | Chiller | Mastertronic |
| 6 (—) | Beachhead | Centresoft |
| 7 (—) | Scrabble | Leisure Genius |
| 8 (1) | International Soccer | Commodore |
| 9 (—) | Bruce Lee | Centresoft |
| 10 (—) | River Raid | Activision |

Amstrad

- | | | |
|--------|---------------------|------------|
| 1 (2) | Harrier Attack | Durrell |
| 2 (4) | Code Name Matt | Micromega |
| 3 (7) | Chess | Amsoft |
| 4 (8) | Roland in the Cave | Amsoft |
| 5 (5) | Star Commando | Terminal |
| 6 (6) | Carnival Massacre | Atari |
| 7 (3) | Monster Chase | romick |
| 8 (9) | Admiral Graf Spey | Temptation |
| 9 (9) | Roland goes Digging | Amsoft |
| 10 (—) | Electro Freddy | Amsoft |

BBC

- | | | |
|--------|---------------------------|--------------------------|
| 1 (1) | Elite | (Acornsoft) |
| 2 (2) | Jet Pac | (Ultimate) |
| 3 (3) | Mr Ee | (Micropower) |
| 4 (4) | Frak | (Aardvark) |
| 5 (7) | Micro Olympics | (Database) |
| 6 (—) | 3D Grand Prix | (Software Invasion) |
| 7 (6) | Aviator | (Acornsoft) |
| 8 (—) | Eddie Kids Jump Challenge | (Software Communication) |
| 9 (10) | Erik the Viking | (Mosaic) |
| 10 (5) | Wallaby | (Superior) |
- (Figures supplied by W H Smith)

POPULAR
Computing
WEEKLY

NEW!

Readers' Chart

Vote each week
for your
favourite titles

Each week *Popular* will compile its own special software top ten chart — compiled by YOU

All you have to do to vote for your current three favourite software titles is to fill in the form below (or copy it out on to another sheet if you don't want to damage your magazine) and send it off to: Top 10, *Popular Computing Weekly*, 12-13 Little Newport Street, London.

To add a bit of spice we will be sending a £50 prize each week to the person who correctly selects that week's top three. If no-one gets it right the £50 will be added to the following week's chart and so on until someone gets it right! (If there is more than one winner that week's prize — whatever the 'pot' stands at — will be split equally between all the correct entries.)

Entries are now being accepted for Week 2. The chart fund stands at £50. Voting for Week 2 closes at 2pm on Wednesday November 28.

Name.....	My top 3: Voting Week 2
Address	1
.....	2
.....	3

Diary

Event	Dates	Venue	Admission	Organisers
Compec 84	Nov 13-15 10.00am-6.00pm Nov 16 10.00am-4.30pm	Olympia	£3.00	Reed Exhibitions 01-643 8040
6809 Colour Show for Dragon and Tandy Users	Nov 17-18 10.00am-6.00pm	Royal Horticultural Halls London SW1	£2.00 adults £1.00 children	Computer Marketplace 01-930 1612
Christmas ZX Microfair	Nov 17 10.00am-6.00pm Nov 18 10.00am-5.00pm	Alexandra Palace London N22	£1.50 adults £1.00 children	Mike Johnston 01-801 9172
Humberide Computer Fair	Nov 18 11.00am-5.30pm	Winter Gardens Cleethorpes	50p (accompanied children 25p)	Grimsby Computer Club 0473 694047
Computer Auction	Nov 28 6.00pm	Bonnington Hotel Southampton Row London WC2	Free	Crocker Computer Auctions 01-387 5838
Electron and BBC Micro User Show	Dec 6-9	New Horticultural Halls London SW1	£3.00 adults £2.00 children	Database Publications 061-456 6363

RUNE FOR MORE

Sometime last year, around a month or so before *Valhalla* was finally issued, Dorcas issued a program called *Oracles Cave* which featured an animated man who walked around, climbed ropes, fought baddies and hunted for treasures, in some ways the first animated graphics adventure.



Dorcas has now released a sequel to *Oracles Cave* entitled *The Runes of Zendos* which features the same general layout and a similar, although smaller, character.

The plot is complex and has been deliberately designed to function on different levels — on one it is a bash it out dungeons and dragons variant, on another it has a text adventure in which amongst other things you try to discover the meaning of various secret runes.

Here's the plot. The year has been trapped — the spirit of

each month is hidden in 12 Runic Hour Glasses which are scattered deep within a magical castle. You must find each glass and attempt to decipher the runes around it.

Top half on the screen shows the action — the little man who walks, runs, fights and climbs. The bottom is for you to input your sentence and for other information. There are a lot of options within the game including saving to microdrive. The 12 glasses form 12 connected, but separately playable, adventures, and you can switch to other adventures at any time during any game.

Graphically it's fair, but not to be compared with the likes of *Tir Na Nog*, nevertheless it's tremendously playable and should take ages to solve completely.

Program	<i>The Runes of Zendos</i>
Price	£7.95
Micro	Spectrum
Supplier	Dorcas 3 The Oasis Glenfield Leicester

NOT STUPID

Castle Blackstar is the latest release from CDS Micro Systems and is, unusually for the company, an adventure. Plotwise, what we have portrayed here is woman as powerful (and beautiful) force of good rather than woman as helpless (but beautiful) captive in the hands of evil.

Lady Artemis is a goodie;

CDS Micro Systems

CASTLE BLACKSTAR



she has hair like spun silver, is tall and willowy, and she has lost her power orb. Guess what you have to do.

First impressions of this adventure are good, it has a pleasing BBC like character set and has been very thoughtfully planned. The mark of a clever adventure is when it responds to incorrect inputs (ie, wrong guesses) intelligently. For example, when stuck in the woods I first tried jumping, to which it said 'after jumping up and down for a while you are forced, breathlessly, to stop', then I tried to climb a tree, basically I was told not to bother. Such things for addictiveness make; such a relief — it didn't say 'you jump'.

If you want a quality text adventure that won't irritate you with stupid responses, you'll enjoy this.

Program	<i>Castle Blackstar</i>
Price	£5.95
Micro	Spectrum
Supplier	CDS Micro Systems Silver House Silver Street Doncaster South Yorkshire

HACKABLE

Software Projects have, in *Lode Runner*, provided a game which is designed to be hackable. You are positively encouraged to redesign layouts, baddies and just about everything in *Lode Runner*. Without redesign what you get is a pretty unexciting version of *Apple Panic*; run along platforms, climb ladders, collect blobs.

However, it's easy to design your own screen layouts of platforms and ladders, placing baddies and goodies wherever you want. Thus rather like all those *Manic Miner* redesigners, you can make the thing as easy or difficult as you want.

Program	<i>Lode Runner</i>
Price	£9.95
Micro	Spectrum
Supplier	Software Projects Bear Brand Complex Allerton Road Woolton Liverpool



This Week

Maths Plus	Ed	Commodore 64	£6.95	Scisoft
Science	Ed	Commodore 64	£6.95	Scisoft
Time Trucker	Ed	Commodore 64	£7.95	ASK
World Geography	Ed	Commodore 64	£7.95	Superior Soft
Arcadia	Arc	Dragon 32	£5.50	Beau-Jolly
Number Painter	Ed	Electron	£8.95	ASK
Frogger	Arc	Jupiter Ace	£4.95	Mountsoft
Moneybags	Arc	Jupiter Ace	£4.95	Mountsoft

Number Painter	Ed	MSX	£8.95	ASK
QL Lisp	Ut	QL	£59.95	Metacomco
Knight Lore	Arc	Spectrum	£9.95	Ultimate
Battlecars	S	Spectrum	£7.95	Games Workshop
D Day	S	Spectrum	£7.95	Games Workshop
Run for Gold	S	Spectrum	£9.95	Hill McGibbon
Yacht Race	S	Spectrum	£9.95	Hill McGibbon
Backpackers Guide to the Universe	Arc	Spectrum	£7.50	Fantasy

PSI — LOW

It would be a shame if *Psi Warrior* — the new offering from Beyond — was completely overshadowed by the imminent release of *Doomdark's Revenge*, even though they are for different machines.

You are the very nicely animated Psi Warrior, gliding along the various colourful areas of the Home Silo, with a mission to do battle with and destroy The Source, who is seriously considering the reduction of the Human Race to mindless hulks. (Someone should have told him *Coronation Street* has done it already, twice a week for the last 20-odd years).

Descending though the Silo you must trap PSI and Id creatures before they get you, and increase your own mental powers at their expense. Then you can teleport, levitate, become invisible and remote-view your way to victory.

Looks like it could be worth a try ... plus there's the now obligatory competition.

Program *Psi Warrior*
Price £9.95 (cassette)
£11.95 (disc)
Micro CBM64
Supplier Beyond
Lector Court
153 Farringdon Road,
London EC1

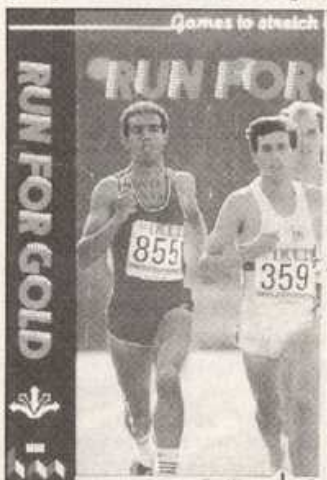
RUNNING IN

Run For Gold by Hill MacGibbon really is an excellent program, featuring some truly

excellent graphics. It's way beyond the usual left, right pummeling featured in *Hyper Olympics* and the rest. Here the real flavour of training and moving up through the ranks is apparent — running as tactics rather than keyboard bashing.

A large nicely animated sprite seen from behind is your runner; other runners are computer controlled. You need to control speed and movement, and left and right. All my early attempts resulted in me crashing across the tracks and smashing into another runner.

It isn't a matter of running as fast as possible all the time either, energy is finite and if you push too hard at the begin-



ning you'll have nothing left for the finish. And there are results boards, world record attempts, even occasional news flashes to spur you onto greater heights of competitive frenzy.

Program *Run for Gold*
Price £9.95
Micro Spectrum
Supplier Hill MacGibbon
92 Fleet Street
London EC4Y 1DH

Pick of the week

Knight Lore is quite simply the most technically awesome game Ultimate have ever released, graphically it makes everything else (except maybe *Tir Na Nog*) look neandathal.

What you get is a Zaxxon like, edge on view of the action, as a cartoonish Sabreman character moves around the rooms of a mysterious castle. Beyond this I can only speculate about the plot since Ultimate in its usual tradition gives nothing away on the box whatsoever. All I know is that your objective is to stop yourself from turning into a werewolf by finding a potion...

The graphics are masterpieces of design — Ultimate must be employing as many graphic designers as programmers these days. There are no colour resolution problems by the simple expediency (like *Tir Na Nog*) of making everything two-colour — I think it actually adds to the atmosphere.

Some rooms contain baddies of one sort or another to be avoided and most contain some sort of puzzle about how to get to the exit — a bit like *Manic Miner* in 3-D but with a greater freedom about how they are solved: eg, in one room it's a matter of getting some tables from a previous room and using them to jump high over an obstacle. In other rooms innocent-looking platforms dissolve to reveal traps beneath — elsewhere secret alcoves containing treasures

CARTOONESQUE



may be discovered.

Ultimate have termed this a 'do whatever you want with whatever you can find' option, filiation and it would seem to allow for much greater freedom of action, making the game that much more enjoyable.

I would stick my neck out and say that this must be one of the five best Spectrum games ever if it wasn't for the fact that some Ultimate games, whilst initially amazing have proved almost unplayable — *Lunar Jetman* being a case in point. I suspect that *Knight Lore* is going to prove very addictive indeed, though.

Program *Knight Lore*
Price £9.95
Micro Spectrum
Supplier Ashby Computers and Graphics
The Green
Ashby de la Zouch
Leicestershire LE65 5JU

This Week

Program	Type	Micro
Forest at World End	Ad	Amstrad
Er'Bert	Arc	Amstrad
Number Painter	Ed	Amsrad
Airlift	Arc	BBC
Jack and Beanstalk	Arc	BBC
Overdrive	Arc	BBC
Smash and Grab	Arc	BBC
Space Pilot	Arc	BBC

Price	Supplier
£6.00	Interceptor
£5.95	Microbyte
£8.95	ASK
£7.95	Superior Soft
£7.95	Superior Soft
£7.95	Superior Soft
£7.95	Superior Soft
£7.95	Superior Soft

Star Warp	Arc	BBC	£7.95	Superior Soft
Zany Kong Junior	Arc	BBC	£7.95	Superior Soft
Mr Wiz	Arc	Commodore 64	£7.95	Superior Soft
Raid over Moscow	Arc	Commodore 64	£9.95	US Gold
Smuggler	Arc	Commodore 64	£7.95	Superior Soft
U.K. Geography	Arc	Commodore 64	£7.95	Superior Soft
Astronomy	Ed	Commodore 64	£6.95	Scisoft
French	Ed	Commodore 64	£6.95	Scisoft
Geography	Ed	Commodore 64	£6.95	Scisoft

Price	Supplier
£7.95	Superior Soft
£7.95	Superior Soft
£7.95	Superior Soft
£9.95	US Gold
£7.95	Superior Soft
£7.95	Superior Soft
£6.95	Scisoft
£6.95	Scisoft
£6.95	Scisoft

HE SLIMED ME!

Who you gonna call? *Ghostbusters!* you may not have seen the film yet, perhaps you ignored the hit record but you shouldn't miss the program of the film of the record. *Ghostbusters* is not only a pretty good game, it has what must be the best music ever heard on a computer game. Using the Commodore Sid chip and a mere three channels, Activision have produced music that captures the record well enough to have the entire office and indeed all of Sunshine Towers bopping around the room.

Not only do you get music, but using some very nifty digital techniques you also get speech. As the music plays, press the spacebar and you get a very clear and slightly hysterical shout of *GHOSTBUSTERS!*

The game is more than an

arcade shoot-em-up, more like a strategy game mixed with a shoot-em-up. The idea is to make money by trapping ghosts making haunted houses suitable for ordinary American families. The first thing is to buy and equip your wagon — you need blasters and traps, and as you earn more money so you'll be able to buy bigger and better equipment.

Next stage is a map of the city which shows where ghosts are to be found. After driving along the road, you come to the house itself where the ghost must be trapped and blasted. The graphics are all consistently excellent and the game retains the interest — but the music!

Program *Ghostbusters*
Price £9.95
Micro *Commodore 64*
Supplier *Activision*
15 Harley House
Marylebone Road
Regent Park
London NW1 5HE

FAMILY FUN?

Now here's the simulation to end all simulations for paranoics everywhere. In *Nato Commander* you get to defend the free world from unprovoked Communist aggression. Experience tension on your East German borders! Fun for all the family!

Unlike many strategy games this one keeps the commands down to a minimum, mostly it's a matter of using cursors and a couple of keys to move units around, get status reports, etc. The large scale map of units includes relevant details such as terrain, rivers, etc; move-



ment works logically — ie, it takes longer over rocky hills than smooth flats.

If things go really badly you get to use nuclear weapons, though this costs you a penalty of one political point. That's all! The game is extremely sophisticated; factors like political opinion and morale are important considerations. There is also a choice of scenarios, one of which has Nato attacking first — surely we British would never do such a thing?

You may be one of those people who finds that the whole idea of European conflict is so frightening and disgusting it is not a proper subject for a computer game. If not, it is at least cleverly programmed.

Program *Nato Commander*
Price £9.95
Micro *Commodore 64*
Supplier *US Gold*
Unit 10
The Parkway
Industrial Centre
Heneage Street
Birmingham B7 4LY

ILLUMINATION

Games Workshop has released its first programs and, not surprisingly, all are loosely in the Strategy/Adventure mould rather than blam blams arcade response games. *Tower of Despair* is an epic adventure divided into two 48K Quilled adventures. Sometimes the Quill can be used lazily, but here thoughtful touches such as illuminated letters (illuminated as in monks rather than lights) and redesigned character sets ensure there is no sense of visual déjà vu.

Rather like the Salamander *Dan Diamond* series, the program comes with an illustrated booklet that also contains clues to the game as well as a couple of maps. The adventure itself looks pretty difficult.



Program *Tower of Despair*
Price £7.95
Micro *Spectrum*
Supplier *Games Workshop*
27/29 Sunbeam Road
London NW10 6JP



ASK, Applied Systems Knowledge, London House, 68 Upper Richmond Road, London SW15 2RP, 01 874 6046 **Beau-Jolly**, Beau-Jolly, 19A New Broadway, Ealing, London W5 5AW, 01 567 9710 **Fantasy**, Fantasy Software, 27A St. Georges Road, Cheltenham, Glos GL50 BDT, 0242 512231 **Games Workshop**, Games Workshop, 27/29 Sunbeam Road, London NW10 6JP, 01 965 3713 **Hill McGibbon**, Hill McGibbon, 92 Fleet Street, London EC4Y 1DH, 01 353 6482 **Interceptor**, Interceptor Micro's, London House, The Green, Tadley, Hampshire, 07356 71145 **Metacomco**, Metacomco, 26 Portland Square, Bristol, BS2 8RZ, 0272 428781 **Microbyte**, Microbyte Software, 18 Hilgrove Road, Newquay, Cornwall TR7 2QZ, 06373 6886 **Mountsoft**, Mountsoft Computing, 91 Killingworth Dr, High Barnes, Sunderland SR4 8QS, **Scisoft**, Scisoft, 5 Minister Gardens, Newthorpe

Eastwood, Nottingham NG16 2AT, 0773 764501 **Superior Soft**, Superior Software, Regent House, Skinner Lane, Leeds LS7 1AX, 0532 459453 **US Gold**, US Gold, Unit 10, The Parkway Ind Centre, Heneage Street, Birmingham B7 4LY, 021 359 3020 **Ultimate**, Ultimate Play the Game, Ashby de la Zouch, Leicester, LE6 5JV, 0530 411485.

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.



Inverted snobbery

Most speakers produce nongrammatical utterances (with varying frequency), but even so they are understood by other people. This is not so with computer languages, because if an utterance (say a line of program) is ungrammatical, the meaning of that line will not be understood by the computer. Another term for grammar, more commonly used with computer languages, is 'syntax'.

There is a crucial distinction between 'meaning' and 'grammar' in the case of computer languages, which is not as important for ordinary languages. For ordinary spoken languages, the difference between syntax and semantics can be the key element in much humour: A pun, play on words, or a 'knock, knock' joke depend upon the human ability to extract more than one meaning out of the same utterance.

The study of the meaning of a utterance in ordinary speech, or the meaning of a line of computer program, is termed 'semantics', and the study of any language is the study of both its syntax, and its semantics. Ordinary

spoken languages are often known as 'natural' languages, and with natural languages the rules are often not explicit, as they have to be with computer languages. Natural languages are not planned; they evolve.

I consider that one important reason why so many computer programs are badly written is that the programmer often uses the same approach to writing programs as he does in speaking his native language. Natural language is noted for its ability to fudge, and its lack of precision, which is acceptable in a spoken language, but is poor technique when programming a computer.

The incoherence of many programs, is related — so I believe — to a general malaise in education. The malaise is the fear of precision, the desire to take the easy route — the 'never mind the spelling, feel the emotion' syndrome. As the study of grammar becomes less and less important in teaching English today, tyro programmers are often unaware of the importance of syntax in their own spoken language, let alone in a programming language.

Anthony Burgess notes (in *Language made plain*) that it does not matter if 'gauge' is spelt 'guage', because we all know what is meant. But do we? Burgess' position presupposes an erudition on the part of the reader, which is not shared by the person who cannot spell. Sympathy for the illiterate is inverted snobbery from those who are not illiterate — and is unfair to those who are.

Computers, however, are not fooled. One underestimated benefit which comes from the use of computers is the realization that words are important, and that sometimes rules have a purpose.

Boris Allan

Electric shock

Puzzle No 134

David was looking decidedly pale and shaken in the office this morning.

"Just had the electric bill," he replied in answer to my questioning, "They reckon it comes to several thousand pounds!"

"There must be either a fault in the system or a mistake has been made somewhere," I tried to reassure him.

"It's odd," continued David, "but I took the reading immediately after the meter reader had left and yet their reading comes to 78,217 units more than mine."

He showed me the two readings and as I studied them some spark of understanding stirred. "Where is your meter?" I asked.

"Oh," he replied "under the stairs — right at the back of a load of old junk. In fact, the man from the electric company had to lie full length on an old table with his head dangling over the end, to read the wretched thing."

"Ah," I exclaimed, with a flourish worthy of Sherlock Holmes. "You see, what he did was to read the five-digits *upside down*. For example, 69801 would read as 10869."

Can you work out what the reading on the five-figure meter was?

Solution to Puzzle No 129

A = 66 B = 83

From the clues, we know that both A and B are in the range 32 to 99, as they have four-digit squares (Clues 1 down and 4 down). Also, B is the larger and exceeds A by at least 10 (Clue 5 down). By assigning values to A and B in the program, we can check if the relevant digits match in the grid.

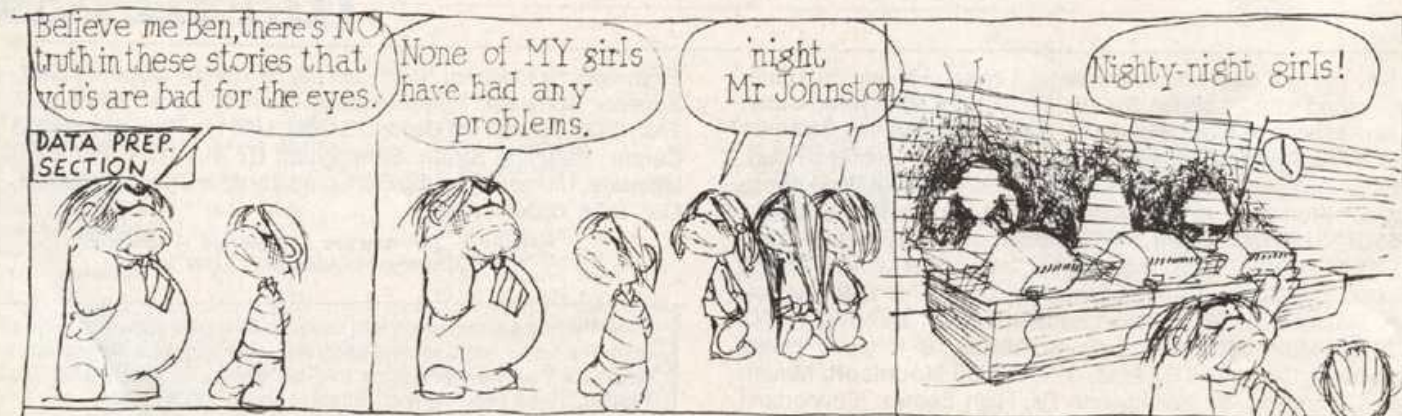
When comparing the position of digits within a string, the program assumes that the first character of the string is reserved for the positive/negative sign.

```
10 FOR A = 32 TO 82 20 FOR B = 49 TO 99 30 LET AS =
STR$(A) 40 LET BS = STR$(B) 50 IF MID$(AS,3,1)
<> MID$(BS,2,1) THEN GOTO 170 60 LET QS = STR$(A
+ B) 70 IF MID$(QS,4,1) <> MID$(BS,5,1) THEN GOTO
170 80 LET RS = STR$(A * B) 90 IF MID$(RS,5,1) <>
MID$(BS,4,1) THEN GOTO 170 100 LET SS = STR$(A *
A) 110 IF MID$(SS,4,1) <> MID$(RS,2,1) THEN GOTO
170 120 LET TS = STR$(A + B) * 9 130 IF MID$(TS,4,1)
<> MID$(RS,3,1) OR MID$(TS,5,1) <> MID$(QS,2,1)
THEN GOTO 170 140 LET US = STR$(B - A) 150 IF MID$(
US,3,1) <> MID$(RS,4,1) THEN GOTO 170 160 PRINT
"A="A "B="B 170 NEXT B 180 NEXT A
```

Winner of Puzzle No 129

The winner is S H Briers of Bingham Road, Sherwood, Nottingham, who receives £10.

The Hackers



Wally A Merry Christmas



Christmas Twin Pack with Christmas Card

Spectrum 48K Pyjamarama Automania £11.95

Commodore 64 Pyjamarama Automania £12.95

Amstrad CPC 464 Pyjamarama Master Chess £12.95

MIKRO-GEN

44 The Broadway, Bracknell, Berks. 0344 427317

