

40 Rock @

POPULAR Computing WEEKLY

6-12 December 1984

It's the best selling weekly

Vol 3 No 49

Atari 800XL price slashed



ATARI has further slashed the price of the Atari 800XL (see *Popular Computing Weekly*, November 22).

The retail price is now down to £129, a reduction of almost 25% from its previous price of £169.

The new price follows the announcement three weeks ago in the States that the 800XL would sell for just \$120 (about £100) over there.

The aggressive price cutting of the 800XL — Atari's only home computer in the Christmas market now that the 600XL model has been dropped — reflects Atari boss Jack Tramiel's policy of "marketing

for the masses".

"Manufacturing advances in high technology products mean that prices should be tumbling," commented Tramiel.

"Technology is what this decade is about. I've given this notion to my factories out in the Far East. They're going to produce it at the price the man next door can afford."

Atari factories worldwide are currently producing about ten million machines per year. A large proportion of these are targeted for the European market for 1985. Atari has recently appointed a European marketing manager, M. Rosi.

Further bargains for the Atari 800XL are available if you shop around. Laskey's, for instance, has an Atari Starter pack consisting of the computer, a joystick, data recorder, Introduction to Basic manual and one piece of software — which can be chosen from a selection — all for £170.

Prestel breached

PRESTEL, the British Telecom database, has suffered a second serious breach of its security.

On Sunday night a group of 'hackers' broke into Micronet only days after Prestel installed new security codes claimed to be unbreakable.

The 'hackers' took action after Prestel removed its second biggest information provider — Timeframe — from the system. Timeframe was asked by Prestel to withdraw a claim

continued on page 5

Minter lights up

JEFF MINTER, author of Llama-soft Commodore classics including *Sheep in Space* and *Attack of the Mutant Camels* is soon to release his first non-games title for the C64 — to be called *Psychedelia*.

The program is best described as a light synthesiser, where the user can create moving patterns of ever changing colour on screen (best done listening to a favourite LP) using a joystick.

The program operates much like a sound synthesiser — only with light — and it is



continued on page 5



Oric's new IQ164 computer — details inside.

INSIDE > MIDI KEYBOARD > ADVENTURE COMPETITION >

ISK SOFTWARE & THE COMMODORE 64:

Together We'll Make Your Heart Beat Faster

ROCKET BALL

In the year 2010 AD, World disputes are no longer settled on the Battlefield, but in the circular ROCKETBALL arena, victory going to the side scoring most goals.

No quarter is given, and no holds are barred — an epic struggle between the corporate forces.

This action packed Arcade style game includes all the features you would expect from an epic blockbuster.

- super smooth scrolling
- 100% Machine code
- Tremendous music
- shadow on ball
- 1 player versus computer or 2 player game
- Fast loader

"THIS WAS NEVER MEANT TO BE A GAME"

ROCKETBALL £7.95 inc.

T JOYSTICK ONLY



Drive your car through the four seasons race, bumping and barging your way to the front, and flying over rivers, oil patches and other obstacles. The more you bump, the more you score. Features superb graphics and sound — just like the arcade!

A fun packed machine code arcade style game designed for all the family — if you can get a turn!

"ARE YOU A 'KRAZY' DRIVER?"

KRAZY KARR £6.95 inc.

T JOYSTICK ONLY

In this futuristic scenario you, as Queens champion must meet the challenge of the evil knights, through the normal, survival and egg waves. Many hazards will attempt to prevent you from succeeding in your noble task, including Pterodactyls and Lava Trolls.

Written in machine code, this arcade style game includes all the features you would expect, to keep you and your Commodore locked in battle for hours!

"ARE YOU BRAVE ENOUGH TO MEET THE CHALLENGE?"

JOUSTE £6.95 inc.

T JOYSTICK ONLY



Our Software is available from leading chainstores, all good software retailers nationwide and in over 30 countries across the world. You can also order direct from us — all advertised software is in stock now and will be despatched within 48hrs of receipt of order.

ALL PRICES FULLY INCLUSIVE OF VAT and P&P — NO MORE TO PAY!

ISK SOFTWARE
ISK LIMITED

Unit 3c, Moorfields,
 Moor Park Avenue, Bisham,
 Blackpool, Lancs FY2 0JY
 Telephone (0253) 55282 Telex: 67232 IJKSOF G

24hr
 ANSAFONE



If I was thinking of buying a micro this Christmas I would be looking pretty closely at the Atari 800XL.

Atari last week slashed its price once again so that it now costs only £129 — the same price as the 48K Spectrum.

Yet the Atari has 64K Ram and offers a number of features found only on more expensive machines — it has a better keyboard than the Spectrum Plus which costs £179. It has four sound channels, one more than the Commodore 64 which costs £199. The Spectrum models have only a one-voice squeak. The 800XL has a cartridge port and twin joystick ports, unlike the Spectrum models. It even has a monitor socket, sprite graphics and a display with up to 256 colours on screen at any one time.

In the words of Atari's latest ad the 800XL has now well and truly "socked the competition".

It's a big gamble. Before Jack Tramiel — Commodore's founder — split away and bought Atari in June the company had been losing \$800m a year.

He has worked quickly. We now have a considerably slimmed down Atari that is proving to be very aggressive in the market. He has just borrowed a further \$150m from his US investors push Atari back into the limelight. "Too many people have got too fat out of this business", he says.

The only problem with the Atari 800XL is software. The best programs are still unquestionably to be found on the Spectrum and Commodore 64 machines. Still, that should come if Tramiel's plan works.

The Atari 800X is now a very attractive purchase at £129. It makes Sinclair's Spectrum Plus — without either ZX Interface 1 or 2 built-in — look a bit mean, and the Commodore 64 look very overpriced.

It makes the £275-plus MSX micros look like no-hopers.

POPULAR Computing WEEKLY

Vol 3 No 49

>Presents...

News Oric's new IQ164 > Spectrum + problems

Competition > Adventure competition to win *The Sandman Cometh*

Star Game > Ashley Watson challenges your piloting skills with Lunar Module on the Dragon 32

Software Review > McGraw Hill's QL Assembler reviewed by Andy Pennell > Psion's Matchpoint on the C64

Streetlife > Christina Erskine views robots in action at Ford Motors on the Sierra line

Hardware Reviews > Disc interface for Spectrum > Siel MK900 music keyboard

Spectrum > Reverse your Polish on any Spectrum thanks to Richard Armstrong

Commodore 64 > A parallel printing routine from Adrian Warman

BBC & Electron > How to print out user defined graphics on your Epson

Amstrad > The depths (and heights) of the Amstrad CPC 464 revealed by Colin Harris of Nemesis Software

Best of the Rest > Letters 9 > Dragon 45 > Flight Simulator Result 51 > QL Page 60 > Elite Competition 64 > Open Forum 72 > Arcade Avenue 72 > Microradio 75 > Baud Walk 76 > Music Box 78 > Book Ends 80 > Peek & Poke 84 > Adventure Corner 88 > Readers Chart 98 > Top Ten, Diary 98 > New Releases, This Week 99 > Ziggurat, Puzzle, Hackers 102

>Futures...

Which MSX? We spot the differences... And a machine-code taster of Jeff Minter's new *Psychedelia* to type in



5
12

16

22

34

36

42

49

54

66

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 6611, telex 261643. © Sunshine Publications Ltd 1984.

ABC

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

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

Computer Trade Association Magazine of the Year



Selected
Stores

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

CBM 64
Also on Electron and
BBC - Domes and
Land Colour

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

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

EMPIRE

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

Played on 7 full Graphic
World Maps



SHARDS
Software

WORLDS APART

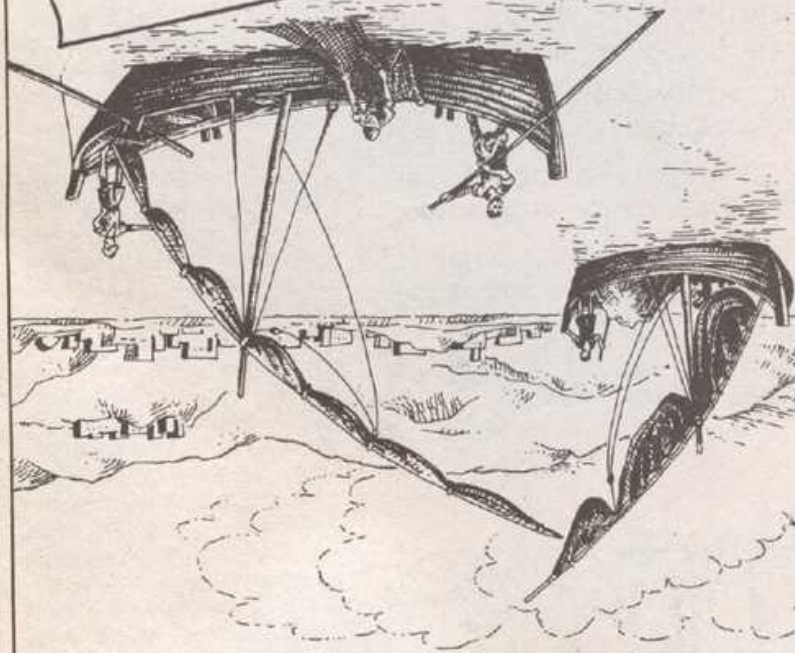
Written by Peter Goodlad - Author
of JERICHO ROAD.

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

The long awaited sequel to
JERICHO ROAD

GALILEE



for SPECTRUM 48k

SHARDS SOFTWARE PRESENTS ...

Psychedelia

continued from page one

possible to produce pre-programmed sequencing, and pre-set shapes. You can define the starting shape from which the program constructs its patterns and you can control the colour rotation sequence.

A number of built-in 'planes of symmetry' can be switched in or out to produce multiple images on-screen.

Further variation can be achieved by altering the bandwidth and the pulse length of the shape 'trail' which changes how the joystick effects the patterns. Finally, it is possible to record pattern sequences and then play them back.

"I enjoy writing games but I wanted to write something totally non-competitive but at the same time great fun to play and experiment with," explained Jeff Minter.

Psychedelia is being released in mid-December for the Commodore 64, C16 (which has a 128-colour display) and Vic20, priced at £7.95.

QL releases

IN THE same week as Psion's QL chess program is to be released Sinclair has announced a number of other new QL titles, which will become available before January.

An assembler package has been produced by GST which will be priced at £39.95.

QL Toolkit written by Tony Tebby and Sinclair adds 60 new commands to SuperBasic including full multi-tasking. QL Toolkit will sell for £24.95.

QL Cash Trader written by Accounting Software giving a dynamic profit/loss accounting system will sell for £39.95.

Finally, QL Linker from GST is a relocating linker for programs written in compiled languages of M68000 assembler.

CPC464 Forth

NEW hardware and software products have been announced for the Amstrad CPC464 by Skywave.

The company has produced an RS232 communications interface priced at £71.30, and also a Forth (Forth standard) language package on cassette, priced at £20.70, for the machine.

Details from Skywave, 73 Curzon Road, Boscombe, Bournemouth.

New IQ164 details

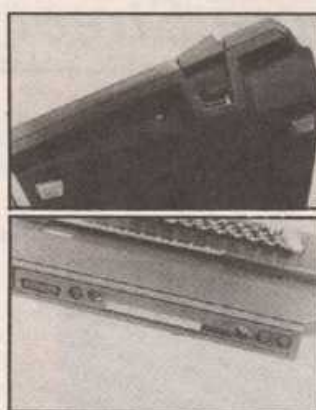
THE new IQ164 Oric machine, due for launch in January on the continent (as the Stratos) and in the UK shortly afterward, will be priced around £250.

The machine looks remarkably similar to the Atmos, using the same keyboard and black and red colouring on the casing.

The two cartridge slots on the upper left-hand side will offer a total of 112K Rom space for languages and applications programs. The machine contains no internal Rom — Basic is provided on a plug-in cartridge.

When Basic is used the function key can be used simultaneously with the other keys to give a single Basic keyword entry.

The machine also offers a Centronics printer interface,



two modem ports — one RS232, one V23, two Atari-style joystick ports, a cassette socket and both UHF and RGB/Peritel TV connections. It has a built-in disc controller and a Shugart 34-pin interface — giving the option to use 5inch discs as well as Oric's 3inch Hitachi-based discs.

Spectrum+ hits snag

SINCLAIR's Spectrum+ computer has run into reliability problems and the number of faulty machines has resulted in a severe shortage of the micro in the shops.

"The shortage of Spectrum+ machines is having a devastating effect on the Christmas market," said John Flatman, of Boots' computer buying department. "People are waiting until the machine finally arrives rather than buying an ordinary Spectrum, and it seems there are severe quality problems with the machine."

At W H Smith, a spokeswoman confirmed that the shops were not getting as many machines as they needed.

"We have been having problems with the keyboard in that many of the keys seem to be loose. Consequently, we have been looking at them and tes-

The Net spreads

MICRONET 800 is expanding abroad. A franchise to run Micronet has been given to the Hong Kong telephone company and Swedish PTT.

The Swedish franchise will make Micronet available to users in Sweden, Norway and Denmark.

Micronet's managing director, Tim Schoonmaker, says this is just the beginning. "Our next target is to take Micronet 800 to micro users in Australia and the United States."

ting them as they come out of the boxes.

"Recently the problems haven't been quite so bad as they were to begin with, and we are beginning to get replacements, though not enough."

"I am not aware that the situation is at all difficult at the moment," said Sinclair spokesman. "My impression is that things are a lot more positive this year than they were twelve months ago."



Prestel

continued from page one

that Prestel's security had been broken and when they failed to comply Prestel removed them from the system.

Angry hackers then succeeded in breaking into Micromouse on Micronet leaving the message "Bring back Timeframe — hack of the century".

The same group is also apparently attempting to break into BT's prestige information service BT Gold.

Elite bugged

THE Electron version of *Elite*, Acornsoft's top selling game has run into problems.

A bug has been found that means Hyperdrive between galaxies is impossible in the cut-down Electron version, making the playing area an eighth the size of its BBC counterpart.

An Acornsoft spokesperson commented "the single galaxy restriction does not affect the actual playing of the game. It is still possible to achieve Elite status."

Acornsoft Managing Director, David Johnson-Davies explained further:

"There is a bug in the program that means the game is played in one galaxy, but this does not affect the playing of the game — Elite status can still be attained."

"We regret the bug is present but, given the complexity of the game, it is difficult to guarantee the lack of bugs."

"However, if customers feel strongly about the matter, we will refund their money."

Acornsoft says that it is currently working to cure the problem and is looking at the possibility — if an eight-galaxy version can be produced — of replacing one-galaxy copies already sold with the corrected version.

Until it is known whether or not the problem can be solved, Acornsoft have no plans to alter the documentation supplied with the game, despite the fact that it clearly states that Hyperdrive is possible.

Micronet

Following last week's News Desk item headed *QL network by Prism*, we would like to make clear that Prism no longer has any connection with Micronet which is run jointly by EMAP and British Telecom.

COMPUTERS

of Wigmores Street

104 Wigmores Street, London W1H 9DR

SPECTACULAR SOFTWARE SALE

ALL NEW RELEASES £1.00 OFF

Ghostbusters £9.99
Knight Lore £8.95
Skoodaze £4.95
Cyclone £5.95
Bruce Lee £8.95
Staff of Kamatta £8.95
Skyranger £4.95
Lode runner £6.96
Jet Boat £6.95
Pitfall II £6.99

Any new releases not listed here phone for availability
Many other titles half price including All Memotech, Electron & Amstrad
i.e. Deathchase, Blagger, Jet Power Jack (all Half price)



Hardware Bargains

Spectrum 48K including £56.00 of free software
Spectrum + including free software
Commodore Plus 4 including business software on rom
Commodore 64 + C2N dataset + joystick
Sanyo MPC 100 64K MSC Machine
Memotech MTX 512 64K memory, sound, colour
BBC 'B' + Recorder + £50.00 free software
Sanyo MBC 555 + Wordstar, Datastar, Mailmerge
Sinclair QL Sinclairs powerful new 128k computer
Tatung Einstein including One 3 inch double sided drive
Pison Organiser
Admate (Shinwa) DP80 High quality and versatile dot matrix
Brother HR1 superb Daisywheel printer
Commodore MPS801 compatible with all the Commodore
micros
£128.95
£179.95
£229.00
£249.95
£297.00
£297.00
£250.00
£398.00
£1100.00
£397.00
£497.00
£399.95

PRINTERS

PERIPHERALS
Technology research double density disk interface for the ZX Spectrum
including Cumana 100k disk drive
Rotronics Wadriver
Euro-electronics ZX1 print III printer I/F
Ram Turbo joystick interface
Alphacon 32 Thermal printer for ZX Spectrum
RGB interface for the ZX Spectrum
BBC DISK DRIVES
Single 100K disk drive with formatter/manual/cable
£119.95
Single 400K disk drive 40/80 track with formatter/manual/cable
£169.95
BBC ROMS
Wordwise—Simple to use professional word processor
View—Highly professional wordprocessor by Acornsoft
Viewsheet—A Spreadsheet to accompany Acornsoft's VIEW
£59.80
£46.00
Also TERM, COMMUNICATOR, GRAPHICS, CARETAKER, PRINTMASTER ROMS
MONITORS
Microvitec 1451 DQ3 medium res. for Sinclair QL.
£275.00
Microvitec 1431 MS4 standard res. for BBC
£229.00
Microvitec 1446/LI high res for IBM and Compatibles
£258.00
Prism QL standard res. for Sinclair QL
£199.00
Kaga Green screen High resolution
£125.00
We also can make cables to suit your own needs



Up to £1000
Instant Credit



Sanyo MBC 1150 dual drive + Software RRP £1695.00
Sanyo MBC 550X dual 160k drives + Software RRP £1149.00
ALL PRICES INCLUDE VAT.
£1035.00

DEMO MODELS

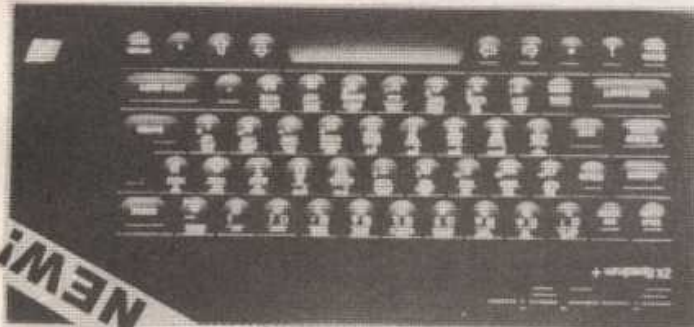
1 only of each

Microvitec 1451 DQ3 medium res. for Sinclair QL.
£275.00
Microvitec 1431 MS4 standard res. for BBC
£229.00
Microvitec 1446/LI high res for IBM and Compatibles
£258.00
Prism QL standard res. for Sinclair QL
£199.00
Kaga Green screen High resolution
£125.00

Wordwise—Simple to use professional word processor
View—Highly professional wordprocessor by Acornsoft
Viewsheet—A Spreadsheet to accompany Acornsoft's VIEW
£59.80
£46.00
Also TERM, COMMUNICATOR, GRAPHICS, CARETAKER, PRINTMASTER ROMS

MONITORS
Microvitec 1451 DQ3 medium res. for Sinclair QL.
£275.00
Microvitec 1431 MS4 standard res. for BBC
£229.00
Microvitec 1446/LI high res for IBM and Compatibles
£258.00
Prism QL standard res. for Sinclair QL
£199.00
Kaga Green screen High resolution
£125.00

PERIPHERALS
Technology research double density disk interface for the ZX Spectrum
including Cumana 100k disk drive
Rotronics Wadriver
Euro-electronics ZX1 print III printer I/F
Ram Turbo joystick interface
Alphacon 32 Thermal printer for ZX Spectrum
RGB interface for the ZX Spectrum
BBC DISK DRIVES
Single 100K disk drive with formatter/manual/cable
£119.95
Single 400K disk drive 40/80 track with formatter/manual/cable
£169.95



AIRWOLF is the latest game from Elite Systems based on the ITV series of the same name.

The player must guide his helicopter through 12 playing

screens to rescue, one by one, six kidnapped scientists.

The program will be available this month for the Spectrum priced at £6.95, and the Commodore 64 at £7.95.

● Following the Elite launch, advertisements for a forthcoming Ocean game, also entitled *Airwolf* have been withdrawn.



Sir Clive goes on show

A WAXWORK model of Sir Clive Sinclair will be on show in Madame Tussauds from next April.

Work on 'Sir Clive' himself has now been completed, but he will not be put on display until a model of Selina Scott is finished, as the two will appear in a tableau together.

"Sir Clive will be shown holding one of the Sinclair pocket TVs," explained a spokeswoman for Madame Tussauds. "Selina Scott will be looking over his shoulder, looking at the TV screen, on which there will be a picture of herself."

Free bundles

TOSHIBA is currently offering three software packs bundled free with its new Toshiba HX-10 MSX computer.

The three packs are CDS Micro Systems *French is Fun*, Ocean's *Hunchback* and *Manic Miner* from Bug Byte.

"These three were chosen largely because we wanted chart-topping products, such as *Manic Miner*," said a Toshiba spokesman. "But we are keen to emphasise that MSX does not just mean games machines, so *French is Fun* was added to the list."

Learn to read ...

SINCLAIR has released a further 13 educational titles for the Spectrum and Spectrum+.

Two — *Estimator Racer* and *Number Painter* — are ASK titles produced in association with Psion and priced at £4.95.

The remaining 11 at £7.95 are Sinclair Macmillan programs. Four of these are science simulations written by Five Ways and five are additions to the Learn to Read series from Fisher Marriot.

Tickets still to be claimed

A NUMBER of winning raffle tickets from the 14th ZX Micro-fair held on November 17 to 18 are still unclaimed.

The prize winning ticket numbers are as follows:

Green — 570, 582, 559, 834, 768, 879, 474, 993, 615, 871, 949, 625, 472, 309, 736, 697, 496, 684, 454, 817, 347, 303, 862, 900, 564, 478, 382, 271, 557, 275, 295, 420, 632, 347, 679, 711, 520, 349, 303.
Red — 770, 396, 568, 454, 645, 812, 515, 458, 960, 628, 752, 763, 402, 461, 475, 413, 436, 503, 493, 473, 372, 389, 413, 606, 411, 824, 506, 436, 611.
White — 230,344, 201, 140, 503, 664, 498, 393, 689, 339, 502, 650, 120, 693, 474, 284, 89, 110, 148, 422, 200, 264, 148, 64, 187, 422.

Blue — 34, 111, 73.

The raffle, in aid of Capital Radio's 'Help a London Child' raised over £700 for London children in need.

The first prize was won by Mr M Slatford of S Croydon, Surrey.

If your ticket number appears above write to: ZX Raffle, 71 Park Lane, Tottenham, London N17 0HG, enclosing the ticket and a label with your name and address.

FOOTBALL MANAGER

Designed by Kevin Toms

for the Commodore 64

Some outstanding features of the game

- Matches in 3D graphics • Transfer market
- Promotion and relegation • F.A. Cup matches
- Injury problems • Full league tables • Four Divisions
- Pick your own team for each match • As many seasons as you like
- Managerial rating • 7 skill levels • Save game facility
- Financial manipulations • 64 teams and customising feature
- You can even be sacked!

Prices: BBC Model B £7.95
Commodore 64 £7.95
Spectrum 48K £6.95
ZX81 16K £5.95

(N.B. 3D GRAPHICS ARE NOT INCLUDED IN THE ZX81 VERSION)
Overseas orders add £1.50

Strategy Game of the Year, 1983
(Nominated)

Golden Joystick Awards

addictive

Available from computer software stockists nationwide, including



and

John Marzies

Addictive Games

7A RICHMOND HILL, BOURNEMOUTH BH2 6HE

To order by mail (p&p free) send cheques or postal order to:



QLUB fights back

In answer to the several points raised in R. Haigh's letter in the November 15 issue, Sinclair Research should like to point out that:

1) The second *QLUB News* was distributed on November 12 and our records confirm that R Haigh was part of that mailing.

2) The new-version Psion update will be offered free of charge to QLUB members as part of their membership entitlement. We may subsequently offer these up-dated versions to non-QLUB members but there would be a charge.

3) While R Haigh may feel that he does not need Psion software assistance, experience to date suggests that a large number of QLUB members do very much value this service — so far some 8,000 enquiries have been handled.

QLUB Editor
Sinclair Research
Cambridge

Ultimate news 1

I am writing this letter to put Mr N Brailsford who asked about Ultimate games on the 64, out of his misery. Ultimate have already produced a version of *Jet Pac* on disc — although I must admit that my *Jet Pac* is a pirate copy of a pre-release version.

PS Ultimate have released a game called *The Staff of Karnath* for the 64.

PS Sorry about the pirate version, Ultimate!

D Page
2 Park Approach
Welling
Kent

Ultimate news 2

I wish to stake my claim to be the first person to complete Ultimate's new Megagame/Movie/Classic program *Knight Lore*. After two weeks of solid playing I stirred in the last charm and was cured. This historic event (!) took place on Friday the 23rd of November at 6.19pm for those who wish to challenge my

claim. I won't say exactly what happens as it will spoil the aim of the game for other people. Seeing as the cassette inlay is so vague, as are reviews, here are a few playing tips:

- 1) You need two of each of the seven charms.
- 2) You must drop them in the cauldron in the correct order.
- 3) This is indicated by the cauldron steam.
- 4) You can't have three or more objects in a room.
- 5) You can drop and pick up, objects simultaneously.
- 6) Keep track of what you have collected.
- 7) Make a map!

Andrew Wappat
15 Darngate
Longthorpe
Peterborough

Misleading review

Your *Book Ends* review of Adrian Dickens' *The QL Advanced User Guide* (*Popular Computing Weekly*, November 15) is extremely misleading in its references to the 'Sinclair QDOS manual'.

This manual was in fact a preliminary draft of the QDOS documentation — a working piece of documentation which has never been published in any official form. It has been supplied by Sinclair Research Limited *only* to software houses who have applied for it.

Anyone subsequently seeking permission to quote from the manual has been warned of possible errors, and permit-



"What do you suppose Jack Tramiel's trying to do?"

ted to proceed only and entirely at their own risk, on condition that Sinclair's copyright in the material is acknowledged.

Sinclair expects to publish shortly its own comprehensive official Software Developers Guide.

Software Department
Sinclair Research
Cambridge

Imagine a micro

Even in the advanced digital microcomputer world we still have an electro-mechanical problem — the mass storage devices called disc drives.

A low-priced home micro costs around £150 — the disc drive which goes with it still costs up to £230. For the non-professional user a disk drive therefore seems rather expensive for what it does — storing and retrieving data — in comparison with the multitude of basic functions of the micro-keyboard, video-control, music, programming.

To be complete a drive has also secondary functions: the organisation of the data (*Copy, Delete, Merge, Directory*). It is these functions which make the drive so expensive.

Supposing it was possible to execute these secondary functions inside the computer without intervention of the mass storage device after the data is loaded.

I imagine a micro with 512K Ram and a fast tape or streamer as a mass storage device. Loading and saving memory would only be possible in sequential blocks of a fixed length: say, 192K Ram. This would make the tape operation very simple — a computer controlled start at the beginning and a stop at the end of the block. Without making the streamer too expensive it still must be possible to *Load* or *Save* a block in less than 15 second. Organising the data before saving would also be very easy, it would only be a matter of changing the data locations in the memory. Random accessing would no longer be a time consuming operation. With 512K Ram as memory it would be possible to

have two of the memory blocks present in the computer for merging and copying files. Moreover the DOS could be replaced by a simple, short menu-driven program.

It must be possible to build and sell a micro like this with a built-in fast tape unit for less than the cost of a micro plus disc drive — £400.

Cormon Eddy
Hof Van Tichelen 26
B2020 Antwerp
Belgium

Is the QL the kind of machine you had in mind?

Dragon still fiery

I was very disappointed to read in last week's *Popular Computer Weekly* that you were surprised at the large turn-out at the 6809 show.

The Dragon is alive, well and kicking like mad with a lot of support from a lot of not so small companies — not to mention a lot of owners who obviously don't think the Dragons are dead.

So many reviewers in the computer press obviously never switched on their review samples of the Dragon. If the number of non-existent Rom-bugs they all found is anything to go by it amazes me that it sold at all.

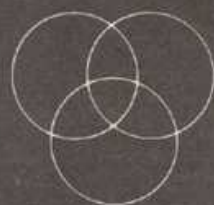
The Dragon is without a doubt far superior to the BBC, Spectrum and QL (I nearly forgot the Spectrum Plus with its drop-off keys which allow one to completely redesign the keyboard layout) etc, which is all most magazines (including yourselves) seem to class as computers.

If only the reviewers had bothered to admit that all they did was read the manual and base their review on that we might still have Dragon Data. If I appear to be upset it is because I am very disappointed to see the computer press are still kicking the Dragon when it is (a little) down.

Long live the Dragon.

J E Slad
3 Bridges Close
St Nicholas-at-Wade
near Birchington
Kent

LOGIC 3



**HOW TO SAVE
£££'s
ON THE COST OF
SOFTWARE
AND HARDWARE
ADD-ONS...**

Simply cut out the coupon below
and post to:

**BUMPER
20 PAGE ISSUE
CHRISTMAS COMPETITION!**



Simply cut out the coupon below and post to:

LOGIC 3

Spectrum Club

BRITAIN'S No.1 SOFTWARE CLUB

WINTER ISSUE 1984/85

MICRODRIVE

INSIDE

★ EDUCATION
A selection of the most educational programs

WIN A MICRODRIVE

Christmas Competition
1st prize: ZX Microdrive & ZX
Interface 1 (worth over £70)
2nd prize: Currah μ Speech
Synthesizer (worth £29.90)
... up prizes of free
... each wor

10 runner up prizes of free games software (each worth £10)

To Celebrate the Christmas season Logic 3 are running a grand Christmas Competition with a ZX Microdrive and Currah µSpeech Synthesizer as first and second prizes.

The ZX Microdrive, complete with Interface 1, is undoubtedly the ultimate Spectrum add-on allowing programs and data to be quickly saved and recalled. The Currrh µSpeech is both powerful, featuring an infinite vocabulary, and easy to use.

To enter the competition carefully read the reviews in this catalogue then answer the questions in the Quiz 3. All entries received before 31st January will be eligible for the competition. Prizes will be awarded to the first 12 correct answers.

Here's your chance to win these desirable Spectrum add-ons, but don't leave it too late, make sure your entry reaches Logic 3 before the closing date!



CLUB SUCCESS

CLUB SUCCESS The Logic 3 Spectrum Club was launched in July, 1984 and has been an outstanding success. Already more than half-way to its first year, the club has kept Logic 3's staff working seven days a week.

The Logic 3 Spectrum has been an outstanding success. A target of 10,000 members in twelve months has been achieved. Logic 3's staff working week just to keep up with demand. Tony Toller, Logic 3's managing director and coordinator of the Club, explains its success as follows: "With other clubs once a person has joined there is no more reason for the club to try to support its members who each month have to purchase a certain number of products from a short list. Our Club is different. Members have no obligation to purchase any products from the club so to choose only the best quality products at the best possible price. It is a lot of pride."

3. Spectrum Club has something for
 you. Excellent savings on all the
 educational software.

The Logic 3 Spectrum Club has something for everyone: regular reviews, excellent savings on all the latest top quality games and educational software, and discounts on hardware.

MEMBERS INTRODUCTORY OFFER
 Within 60 days and benefit from
 purchase our "Software

NEW MEMBERS INTRODUCTORY OFFER
Spectrum Club within 60 days and benefit from
a huge discount. **PER YEAR**

NEW MEMBERS INTRODUCTORY
Join Logic 3 Spectrum Club within 60 days and benefit from
new members introductory offer to purchase our "Software
Specials" at a huge discount.
SPR IS ONLY £3.00 PER YEAR
(£250 per month)

MEMBERSHIP IS ONLY £3.00 PER YEAR
(Equivalent to only 25p per month)

MEMBERSHIP IS ONLY £3.00
(Equivalent to only 25p per month)

TO JOIN FILL IN YOUR NAME AND ADDRESS ON THE ORDER FORM (OR ON A SEPARATE SHEET OF PAPER) AND SEND WITH YOUR £3.00 TO THE ADDRESS BELOW.

MEMBERSHIP DEPT.
THE LOGIC 3 SPECTRUM CLUB
ATTENTION HOUSE

MEMBERSHIP DEPT.
THE LOGIC 3 SPECTRUM CLUB
MOUNTBATTEN HOUSE
VICTORIA STREET
WINDSOR, BERKS

INSIDE

★ **EDUCATION**

EDUCATION
A selection of the most effective educational programs available.
Designed for children from the age of 4 to 16.

★ GAMES

GAMES
The best games for the Spectrum selected by our own review panel and rated according to: graphics, sound, colour, originality and interest.

★ **PROGRAMMING**
Learn BASIC* tutor how to

PROGRAMMING
The 'Learn BASIC' tutorials really show you how to write structured programs in easy to understand stages.

★ UTILITIES

UTILITIES

Design your own games.

★ **HARDWARE**
Some good deals
and peripherals.

HARDWARE
Some good deals in hardware
and peripherals.

**LOGIC 3's
SOFTWARE
PANEL**

PANEL
Neil Atkinson, pupil of Sir William Borlase School, spends his weekends in a shop selling home computer software, intends to be a journalist.

Andrew Goltz, director of Logic 3, spent 6 years with Commodore's UK and International Division, instigated Commodore's 'Approved Product' scheme for third party software.

Bliss Healey, graduate of London School of Economics, has translated business software into French, currently working on the design of graphics for educational software.

Tony Toller, director of Logic 3, former journalist, specialist in business applications on Micros and co-ordinator of Logic 3's software club.



Yes, please rush me a copy of your Software Club catalogue

I have a ☐ ZX Spectrum ☐ Commodore 64
(tick box)

Name

Address.....

**FREEPOST
(MEMBERSHIP DEPT.)
LOGIC 3
MOUNTBATTEN HOUSE
VICTORIA STREET
WINDSOR
BERKS.**

Competition

Perchance to dream

This week we offer you the chance to enter an intriguing adventure puzzle based on the new epic adventure, *The Sandman Corneth by Star Dreams*

The Prize

The Sandman Corneth is an adventure through the dark side of the mind, where logic is twisted and opposites meet. The objects of material reality are seen in strange new guises, the substance of the

mental world holds sway.

To solve *The Sandman Corneth* you will need to learn the significance of dreams from Freud, symbols of reason from the world's greatest philosophers and jokes from the backs of matchboxes. *The Sandman and Corneth* is divided into two 48K Spectrum adventures. You are the dreamer seeking only the magic to wake up. There are

searching for clues in a mainstream of mental illness to take up, there are quality graphics illustrating most of the stuff that dreams are made of, and a rich vocabulary.

The Bait

The *Popular Computing Weekly* school of hack psychology and fringe religion invites you to win five copies of the *The Sardinian Corneth*. First prize will consist not only of the game itself but also a bottle of

vintage champagne!

Venture into 1985 with sparkling fastbuds and a contented expression. Ten runners-up will receive a useful Spectrum toolkit utility program from Star Dreams, creators of *The Sandman*.

What to do

The *Sardman Cornish* is no ordinary program and to win it you'll have to complete no ordinary competition. In each of the next two weeks' issues (December 13 and 20) we will be publishing a

rhyming couplet somewhere in Adventure Hepline.

for a game that combines a quiz with an adventure. Complete the clues, explore the adventure make use of the enigmatic advice offered in the two rhyming couplets and you'll hear a tune.

ne.

If you think you know the tune, name it, with a brief explanation of what you did to discover it (you can't get it just by looking at the listing incidentally) and send the details to Sandman Competition, *Popular Computing Weekly*, 12-13 Little Newport Street, London WCH7PP by 1 February 1985. The first 15 senders of correct entries get the prizes and the editor's decision (as usual) is final.

How to enter



★ CRASH SMASH ★

HOME COMPUTING WEEKLY
FIVE STAR RATING

► SUPERB MOVING STAR EFFECTS ■ IT BECAME OBVIOUS THAT THIS WAS SOMETHING SPECIAL ■

PERSONAL COMPUTING GAMES ★ ★ ★
PCG HIT ★ ★ ★

▶ I FOUND IT EXCITING AND
COMPPELLING AND KEPT WANTING TO
HAVE JUST ONE MORE GO ■

Mail Order enquiries and
catalogue of other titles:-
2, Ashton Way,
East Herrington,
Sunderland SR3 3RX

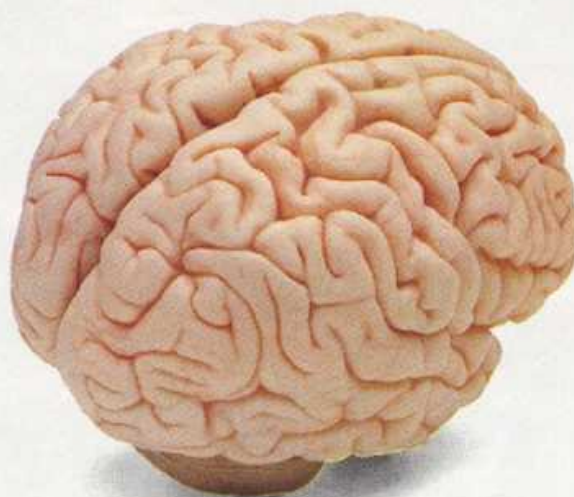


ADK RATS

DRAB RAT

Our new software

makes the most of yours.



By any standards, the Activision Designer's Pencil is a unique piece of software. With it, you can design, draw, plan.

You can draw the world and everything that's in it.

And then set it to music.

You can produce complex designs in no less than sixteen different colours.

You can write and develop your own programs, without having to understand Basic.

You can do all this with a joystick.

But then you've only scratched the surface.

As you use the Pencil, it will reveal the full potential of your computer, in the most entertaining way possible.

£11.99 might be a lot to pay for a pencil.

But not this one.

When you've done zapping the world, rebuild it with the Designer's Pencil.

Its scope is as broad as your own mind.

 **ACTIVISION**[®]
Your computer was made for us.

£11.99 Commodore 64, £9.99 Sinclair Spectrum. Available soon for all popular systems.

FROM SELECTED BRANCHES OF BOOTS, JOHN MENZIES, AND GOOD COMPUTER SOFTWARE STORES EVERYWHERE.

Are you only using

To only play games on a Commodore

computer is like asking Albert Einstein to work out

the square root of four.

The computer's brain barely ticks over.

To really stretch it, you need more interesting

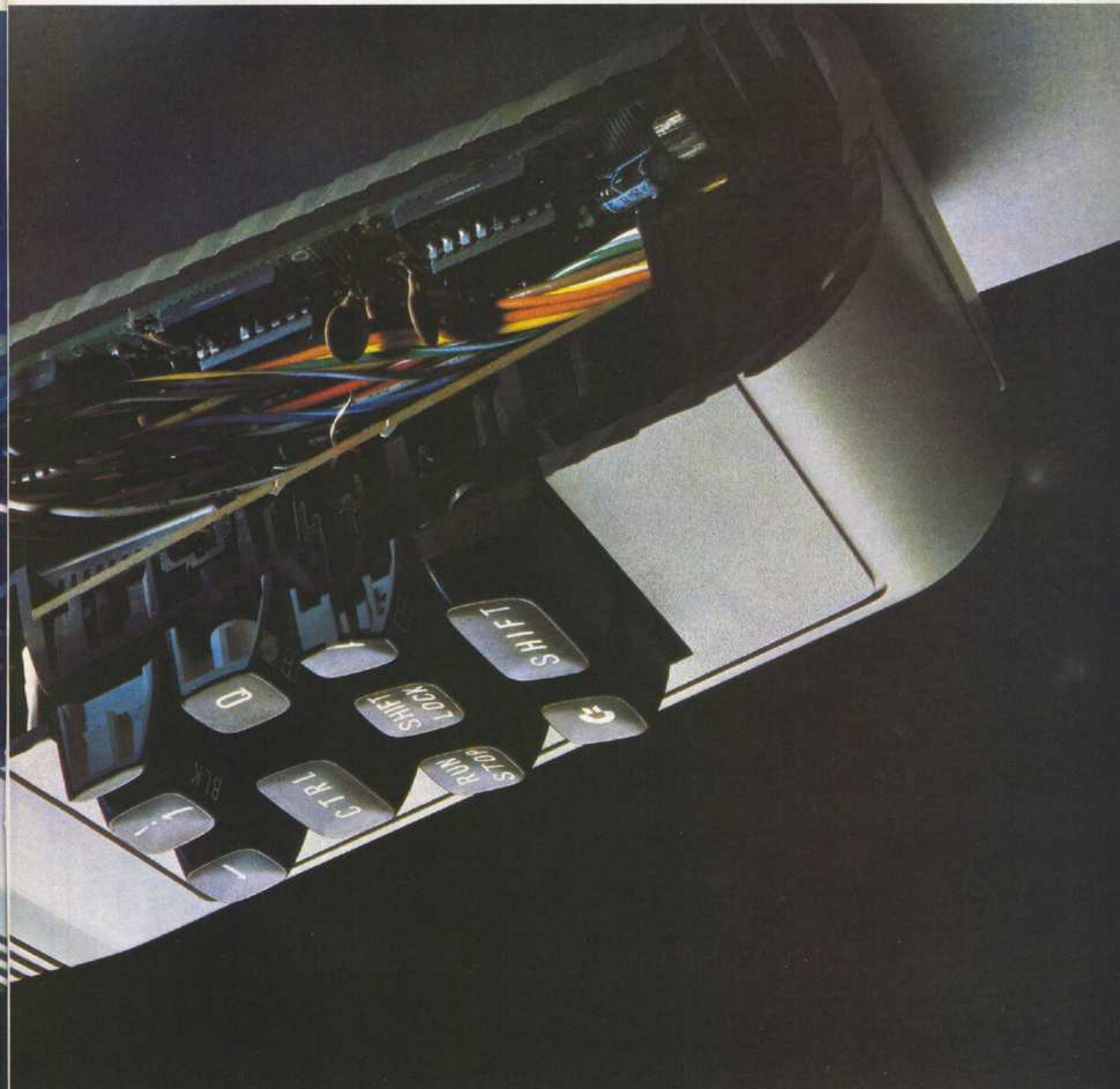
software programs. For example, record keeping,

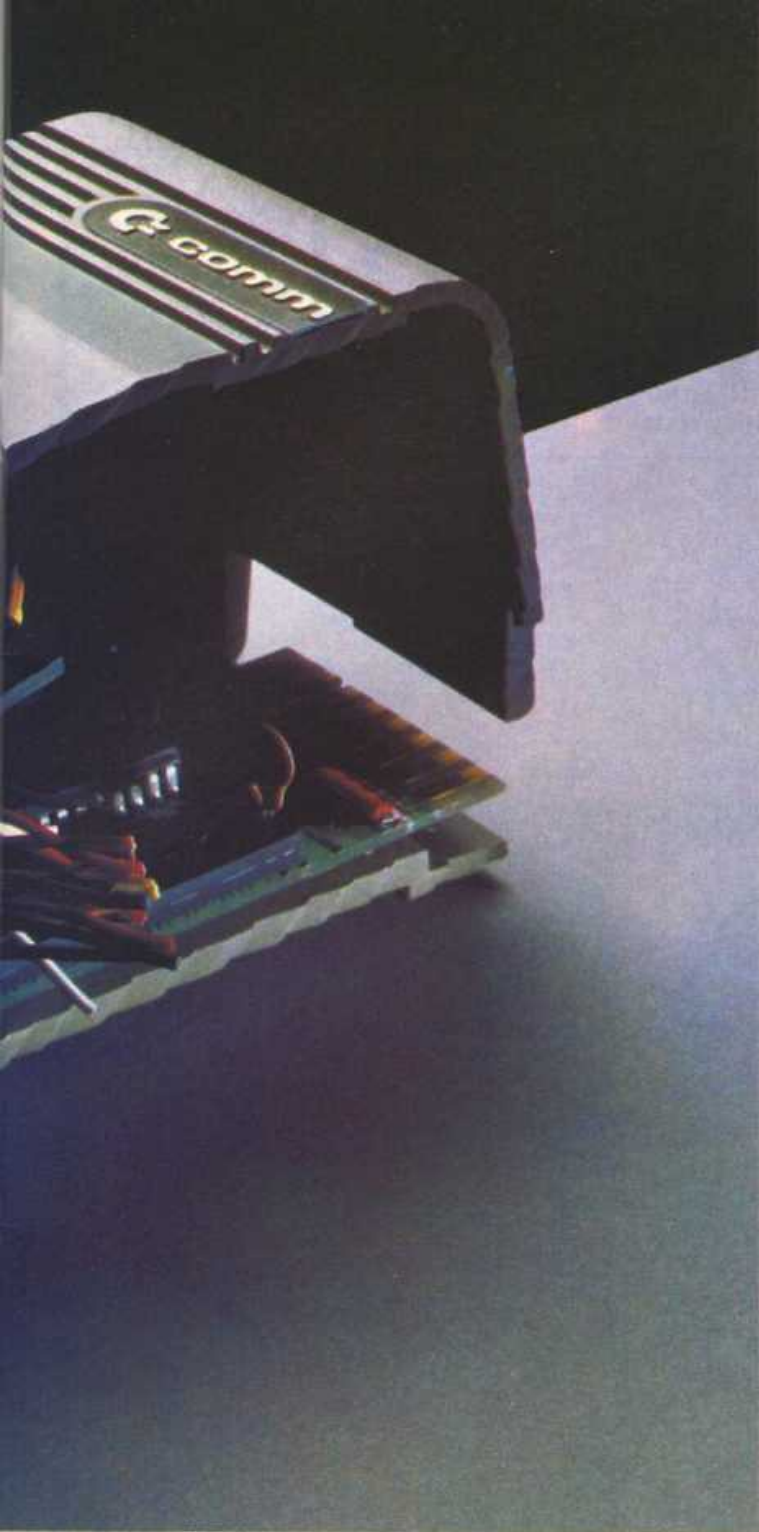
interactive education, stimulating adventure games

or word processing.

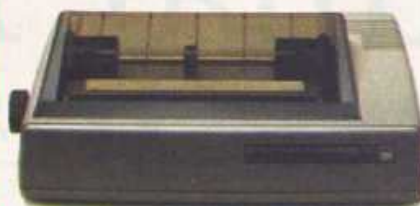
Like a Commodore disk drive, a really fast storage and retrieval system with a vast memory. Or a Commodore cassette unit, the inexpensive way of loading and storing programs. For those who like the idea of text and graphics being more alive and having greater clarity than on a TV, there's the Commodore colour monitor.

And for those you need peripherals.





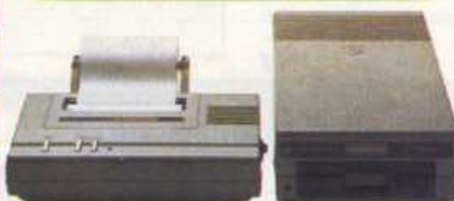
COMMODORE MPS801 ☐
Dot matrix printer. £230.00.
Tractor feed. Print speed:
50 characters per second.



COMMODORE MPS802 ☐
Dot matrix printer. £345.00.
Friction feed for standard
paper. Print speed:
60 characters per second.



COMMODORE DPS1101 ☐
Daisy wheel printer. £399.99.
Letter quality print on
standard paper. Print speed:
18 characters per second.



COMMODORE 1520 ☐
Printer/plotter. £169.99. For
charts and graphs. Print speed:
14 characters per second.

COMMODORE 1541 ☐
Disk drive. £229.00.
170K memory, 5 1/4" diskette.



COMMODORE 1531 ☐
Cassette unit. For Commodore
16 and Commodore plus/4.



COMMODORE 1530 ☐
For Commodore 64.
£44.95 each.

COMMODORE 1701 ☐
Colour monitor. £230.00.

JOYSTICKS ☐
(prices from £7.50)

PADDLES (£13.50) ☐

Details correct at time of going to press.

1/10th of your brain?

And for hard copy, there are our four printers and a printer/plotter. These will preserve on paper—in colour, black and white, chart form, graphs or text, the fruits of all your labour.

Finally, for more exciting games, there are joysticks and paddles.

So use your brain. And make sure you use all of your computer's brain.

FOR FURTHER INFORMATION, TICK ONE (OR MORE) OF THE BOXES ABOVE AND SEND TO THE COMMODORE INFORMATION CENTRE, 1 HUNTERS ROAD, WELDON, CORBY, NORTHAMPTON NN17 1QX. TEL: CORBY (0536) 205252.

NAME

ADDRESS

PE PCY 1384



commodore

BY SUBSCRIBING TO THIS MAGAZINE
YOU AGREE TO ACCEPT THE TERMS AND
CONDITIONS OF THE PUBLISHER'S GENERAL
TERMS AND CONDITIONS OF SALE.

Lunar Module

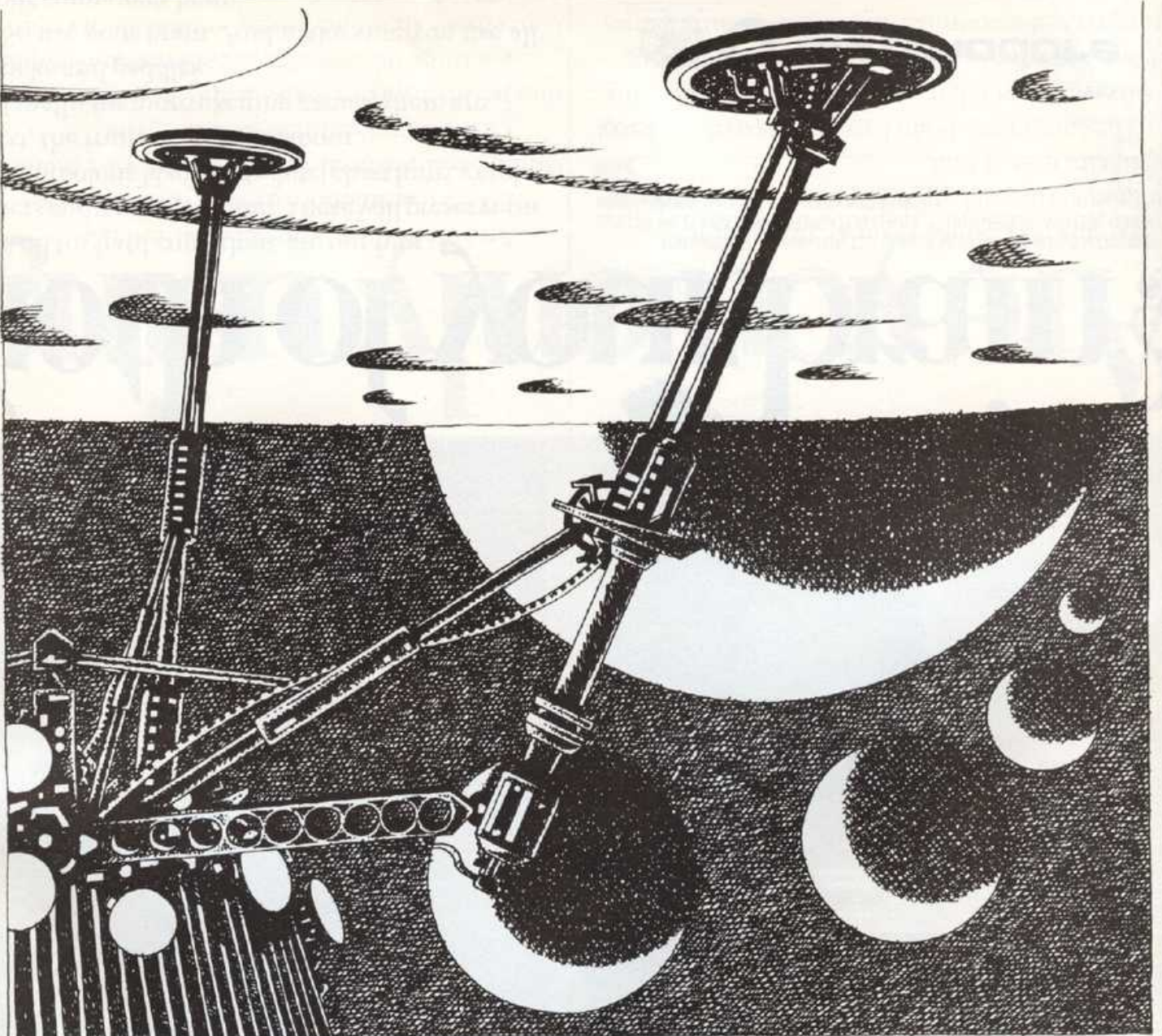
Your chance to make that giant leap for mankind on the Dragon 32 by Ashley Watson

This program simulates the landing of a lunar module on the surface of a planet. The speed at which the craft falls, etc., is quite accurate because a number of equations are used—Lines 3030 to 3090—which calculate fuel used, fuel left, mass of module, velocity and height above the planet's surface. On a successful landing, the speed at which the landing took place will be shown. Full instructions are shown within the Dragon

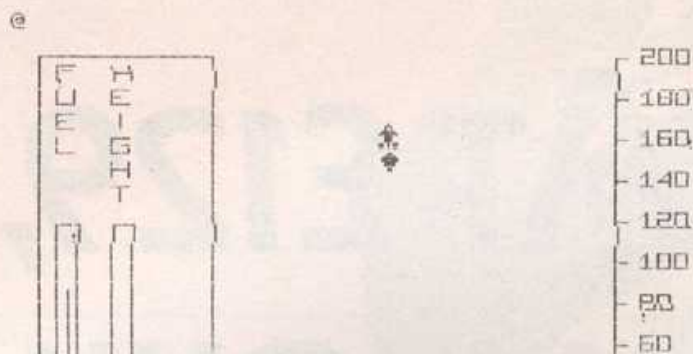
Program Notes

Lines
10-210 Initialise
1000-1120 Main loop
2000-2090 Check keyboard
3000-3100 Calculate
4000-4050 Delay
5000-5140 Crash/land routines

6000-6150 Display instruments
6160-6250 Print space ship
7000-7040 Draw landscape
8000-8130 Instructions
8500-8560 Another go?
9000-9300 Used to set up display
9310-9390 Data for letters, numbers and machine code



THE FOLLOWING IS A SCREEN DUMP OF THE PROGRAM



```

10 REM
20 REM initialise
30 REM
40 CLEAR 100,32700
50 DIMW$(26),NU$(10),R(10),R1(10),R2(10),R3(10)
60 FORA=1 TO 26:READW$(A):NEXT
70 FORA=1 TO 10:READNU$(A):NEXT
80 PCLS:FORA=0 TO 10:READ DA:POKE1536+(A*32),DA:NEXT
90 FORA=0 TO 7:READ DA:POKE1538+(A*32),DA:NEXT
100 FORA=32701 TO 32738:READB:POKEA,B:NEXT
110 GET(16,0)-(24,8),R2,6
120 GET(0,0)-(8,10),R,6
130 GET(100,100)-(108,110),R1,6
140 GET(100,100)-(108,108),R3,6
150 GOSUB 8000:GOSUB9000
160 V1=100
170 H1=1000:H=H1
180 F1=500
190 M1=2500
200 MU$="L80T80V31AV25BV20CV15D"
210 CR$="01T255L255BAG"
1000 REM
1010 REM main loop
1020 REM
1030 GOSUB 6000
1040 GOSUB 2000
1050 IF H1<1 THEN 5000
1060 GOSUB 3000
1065 IF H1>1000 THEN CLS:PRINT" THE
PLANET IS NOW OUT OF RANGE
DUE TO OVER THRUSTING.
MISSION FAILED":GOTO8500
1070 GOSUB 4000
1080 IF H>=200 AND H1<200 THEN F4=1
ELSE F4=0
1090 IF H<=200 AND H1>200 THEN F5=1
ELSE F5=0
1100 IF F5=1 THEN C=1000:GOSUB 9210
1110 IF F4=1 THEN C=200:GOSUB 9210:GOSUB70
1120 GOTO 1030
2000 REM
2010 REM check keyboard
2020 REM
2030 A$=INKEY$:IFA$="" THEN 2070
2040 J=ASC(A$)
2050 IF J<48 OR J>53 THEN 2070
2060 K=J-48:GOTO2080
2070 K=0
2080 IF F2>0 THEN F=K*10000 ELSE F=0:K=0
2090 RETURN
3000 REM
3010 REM calculate
3020 REM
3030 V=V1:H=H1:F2=F1:M=M1
3040 A=(F/M)-2
3050 V1=V-A
3060 H1=H-V
3070 U=(F/50000)*50
3080 F1=F2-U
3090 M1=M-U
3100 RETURN
4000 REM
4010 REM delay / print thruster
4020 REM
4030 IFK(>0 THEN PLAY MU$:FL=E6+2:FM=
E6+10:PUT(128,FL)-(136,FM),R2,PSET
ELSE FL=
0:FM=0
4040 FORB=1 TO 300:NEXT B
4050 RETURN
5000 REM
5010 REM crash or land
5020 REM
5030 IF V1<5 THEN 5100
5040 REM
5050 REM crash routine
5060 REM
5070 FORQ1=1 TO 13:CIRCLE(130,175),Q1:
PLAY CR$:NEXT Q1
5080 FORQ3=13 TO 1 STEP-1:CIRCLE(130,
175),Q3,0:PLAY CR$:NEXT Q3
5085 CLS:PRINT"YOU CRASHED AT A SPEEDOF";Z

```

continued on page 20

At £129,

LOOK HOW THE

ATARI 800XL

LICKS THE

COMPETITION.

At last, serious home computers are up against serious competition. The ATARI 800XL

offers everything other competitors in their price range offer. And, as you can see above, a great deal more.

No other computer makes your tongue hang out further.

ATARI 800XL

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



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 800XL


```

5086 PRINT "METRES PER SECOND"
5090 GOTO 8500
5100 REM
5110 REM land routine
5120 REM
5130 CLS:PRINT "YOU LANDED AT
A SPEED OF";Z
5132 IF Z<0 THEN Z=.1
5135 PRINT "METRES PER SECOND"
5140 GOTO 8500
6000 REM
6010 REM display instruments
6020 REM
6030 X=INT(F1+.5):Y=INT(H1+.5)
Z=INT(V1+.5)
6040 IF Y<0 THEN Y=0
6050 GOSUB 6150:GOSUB 6070
6060 RETURN
6070 REM
6080 REM update fuel/height level
6090 REM
6100 X=X/5.6:Y=Y/12
6110 LINE(39,170)-(39,81),PRESSET
6120 LINE(20,170)-(20,81),PRESSET
6130 LINE(20,170)-(20,170-X),PSET
6140 LINE(39,170)-(39,170-Y),PSET
6150 RETURN
6160 REM
6170 REM update space ship
6180 REM
6190 EB=E6:E7=E7
6200 IF H1<200 THEN YB=Y/1.18 ELSE
YB=Y/5.9
6210 E6=180-YB:E7=170-YB
6220 PUT(128,FL)-(136,FM),R3,PSET
6230 PUT(128,EB)-(136,E9),R1,PSET
6240 PUT(128,E6)-(136,E7),R,PSET
6250 RETURN
7000 REM
7010 REM draw landscape
7020 REM
7030 DRAW "BM80,190M+20,-23M+15,+12M+31,
+0M+5,-13M+4,+5M+7,-3M+9,+20M+5,+2M+12,
-7M+20,+21"
7040 RETURN
8000 REM
8010 REM instructions
8020 REM
8030 CLS
8040 PRINTAB(10); "LUNAR MODULE"
8050 PRINTAB(10); "-----"
8060 PRINT(C) 2/3/84 BY ASHLEY WATSON"
8070 PRINT
8080 PRINT "YOU ARE IN CONTROL OF ONE OF
THE NEW X-ASH-X ROCKETS AND YOU MUST
LAND YOUR ROCKET ON THE
SURFACE OF THE PLANET ASHTRON."
8090 PRINT "TO SLOW THE ROCKET DOWN USE
THE THRUSTERS (KEYS 1 TO 5 -1 ISWEAKE
ST) BEFORE THE FUEL RUNS OUT.
TO LAND SUCCESSFULLY THE SPEED MUST
BE BELOW 5 METRES PERSECOND."
8100 PRINT "HEIGHT IS SHOWN ON
THE RIGHT"
8110 PRINTAB(8) "PRESS ANY KEY";
8120 A$=INKEY$:IF A$="" THEN 8120
8130 RETURN
8500 REM
8510 REM another go ?
8520 REM
8530 PRINTAB(8);
"ANOTHER GO (Y/N)"
8540 A$=INKEY$:IF A$<>"Y" AND A$<>
"N" THEN 8540
8550 IF A$="Y" THEN RUN
8560 END
9000 REM
9010 REM set up display
9020 REM
9030 PMODE4:SCREEN1,1:CLS
9040 DRAW "BM10,10D170R60U170L60"
9050 DRAW "BM16,B0R/D90L/U90BM35
B0R/D90L/U90"
9060 Z$="FUEL":Y=16:Z=20:GOSUB 9110
9070 Z$="HEIGHT":Y=35:Z=20:GOSUB 9110
9090 C=1000:GOSUB 9210
9100 RETURN
9110 REM
9120 REM draw letters
9130 REM
9140 FOR T=1 TO LEN(Z$)
9150 G=ASC(MID$(Z$,T,1))-64
9160 IF G<0 THEN T$=NU$(G+17)
ELSE T$=W$(G)
9170 DRAW "BM"+STR$(Y)+"",+STR$(Z)+T$
9180 IF G<0 THEN Y=Y+6 ELSE Z=Z+10
9190 NEXT
9200 RETURN
9210 REM
9220 REM draw numbers
9230 REM
9240 EXEC 32707
9250 DRAW "BM210,10D170":C1=C/10:F0R
B=10 TO 187 STEP 17
9260 DRAW "BM210,"+STR$(B)+"R4"
9270 Z$=STR$(C):Z$=MID$(Z$,2)
9280 Y=219:Z=B+2:GOSUB 9110
9290 C=C-C1:NEXT
9300 RETURN
9310 DATA "Z","Z","Z","Z","Z","Z",
"U6D3R6B3D6","BM+3,+0U6","NR6B6
"Z","Z","Z","Z","Z","Z","NR6B6
"Z","Z","Z","Z","Z","Z","NR6B6
"Z","Z","Z","Z","Z","Z","NR6B6
9320 DATA "R4U6L4D6","R4L2U6G2"
9330 DATA "NR4U3R4U3L4","R4U3L4U3R4
9340 DATA "BM+4,+0U6M-4,+4R4","R4U3L4U3R4
9350 DATA "R4U3L4D3U6R4","BM+4,+0U6L4"
9360 DATA "U6R4D6L4U3R4","BM+4,+0U6L4D3R4
9370 DATA 16,56,40,124,254,56,56,214,
214,214
9380 DATA 24,60,126,126,60,24,24
9390 DATA 22,6,9,29,223,0,166,140,252,
16,174,140,244,31,33,95,167,132,92,225,
140,234,34,4,48,1,32,244,49,168,32,16,
172,140,224,37,232,57

```


DRAGON SOFTWARE

SALE



£1.99

CECIL PLAYS - LOADING THIS PROGRAM - ALL WEIRD OUT CECIL THE FROG AND SAVING THE WORLD - HE LOVES WORKING AND BATES LOADING AND WILL TELL YOU SO - HE'LL LAUGH AT YOU, GRIN AT YOU AND IF YOU TAKE ALL HIS MONEY WORTH OUT!

SNIP



£1.99

TELEPATH - A STUNNING NEW CONCEPT FROM GILL. DO YOU WANT FURTHER POWER? WRITE TELEPATH WILL HELP YOU FIND OUT! THIS VERY SPECIAL PROGRAM INCLUDES A SHORT AUDIO HISTORY OF PARASTROLOGY, A GRAPHIC DEMONSTRATION & OF COURSE THE S.W.F. TEST, PLUS MANY MORE NEW AND EXCITING FEATURES!

SNIP



£1.99

CRAPS - AN INCREDIBLY ADDICTIVE GAME WILL KEEP YOU HOOKED FOR HOURS. FOLLOW THE DICE AND TRY TO BREAK THE BANK. FREE ROULETTE GAME ON SIDE 2.

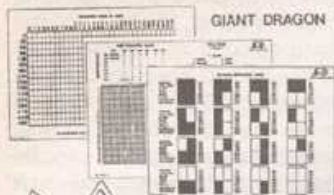
SNIP



£1.99

MURDERINGLY - CAN YOU SURVIVE ON MURDERINGLY ISLAND? TRAVE AS THE VILLAGEY, TRANSPORT YOUR GOODS, BITE AND FEED KNOWN PORTENTS, GET ON WELL WITH THE WITCHDOCTOR, AVOID THE HAZARDS, YETI, ALLIGATORS, TIGERS, HARMEDSHEEP, ALL THOSE AND MANY MORE ADVENTURE AWAITS YOU ON MURDERINGLY ISLAND!

GIANT DRAGON PROGRAMMERS CHARTS



All Snip Products

Stock Clearance

£1.99

OR
ALL FOUR CASSETTES
For Just £6.50
OR
CHARTS & 4 TAPES
£7.50

FOR FAST DESPATCH
Cheques P.O.s to SNIP SOFTWARE LTD
P.O. BOX 20 WOKING SURREY GU21 3QN

LIGHT TO THE POINT



SPECTRUM 48K/COMMODORE 64

£17.25

DRAGON/TANDY

£11.50

inclusive
NO INTERFACE REQUIRED

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

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

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

For educational or leisure use.

DEALER ENQUIRIES WELCOME

TROJAN

Micro Computer Software & Accessories

Send cheque/P.O. to:
TROJAN PRODUCTS
166, Derlwyn, Dunvant, Swansea SA2 7PF
Tel: (0792) 205491.

RAM MAKE MORE OF YOUR SPECTRUM...

Two great new add-ons to boost the power of your Spectrum (and Spectrum Plus).

The Ram Interface Mk.II

is Kempston

compatible. It lets

you get the best

out of your action

games, with all

the best

joysticks around

- even the

Quickshot II rapid

fire joystick. Electrify

your enemies, with real

power and lightning-fast reactions

at your fingertips.

JOYSTICK
INTERFACE MK II



£9.95

£21.95

Then there's our Spectrum Upgrade Kit. Boost your 16K memory to a fantastic 48K and run all the latest superb action software.

SPECTRUM
UPGRADE KIT



...FOR LESS.

(Both Ram products are made to last. And fully guaranteed.)

Get some real action into your Spectrum Games today!

Simply return the coupon below to Ram Electronics (Fleet) Ltd., Dept. PCWk., 106 Fleet Road, Fleet, Hampshire GU13 8PA. Or call our credit card hot line on 02514 25252.

Please send me

Spectrum Joystick Mk.II Interface(s) at £9.95.

Quickshot II rapid fire joystick(s) at £9.95.

(only when purchased with interface. Normally £12.95)

Spectrum Upgrade Kit(s) at £21.95.

(Please add £1 p+p for UK orders. £3 p+p for Europe)

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

Expiry date

Name

Address

Postcode

Telephone

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

Trade and export enquiries welcome





Richard Corfield

only inform, they question — making you think through your understanding of the play.



The program gives you only the references which link all the names or concepts selected. Each reference gives you the Act, scene and line in the play so that you can refer to the original text, and it also provides a paragraph of comment, which points out the particular significance in the play of this reference. The comments not



Tony Kendle

The game itself is well programmed by Five Ways Software, but is let down slightly by the graphics. Doubtless they accurately reflect the speed of the yacht but a lot of the time there seems to be nothing happening at all — more detail is needed to keep the display interesting. The only exception is the computer controlled boat which disappears so rapidly into the horizon that you can't help wondering whether it cheats. For those good enough to give it a real race the game must be much more exciting, but I found it a bit too pedestrian and pricey to have more than a limited appeal.

qualified as is, I am truly not
presented as is, however, the
as would be expected from a
publishing company, excellent
supporting documentation and
maps. Unfortunately, this is ac-
companied by a pretty exces-
sive price tag. They have also
thoughtfully provided a save to

tenity, loyalty, kingship. You select the character or topic of interest to you using an easy-to-use search menu, and the program will then present you with a series of references to the chosen subject. If you select more than one subject,

Educational software needs to be treated with some caution. I often have the feeling that you would be better off spending your money on a good textbook, rather than a computer program of debatable benefit. However, the Penguin Study Software Series of study aids for Shakespeare's plays overcomes my reservations, from the evidence of the program for *Henry IV Part One*, anyway. The program works like a small database system containing references to a number of key characters and topics relevant to the play, eg Falstaff, Hal,

Program Henry IV Part I MLC
gro Commodore 64 Price £7.95
Supplier Penguin Books, Har-
mondsworth, Middx

insight

Hill MacGibbon have given their range the title 'Games that stretch the mind' and it is in the area of 'education' that I give this highest marks. For a confirmed landlubber like me, it's a real pleasure to develop an easy familiarity with terms like tacking and gybing and to be honest there's a much greater chance that such gems will be put to practical use in a real boat than the hours of practice put in on *Fighter Pilot* ever will. How accurate a representation of the behaviour of a real

Price £9.95
Micro Spectrum 48K
Supplier Hill MacGibbon, 92 Fleet St, London EC4Y 1DH.

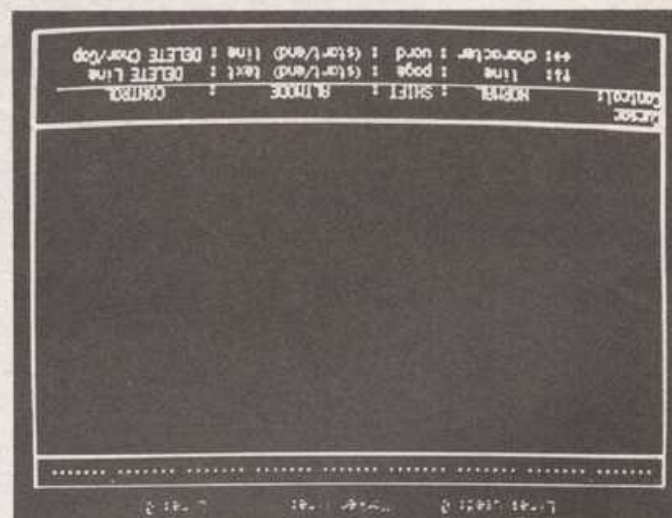
Landlubber



Andrew Pennell

The assembler is non-standard, as is Metacomco's, but works quickly. Compared with Metacomco's, it's a case of you pay your money, you takes your choice, but the QL assembler market is about to get very crowded — I have just got the official Sinclair one, and two others are also imminent. With all these assemblers available for the QL, why doesn't some other software come out for it?

The editor is OK, but, it was converted to machine-code with error trapping it would be



The assembler itself is all most of Motorola standard—it doesn't need the *Quick* or *Ad-dress* operands in its instructions, and adds them itself, but strangely rejects any instructions that actually specify them. It also has a non-standard way of defining data, using 2800000000000000 instead of 6800000000000000 and always requires colons after its symbols for some strange reason.

The assembler is thankfully written in machine-code and runs as a proper job, so would run concurrently with the editor if it didn't insist on *Newing* itself. It asks for three file-names, for the source, the object code, and the listing, then gets on with it. It is fast, with none of the overplaying problems I experienced for example on the Metacomco assembler.

entered a program and saved it, it would be useful to have an option in the editor to load the

My preliminary instructions didn't mention what to do after it crashes out — which it did quite often. After contacting the authors, they came back to me with a `GoTo` command that would re-start it.

The editor itself has the best of features, and though it has a (slow) search facility, it does not have a search and replace option which, because of its non-standard syntax, is rather necessary if using files from other assemblers. Having

The editor is actually written in SuperBasic, which has its advantages and disadvantages. The advantages are that it is easy to write and debug, but the disadvantage is the complete lack of crashproofing. Note that I have not mentioned speed, as it is not really noticeably slow — in fact, it is still faster than Psion's *Quill*. The problem occurs when you

Program QL Machine-Code Editor/Assembler Micro QL
Price £29.95 Supplier McGraw Hill Book Company, Maidenhead, Berkshire.

Bombs out

Reviews

★ NOW AVAILABLE FOR THE AMSTRAD CPC 464!!

WIN THE POOLS?

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

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



- Supplied with Database containing data on over 10,000 matches since 1980!
- You update the Database each week – but no tedious typing, as team and division names already in program!
- Errors easily corrected – the program even checks your entries!
- Comprehensive instruction manual and menu driven program – easy to use, even for a newcomer to computing!
- Will forecast the least likely draws for those who prefer to bet on fixed odds!
- Built in perm generator – complete your coupon direct from the screen!
- Fully microdrive compatible! (Spectadraw only).
- Compatible with Currah Microspeech – the first pools program to read you its predictions! (Spectadraw only).

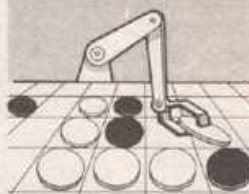
Spectadraw 3 for the 48K Spectrum£9.95 inclusive
Amstra-Draw for the Amstrad CPC 464£9.95 inclusive
(Cheques/P.O.s payable to B. S. McALLEY)

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

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

AMSTRAD CPC 464 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.

Send cheque/P.O.'s payable to ...

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



ADD REAL GAMES POWER TO YOUR ELECTRON.

Electrify your enemies. Terrorise marauders. Zap the invaders from Zog using the power of the new Ram Electron Interface.

Ram's interface puts real games power at your fingertips – it lets you use all the best joysticks around, like the rapid-fire Quickshot II.

What's more, it works with all First Byte compatible software, and comes with a free software conversion tape that suits almost any other software.

And it's made to last – we reckon it's the most reliable you can buy anywhere.



ELECTRON JOYSTICK INTERFACE

£17.95

Get some real action into your Electron games today! Just return the coupon below to Ram Electronics (Fleet) Ltd., Dept. PCWk., 106 Fleet Road, Fleet, Hampshire GU13 8PA. Or call our credit card hot line on 02514 25252.

Please send me

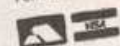
..... Electron Joystick Interface(s) at £17.95.

..... Quickshot II rapid fire joystick(s) at £9.95.

(only when purchased with interface. Normally £12.95)

(Please add £1 p+p for UK orders. £3 p+p for Europe)

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



Expiry date

Name

Address

Postcode

Telephone

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

Trade enquiries to Vulcan Electronics Ltd. (01-203 6366)
Export enquiries to Ram Electronics.

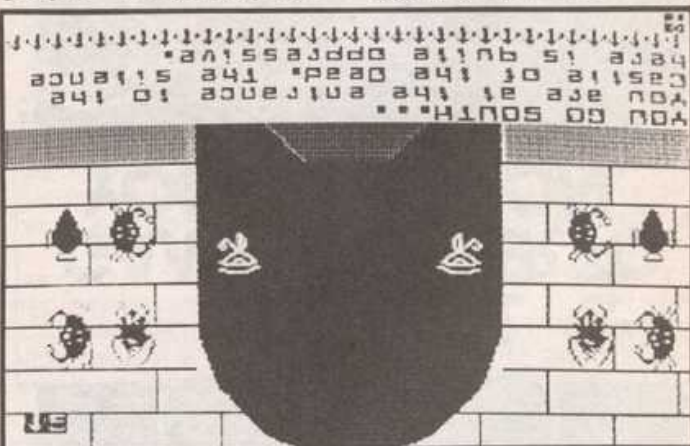


Sounds good

Program Se-Kaa of Assiah
Price £2.99 Micro Spectrum
48K Supplier Master Vision,
Park Lorne, 111 Park Road,
London NW8 7JL

There's also far better use of sound than in most adventures (fall off a path and see what I mean).

What is lacking is content. With a good number of rooms, all made up of the same elements, a sense of repetition soon sets in. There are too,



MasterVision is Master-Se-Kaa came in a video case label, and my copy of the micro's up-market with accompanying booklet. It's an adventure with illustration—or rather it's a mainly illustrated adventure, in two parts. The first is to find various sacred objects in the Castle of the Dead, which is haunted by the Dark Hordes. These objects then have to be returned to their rightful places. In a week which has produced many good new adventures this one is in some ways, a disappointment. The illustrations are rather good, with animated flames on the torches and a useful compass indicator at the top of every scene.

Program Smash and Grab Micro Electron Price £7.95 Supplier Superior Software, Regent House, Skinner Lane, Leeds.

Ever fancied robbing a bank with the knowledge you have three chances of getting away with millions of pounds? Well, here is your chance. You may have three chances and there may only be one policeman chasing you, but there are also floating dustbins and flying police-cones to contend with.

To explain: first you kick a

Get your kicks

Many empty places—in fact I was left wondering whether I'd missed something, but didn't have the incentive to go back and find out what. As for the Dark Hordes, I kept getting warnings that they were following me but never met them. Sad, because a good bit of the tedious slaughter would have relieved the tedious.

There's undoubted programming talent behind this game, but it's all rather like a picture book without a story. Obviously for the price it's no rip off and is certainly worth a look if you're an absolute addict.

John Minson

Program Smash and Grab Micro Electron Price £7.95 Supplier Superior Software, Regent House, Skinner Lane, Leeds.

Ever fancied robbing a bank with the knowledge you have three chances of getting away with millions of pounds? Well, here is your chance. You may have three chances and there may only be one policeman chasing you, but there are also floating dustbins and flying police-cones to contend with.

To explain: first you kick a

Program Smash and Grab Micro Electron Price £7.95 Supplier Superior Software, Regent House, Skinner Lane, Leeds.

Ever fancied robbing a bank with the knowledge you have three chances of getting away with millions of pounds? Well, here is your chance. You may have three chances and there may only be one policeman chasing you, but there are also floating dustbins and flying police-cones to contend with.

To explain: first you kick a

Program Smash and Grab Micro Electron Price £7.95 Supplier Superior Software, Regent House, Skinner Lane, Leeds.

Ever fancied robbing a bank with the knowledge you have three chances of getting away with millions of pounds? Well, here is your chance. You may have three chances and there may only be one policeman chasing you, but there are also floating dustbins and flying police-cones to contend with.

To explain: first you kick a

Cat-napping

Program Show Crazy Price £3.95 Micro Spectrum 48K Supplier Ssoft, 298 Manchester Road, West Timperley, Altrincham, Cheshire WA 14 5NB.

Lost—Ginger Cat—Answers to the name of Purrrfect Pest—Reward. I can't think of any other quests to find lost moggies, but that's the theme of this adventure and it makes a pleasant change that the worst that can happen to you are fractures. Obviously, to add a sense of urgency to the cat hunting, calls for an incentive—in this case it's the impending show.

Harping on

Program Jack and the Beans Supplier Superior Software, Dept C, Regent House, Skinner Lane, Leeds

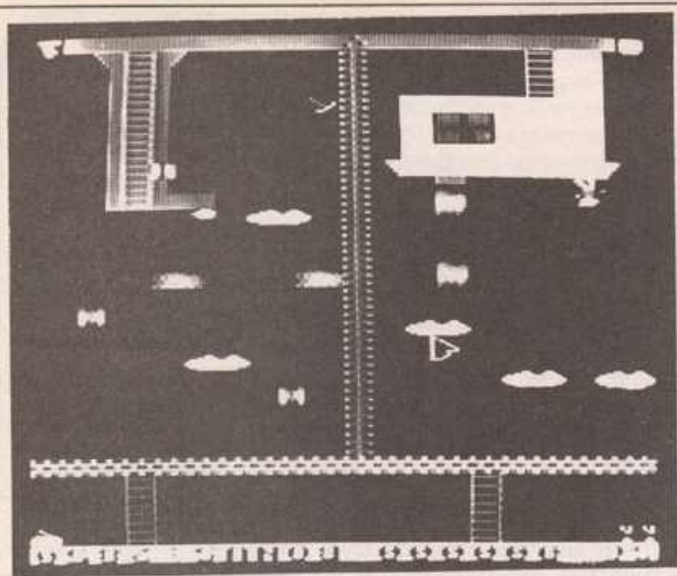
The fairytale of Jack and his adventures with a magic beanstalk is the best game from Andrew Harvey's latest game from Superior Software. To be cruelly analytical it is a ladders and platforms game—but a first-rate variation on the theme. You control (from the keyboard only) Jack's movements which are fast and well animated. Climbing the beanstalk is not as easy as it looks—grabbing golden eggs and harps (could Guinness have been an inspiration?) and

John Minson

Hints as to where the elusive feline has been abound, adding to your frustration, and even when he's found and captured you still have to get him to the show. At heart *Show Crazy* is a rather obviously *Quill-ed* effort, despite the addition of somewhat primitive graphics. While experienced adventurers will romp through it, it should suit the less experienced player. Its novel subject and light tone make it highly playable and while it is a little overpriced it should provide a well-priced it should provide a well-

above all...the Giant's bags of gold. As per the original story, the Giant gets upset and pursues you very rapidly indeed. Dodging is extremely hard and the recommended escape is to shin down the beanstalk and grab an axe to cut off his descent. A fresh beanstalk will grow to let you try for more. There are an assortment of other dangers to dodge while this all goes on. Smoke blowing dislodged you from the beanstalk. Snails attack you in the Giant's lair. If you're quick, though, you can dig holes to kill off the snails and slow down the big himself. It may not be the most novel of programs but it is actually quite a fine game.

Dave and Jan Watterson



The Chart
Topping
Flight Simulation
Now On
CBM 64.

ALSO
AVAILABLE ON
THE 48K SPECTRUM

FREE COLOUR
POSTER AVAILABLE
WITH DISK VERSION

FIGHTER PILOT

BY D.K. MARSHALL
ADAPTED BY DARRELL D.

COMMODORE 64

A SPECTACULAR FLIGHT
SIMULATION OF THE
WORLD'S MOST EXCITING
JET FIGHTER WITH
STUNNING 3D COCKPIT VIEW
AND DEADLY 3D AIR TO AIR
COMBAT.



The SUPREME SIMULATION
it leaves the rest at the runway
threshold!

COMMODORE 64.

Fighter Pilot Disk ☐ £14.95
Fighter Pilot Cassette ☐ £9.95

SPECTRUM

Night Gunner 48K ☐ £6.95
Fighter Pilot 48K ☐ £7.95

Tomahawk 48K ☐ £7.95
TT Racer 48K ☐ £7.95

VAT and p. & p. inclusive within UK
(Overseas inc. 55p. per cassette)

Trade and Export enquiries
welcome. Lifetime Guarantee.

Cheques payable to Digital Integration Ltd

I enclose a cheque/P.O. for _____ Total

Name _____

Address _____

Or debit my Access Account No.

Please send to Digital Integration, Dept
Watchmoor Trade Centre, Watchmoor Road, Camberley, Surrey GU15 3AJ.

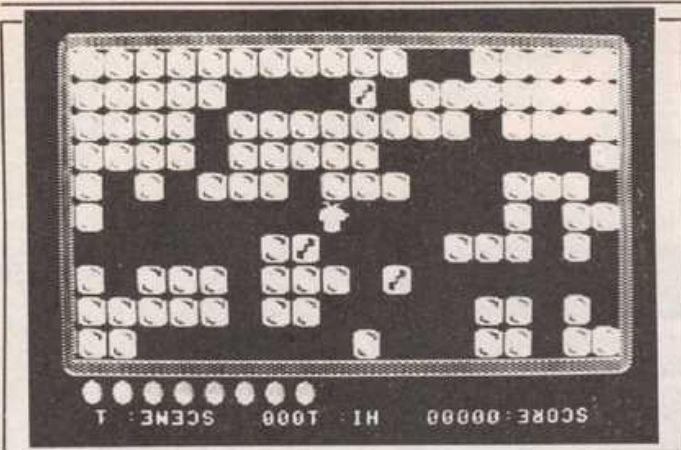


Tele Sales
(0276) 684959

DIGITAL
INTEGRATION

Watchmoor Trade Centre,
Watchmoor Road,
Camberley, Surrey
GU15 3AJ





Richard Corfield

Each game opens with Zany Kong being winched in his cage to the top of the screen, accompanied by appropriate music which plays throughout the game. As usual your task is not easy — involving climbing up a series of ropes or vines preferably in your way are cree- ples called snapers, and aar-dark birds — whatever they are, I always thought the aar-dark was related to the pig fa- rily — which seem to commu- nate down the vines in an er- ratic manner as though they know just what your next move is. Obviously Kong games are still very popular. This version for the Electron must rank as one of the best for the machine. Fred Short



red, making this now look very average. Unfortunately for Percy, there are some deadly Sno-bees in the maze with him. The only way he can survive is to avoid contact with the Sno-bees, and to crush them when he gets the chance by throwing some of the ice cubes at them. If he disposes of all of them, another lot appear and he has to start all over again.

The game lacks any really striking features to distinguish it from many other similar games — often with better graphics, greater variety, more features, or just more of a challenge. Unfortunately, in the last year or so, a great many really excellent games have appeared. The simple, but effective, with the uncomplicated action, sound and the smooth and colourful graphics, together would have seemed very good then available for the 64. The small number of decent games compared to the relatively have seemed pretty good 18 months ago, it would published about a year or I Percy Penguin had been a Commodore 64 Price £7.95

Program Zany King Junior Micro Electron Price £7.95 Sup- piler Superior Software, Re- gent House, Skinner Lane, Leeds

Frozen

Program Percy Penguin Micro Commodore 64 Price £7.95 Sup- piler Superior, Ground Floor, Regent House, Skinner Lane, Leeds. I Percy Penguin had been published about a year or 18 months ago, it would have seemed pretty good compared to the relatively small number of decent games then available for the 64. The simple, but effective, with the uncomplicated action, sound and the smooth and colourful graphics, together would have seemed very good then. Unfortunately, in the last year or so, a great many really excellent games have appeared.

There are three games to be completed. Fags have to be placed on one side of a line in positions that mirror those already on screen, after which a mirror jigsaw has to be constructed. Finally sections of geometrical patterns have to be shifted into place. The first time the child has the help of a grid, but for the second he or she is strictly on his or her own — even adults will find this tricky. Finally a score, plus high score, are displayed. Four different types of mirror are available — diagonal being particularly tricky. Three 'speeds' are also available, giving a longer or shorter search of perfect balance.

Program Zany King Junior Micro Electron Price £7.95 Sup- piler Superior Software, Re- gent House, Skinner Lane, Leeds

Erratic

continued on page 32

There are three games to be completed. Fags have to be placed on one side of a line in positions that mirror those already on screen, after which a mirror jigsaw has to be constructed. Finally sections of geometrical patterns have to be shifted into place. The first time the child has the help of a grid, but for the second he or she is strictly on his or her own — even adults will find this tricky. Finally a score, plus high score, are displayed. Four different types of mirror are available — diagonal being particularly tricky. Three 'speeds' are also available, giving a longer or shorter search of perfect balance.

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Shattered

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Program MacMan's Magic Mirror Price £9.99 Mirror Spectrum 48K Supplier Sinclair Research Limited, Stanhope Road, Camberley, Surrey GU15 3PS

Ingenious...



THE COMPUTER EDITION OF

Waddingtons

MONOPOLY

Registered Trade Mark of Waddingtons Games Ltd.

MONOPOLY

Registered Trade Mark of Waddingtons Games Ltd.

PROPERTY TRADING GAME



Registered Trade Mark of Waddingtons Games Ltd.

**For the
Commodore 64**

Software by...

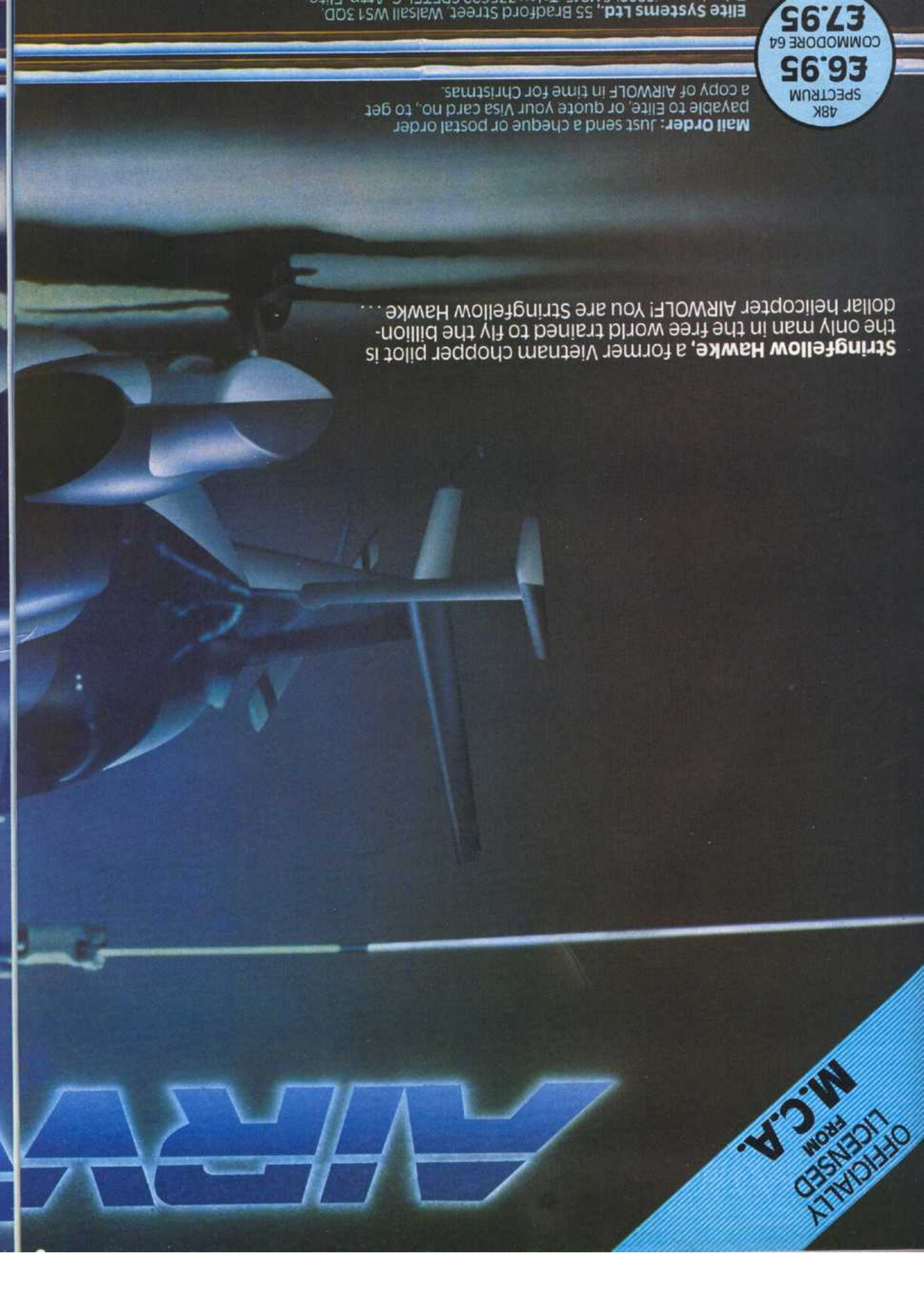
**Leisure
Genius**



3 Montagu Row, London W1H 1AB

The Computer Edition of WADDINGTONS MONOPOLY® IS PRODUCED BY LEISURE GENIUS®
UNDER LICENCE FROM PARKER BROTHERS AND WADDINGTONS GAMES LTD.
THE BOARD DESIGN IS THE TRADE MARK OF WADDINGTONS GAMES LTD. ©ALL COPYRIGHTS RESERVED

(®) REGISTERED TRADE MARK



Stringfellow Hawke, a former Vietnam chopper pilot is the only man in the free world trained to fly the billion-dollar helicopter AIRWOLF! You are Stringfellow Hawke...

Mail Order: Just send a cheque or postal order payable to Elite, or quote your Visa card no., to get a copy of AIRWOLF in time for Christmas.

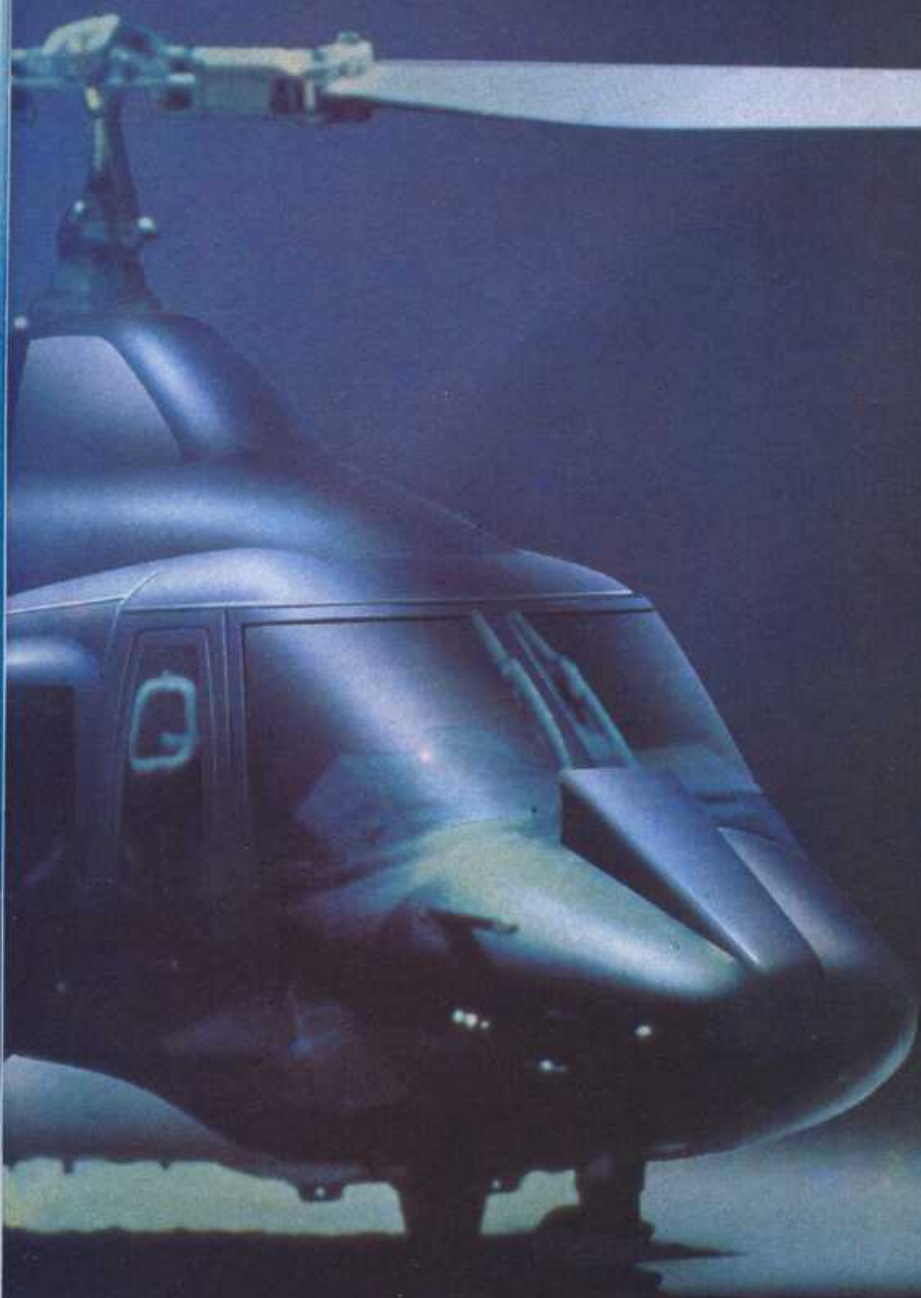
Elite Systems Ltd, 55 Bradford Street, Walsall WS1 3OD.

48K
SPECTRUM
£6.95
COMMODORE 64
£7.95

OFFICIALLY
LICENSED
FROM
M.C.A.

AIRWOLF

VOLFF



elite

Every single Elite product carries the unique Elite Holograph Sticker.
Make sure your copy does – it is your guarantee of quality.

FREE POSTER OFFER

INTERCEPTOR MICRO'S

Lindon House, The Green, Tadley, Hants, England
TEL: (07356) 71145/3711 TELEX: 849101



COMMODORE 64

BENEFITS ON JOINING INTERCEPTOR
SOFTWARE CLUB

1. Up to date information on new releases.
2. Free posters & other promotional aids.
3. Special club member discount.
4. Help club for Interceptor adventure players.
5. Special offers on blank data cassettes.

FREE MEMBERSHIP



VIC 20 SPECTRUM



INTERCEPTOR SOFTWARE CLUB

- ☐ COMMODORE 64
- ☐ VIC 20
- ☐ SPECTRUM
- ☐ AMSTRAD
- ☐ M S X

Please tick your Computer



When you join Interceptor Micro's new software club you will receive free posters. We will also keep you up to date on all our new releases, and include a list of special offers on some of our latest games. Available only to members.

NAME

ADDRESS

EXPLORING THE SENSE OF SOUND!

3 Channel Sound Synthesizer

Any microcomputer is capable of manufacturing sound, however in order to produce a single octave 'C' note with a frequency of 8372 Hz the signal needs attention over 16,000 times per second.



To produce software capable of performing just this one task would be difficult if not impossible, especially when you consider that to produce arcade type sound effects require even greater attention.

The production of these sound effects without the constant attention of the processor is now possible thanks to the AY Sound Chip, its flexibility makes it essential for a wide range of applications including music synthesis and sound effects generation, continuing the monitoring and production of sound after the initial command. More often than not realistic sounds require more than one effect and this function is provided by 3 independently controlled channels, as an example, compare the sound produced by the single note of C, with that produced by the chord 'C' and you will know just what I mean, likewise producing the sound of an explosion using all 3 channels gives games a totally new dimension.

Add to this the ability to alter the pitch tone and shape of the sound you have produced and it's flexibility is unlimited. In simple terms, imagine the note you have produced as a calm sea, by altering the pitch and shape you can produce waves, the top of the wave corresponds with the maximum volume and pitch of the note, which like the wave itself rises and falls.

Free Music Designer Cassette Worth £9.95

Beethoven to Bowie - Starwars to Splats.

The screen display shows all functions. Simply move the cursor along the keyboard, select the desired note by pressing the fire button and the note selected then appears on the screen.

You can vary the tempo/volume and when 'played' the notes simultaneously scroll across the screen. 10 Envelope controls mean that once created, tunes and sounds can be subtly altered given varying attack and decay times to create futuristic music and sound effects. You can record and save up to three different tunes and amend each one as necessary. The dk'tronics Sound Synthesizer is suitable for both Spectrum and Spectrum + models and is guaranteed to give you hours of fun and would make an ideal Christmas gift, you never know you might turn to be another Stevie Wonder.

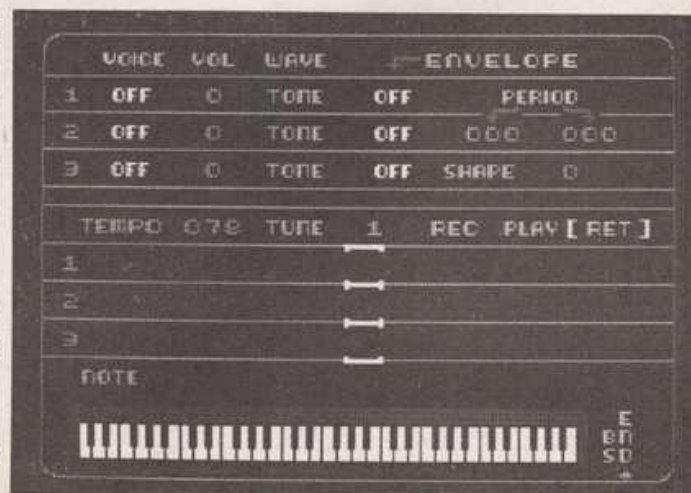
A THROUGH CONNECTOR ON THE REAR OF THE INTERFACE ALLOWS YOU TO PLUG IN OTHER PERIPHERALS LIKE THEIR CENTRONICS & JOYSTICK INTERFACES.

ALL FUTURE SOFTWARE RELEASES STARTING WITH 'POPEYE' WILL EXPLOIT THE FULL POTENTIAL OF THIS NEW PRODUCT.

At only £29.95 it comes complete with FREE music designer cassette worth £9.95 and represents remarkable value for money.

Available from department stores and good computer shops everywhere or direct from

dk'tronics, Saffron Walden, Essex CB11 3AQ. 12PCW
Tel. (0799) 26350. Add £1.25 post and packing.

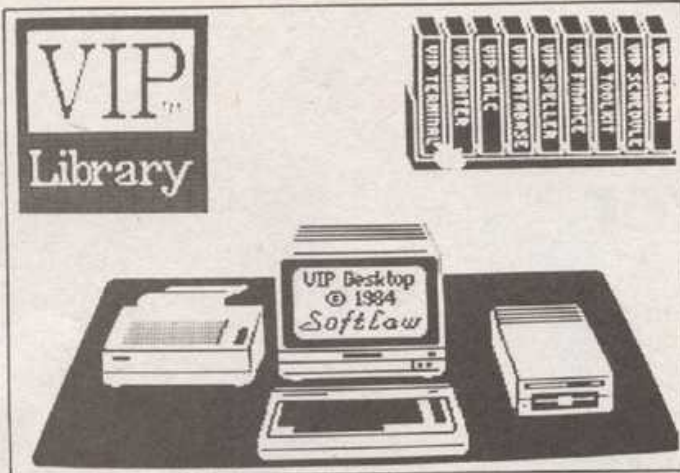


Advanced

System *VIP Terminal Micro*
Commodore 64 **Price** £50 on
disc **Supplier** Impex Designs,
Metro House, Second Way,
Wembley, Middlesex

Modems and the development of phone-in systems seem to be getting a good deal of attention these days. The speeding up of the British Telecom acceptance procedures for modems and the increasing interest of large companies such as Commodore and ICL in the commercial potential of phone-based communications are helping to generate interest. However, we are still somewhat behind the USA in this field and many of the new systems appearing in the UK now are based on American experience.

The VIP Terminal software, developed in Minneapolis, is a good example of the level of sophistication which can be achieved. The package gives nearly all the facilities required to fully exploit phone communications. Nine major functions allow you to set up a wide



range of options: a help facility, a screen display setup, a telephone directory, the communication mode itself, a facility to pre-program short messages on to certain keys, a real-time clock with alarm, disc management and file editing, and a printer-driver routine.

The display can be modified to show 40, 64, 80 or 106 columns of text, in any colour. Of course a monitor is suggested for the highest resolution. Automatic wordwrap can be switched on, and audible margin-warnings can be requested.

The terminal handles baud rates from 50 to 2400, including

split rate 1200/75, assuming that your modem is as versatile. The software gives you full control of such things as parity, stop-bits, duplex, linefeeds, pause characters, the sending of special characters, and so on. All those things which may change from system to system and can cause major problems for the inexperienced or non-technical user, such as myself. It is possible to call for help or modify these settings whilst in the communications mode.

The phone directory lets you keep phone numbers, settings for different systems (such as baud rate), and log-on messages. If you have a suitable

modem you can even get the software to auto-dial and log on for you. Unfortunately this is where the American software is of limited use. Commodore have released a number of modems in the States which are driven by this software, but many modems sold in the UK do not use the same method for auto-dialling.

The disc commands let you set up files on disc, modify files, send stored files through the modem, and receive and store files. Non-Commodore printers as well as the various types of Commodore printer are allowed for to produce a hard-copy of your communications.

The VIP Terminal is a very advanced package, giving facilities and a level of control usually reserved for business micros. The cost takes the software out of the games-software league, and deservedly so. A pity that the auto-dial may only be used by some, although most modems (thanks to BT) do not support this facility in any case. Incidentally the software cannot be used to drive the Compunet modem, nor can it be used to give full access to Compunet.

John Cochrane



Deuce

Program *Match Point* **Price** £7.95 **Micro** Commodore 64
Supplier Psion Limited, 22 Dorset Square, London NW1.

How about this for a last-minute contender for the Christmas No 1 slot? Psion — better known for its Sinclair titles — has produced its first ever program for the

Commodore 64, a conversion of its excellent Spectrum release *Match Point*, the tennis simulation to beat all tennis simulations.

So many Spectrum to Commodore conversions turn out to be disappointing — *Match Point* is a welcome exception. It all bodes well right from the speedy loading, followed by the title screen depicting a hunky specimen of the tennis fraternity.

As you might expect, the

graphics are bolder, even more life-like than the original, as the players skedaddle round the court on little legs at a great rate.

Choose from three speeds of play according to ability and how much you want to thrash the computer at its own game. The quarter final's speed is good for starting off with to enable you to work out how best to play the shots. Semi-final pace gives a good playable game, while the finals will soon have you reaching for the sweatband and umpire's refreshments yourself.

Almost as much fun as playing is watching two players battle it out in demo mode — no tantrums over dubious line calls here, and the Commodore crowd are a passive lot too — they don't turn their heads to follow the ball as they did on the Spectrum.

Three final points worth mentioning: the game is joystick controlled only, the blurb on the inlay says to abort a

match and return to the main menu press F1, whereas on my copy F2 did the trick, and if you press the space bar while serving, you can watch the receiver jiggle about on the baseline. Just like real life.

Christina Erskine

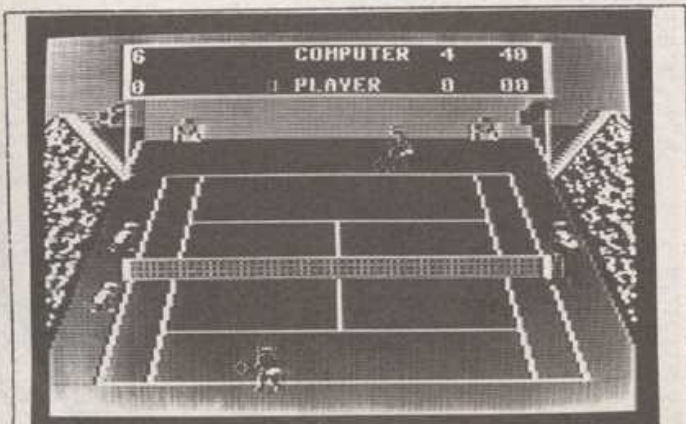


time to complete each task.

Given this element of competition it seems unfair not to display either score or time counting down. I think most children will feel cheated to suddenly find that the mirror 'shatters' because time has expired. And the use of the cursor keys is bad for little hands — why not user-definable ones?

Given these rather major reservations, the game should serve its purpose providing there is suitable parental supervision, something the booklet emphasises.

John Minson



tír na nòg



GARGOYLE GAMES

£9.95

48K ZX SPECTRUM

Tír Na Nòg – the land of youth, the other world.

Tír Na Nòg – the kingdom of the sidhe, the home of dagda's cauldron.

Tír Na Nòg – a vast and complex adventure, in a magical celtic landscape.

Tír Na Nòg – a most stunning visual experience, with state-of-the-art film animation.

Tír Na Nòg – a true computer movie.

ALSO FROM GARGOYLE:
THE STUNNING SPACE GAME,
AD ASTRA - £5.95

Welding by West Ham

Christina Erskine grapples with the giant robots at Ford's Dagenham car assembly plant

In a recent Keith lecture, Professor John Searle of the University of California criticised the development of domestic robots: "We are frequently assured that we are on the verge of having household robots that will do all the housework, amuse us with lively conversation and take care of us in our old age. That of course is so much nonsense."

It certainly is. "The home robot industry has so far been a bit of a flop — and Androbot's 'Topo' device, for example, was greeted with disappointing sales, both here and in the US.

But industrial robots have been around for a long time, and have reached a startling degree of sophistication.

At Ford's massive Dagenham plant, for instance, where up to 1000 Sierra and Fiesta cars are produced each day, 127 robots are used in body construction of the vehicles alone.

I met Dave Hutchinson, Dagenham's manufacturing engineering manager, for a tour of the body construction complex, and a close-up view of the robots themselves. The assembly plant is so vast — some 2½ million square feet — that walking round it is out of the question. We travelled by electric car.

"Ford uses four different makes of robot," Dave explained. "There are 42 Kuka models, and the same number of Nimaks, which are German manufactured, 12 Swedish Asa robots, and 24 Cincinnati, US. And that's just in body construction."

The word 'robot' conjures up images of the all-walking, all-talking machines Prof. Searle decried and the staff at Ford prefer for some reason best known to themselves to call their robots UTDs, or Universal Transfer Devices.

The first computer controlled UTDs were introduced in 1981, for the launch of the Sierra, successor to the immensely popular Cortina range of cars. The entire body construction of the Sierras is fully automated, untouched by human hand.

Fiesta models are also finished off by UTD, but much of the spot-welding is still done with a portable welding gun wielded by hand.

The Sierra robots act as a direct replacement to the workers who were previously mounted, but some hang from ganties on the assembly lines. Most are floor-mounted, but some hang from ganties about five feet above ground level.

Most are constructed as giant arms, set at their 'shoulders' into the floor or gantry. Their hands take the form of concentrated nozzles to fire the welds. Each robot has its own independent IPC processor, controlling its precise movements. Although they were all bought 'off-the-peg' by Ford, some, notably on the side-frame assembly line, are reprogrammable on-site.

The Sierra first begins to take shape on the 100 yard-long side-frame assembly line. The side panels themselves are made by Fiat subsidiary Comau, and are loaded on to the beginning of the line. Floor and gantry mounted Kukas and Nimaks spot weld the joints together as the frames pass through — window frames to the rear side panel and so on. After welding, the frames then have a sealer sprayed on by a smaller Asa robot.

"Before we had the Asa doing the sealing, the men on this job were always getting sealer over themselves. The Asa doesn't miss and gets the quantities right each time," said Dave. "Our own technical engineers also fitted an electronic sensor in the form of a small grey wire attached to the end of the Asa's arm — this checks for any assembly faults in the operation."

assembly faults in the operation."

assembly faults in the operation."

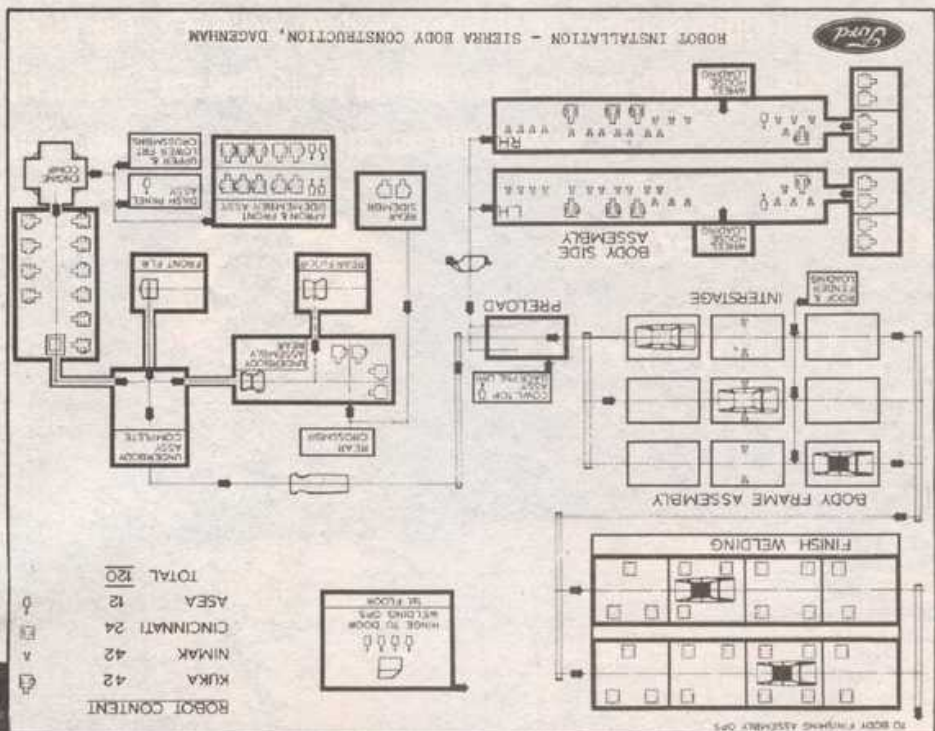
assembly faults in the operation."

assembly faults in the operation."

assembly faults in the operation."

assembly faults in the operation."

assembly faults in the operation."

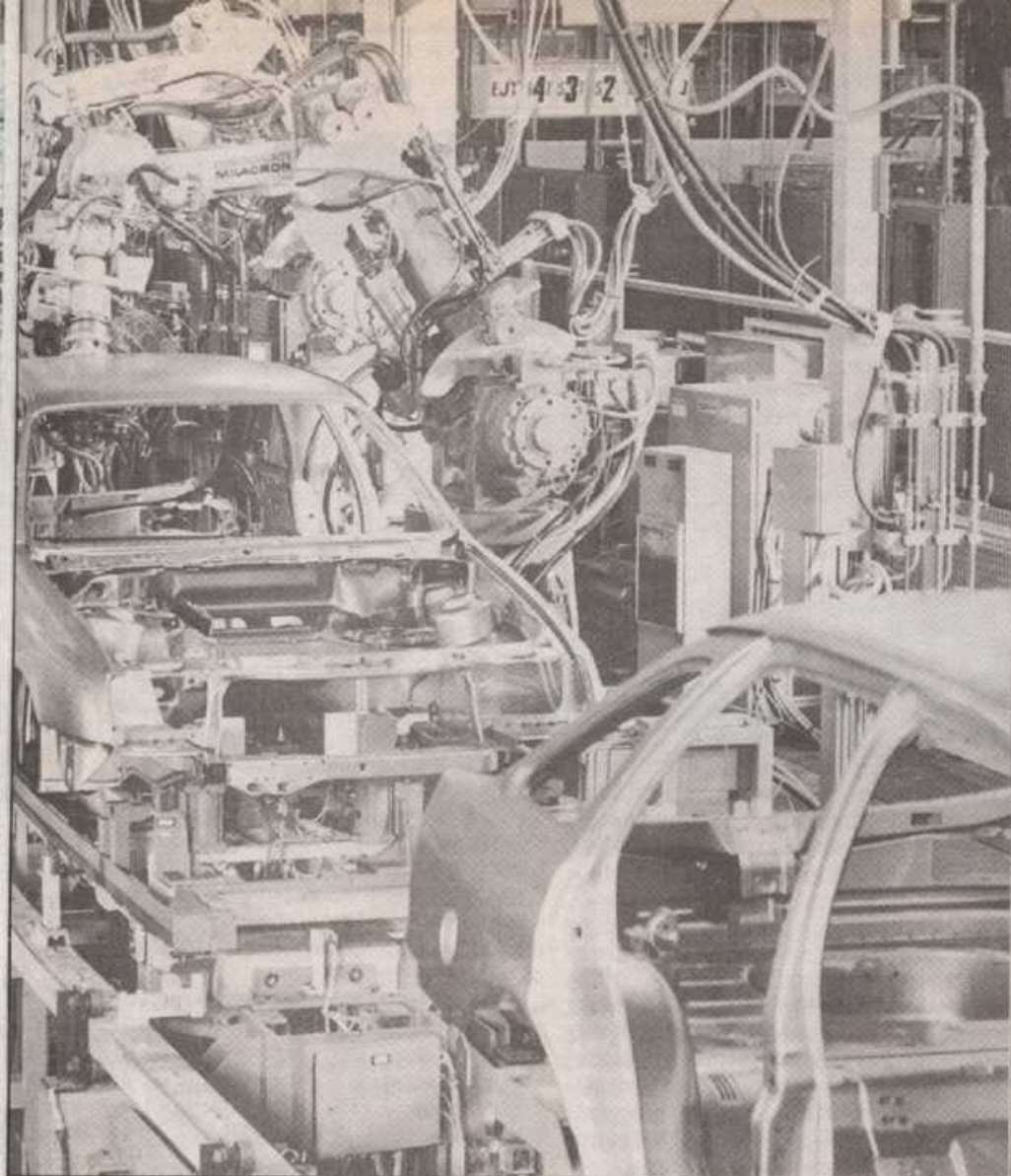


The side assembly actually comprises two "conveyor belts" operating simultaneously — one for the left-hand side, one for the right.

The finished frames are picked off the assembly line by a Niko 'arm and hand' device, and transferred on the next gantry to the right.

The assembly of the Sierra underbody is carried out independently from the side assembly — the two parts being brought together when the main





"Some were named after daughters of the floor workers."

The final operation to take place in the body construction area is quality control. Before leaving in an elevator for the first floor to have the doors and boot lids fitted, the underbody is placed on a large pressure sensitive 'bed'. Electronic sensors connected to a Hewlett-Packard computer check the position of each specific component. The charts produced from the computer immediately show if anything has been finished incorrectly — even a millimetre out of alignment can be detected.



Dave Hutchinson

The robots do not stop here with the assembly of the main body — the paint shop is also now fully automated too.

First the entire body frames are cleaned, degreased, electro-coated — to prevent corrosion — sealed at the joints, and cleaned again, to remove any lingering dirt or dust. Surprisingly, here the final cleaning is done using ostrich feathers. Robot ostriches? Apparently not.

Ostrich feathers are expensive, but last about a year before they need replacing. Their electrostatic properties make them the best for the job — far better than the plastic strips used in an automatic car wash.

The robots are allowed the last word though — they apply each of the seven coats of paint applied to the Sierra models.

The Sierra assembly line in the Dagenham plant is the most technologically advanced in the country. The cost of all the robots now installed on the line amounts to some £250m.

"We went by the robot route to save on constant labour costs and become more efficient," said Dave. "Obviously though we still need the staff to supervise and maintain the robots."

The question of how the robots have taken over from manpower is inevitably a touchy one. In the 1970s — pre-robot days — there were about 50 people working on side-frame assembly alone. Today that number has been whittled down to a fifth. And robots don't have salaries and paid holidays.

Ford maintains that such automation has had to be introduced in order for the company to remain competitive.

frame is constructed.

With the underbody, Kuka robots are again used for spot welding. "These are what we call hard automation robots, because they can't be reprogrammed," said Dave.

"The Kukas you saw on the side assembly are all reprogrammable — you can alter the speed at which they work, the number of spot welds they make, and so on. A separate hand-controlled unit can be plugged in, and the new motions gone through, physically, using the unit. Then you press a button, and the movements are stored in the robot's memory. The new programs are generally stored on tape and two back-up copies made.

"However, the underbody construction is all done with hard automation — the main panel is loaded in at the start, the rear and front floors and engine compartment are then spot welded on to complete the assembly. An electronic signal is also sent to the underbody assembly section to determine whether the components are to be set up for a left-hand or right-hand drive car.

"Automatic transfer devices, similar to the Niko 'hand' pick up the completed underbody — the part we call the 'marriage' — and bring it together with the side frames for the main body-frame assembly.

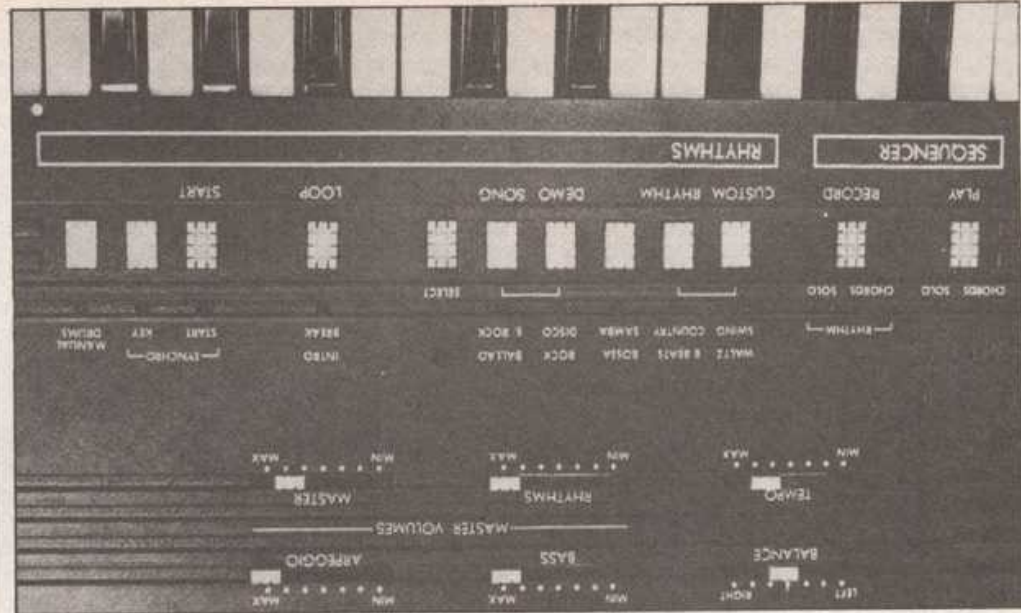
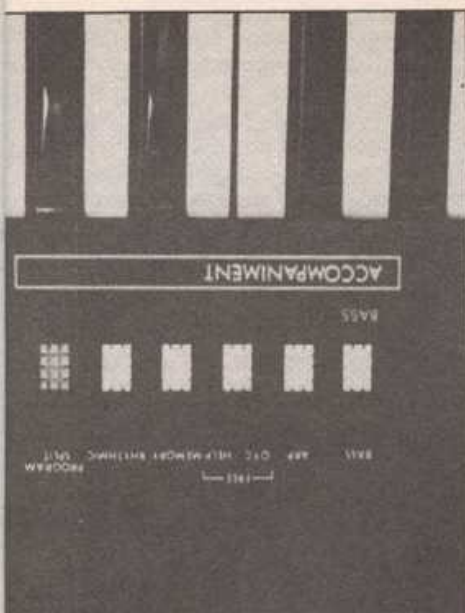
"The main body-frame assembly is still done by hand," admitted Dave. "We simply haven't found a better way yet. The staff on this line use simple clips to attach the roof panels, each side panel and the underbodies together."

Next the assembled Sierra bodies begin their trip down the long line of bulky Cincinnati robots to finally weld the frames together.

The 24 Cincinnati robots which finish off the welding are the most powerful. Standing about six feet high their precise movement is controlled by computer-operated hydraulic pistons and activators — rather than by electric motors. Whereas the spot-welding and clipping, up till now, has only involved the minimum number of connectors and robot movements to hold the frames together at this section of the line, the Cincinnati giants provide the main strength welding finish.

They were among the first robots to be used by Ford and are the only ones at Dagenham to have been given names — two are called Sarah and Anne and those on the second line are called after football teams — West Ham, Arsenal and Fulham.

Intrigued, I had to ask. "It was one way of making the robots seem less threatening when they were installed," Dave explained.



I looked particularly at SIEL's two packages for the Commodore — the *Midi Multitrack Composer* and the *Live Sequencer*. The *Composer* is some way towards musical notation which is clearly intended for computer novices rather than experienced musicians. In other words you don't get staves, crochets and quavers. Instead,

due as is some BBC software. A BBC MIDI interface is for the Spectrum. A BBC MIDI interface is at present there are computer software — at present there are interface unit (£99) and controlled by be linked to a home computer via SIEL's MIDI. But the MK900 has MIDI and as such can sounds and rhythms.

most having much more impressive same features, a few of the limitations, but Casio keyboards, incorporating many of the in all, it is the elder brother to all those little sily to provide a simple backing for solos. All the sequencer and will loop round endlessly. Any of the features may be recorded into — very effective and useful.

units. There is also the facility to create your own rhythms guided by a metronome pulse clicks usually associated with built-in drum sounds lift it way above the thin thuds and of the rhythm section is good. Digital detune features.

the case, can be improved by sustain and Even the larnest, the Piano preset, as is often some of the basic sounds pretty impressive. A feature which enables two presets to be played at once on the same note makes autoaccompaniment features.

What you get for £449 is a five octave full size keyboard with ten preset sounds, ten rhythms, a sequencer which can remember 50 chords and 280 notes and various zoom through the former and look at the latter in more detail.

There are two ways of looking at the SIEL MK900, as an instrument in its own right and as a computer controlled MIDI keyboard. This being a computer magazine, we'll zoom through the former and look at the latter in more detail.

For musicians linking a computer to a keyboard allows a freedom similar to that provided by wordprocessors to writers and typists previously accustomed to typewriters. Software packages can (and, in at least one case, do) allow for multi-part composition with instant playback of one or all parts. Sections of music can be rearranged, moved about, assigned to different instru-

For musicians linking a computer to a keyboard allows a freedom similar to that provided by wordprocessors to writers and typists previously accustomed to typewriters. Software packages can (and, in at least one case, do) allow for multi-part composition with instant playback of one or all parts. Sections of music can be rearranged, moved about, assigned to different instru-

control with a computer in absolute terms. For educational purposes you get more through that response varies the end result, because it requires your response and absolutely horrendously written, which has flashing leads or instant chords (unless it is music will always be more successful than Using computer programs to learn about the flexibility that was originally lacking. shopping. What a computer can provide is dities you hear in hypermarkets whilst sounded like the kind of skull-numbing of the system meant that the end results by unsuccessful, but the inherent inflexibility All this easy-play technology wasn't total-

ger melodies.

plastic, accompaniment to your single features, like one-note chords and auto lights and thereby learn the tune. Other idea being that you would try to follow the tune stored in its memory was played — the instruments had little lights — that help people learn music; some of their Casio tried many different techniques to able to crank out a few tunes at parties. dabbler, amateurs who know a little music professional musicians but rather from know that the real money is not made from

as easy to play as possible. Casio and co. musical keyboards have spent much time, look at the other side of the coin.

Why not just buy the instrument? Time to argument, why involve the computer at all? But whilst all this is a pro-synthesiser simple chords.

means, basically, that you cannot even play best, four channels of sound. This last point computers are capable of only three or, at difference. Sound chips on available instruments that it's often difficult to tell the capable of such perfect mimicry of acoustic The synthesiser on the market now are board with any finesse — but also in terms never otherwise possess. Not only ergono-

A synthesiser can give the current crop of common a peripheral as a joystick or light the way to the time when a synthesiser is as more than a good printer. It's a big step on keyboard for just over £400 — not much However, the new SIEL MK900 is a MIDI equipped keyboard has been £700 at least. music. Until recently the cheapest MIDI too expensive, whatever their interest in so far the jump into MIDI has simply been The problem for computer owners is, that computer music development.

different manufacturers, looks like being them to connect together instruments from standard for musicians, enabling What has been said of MIDI recently.

Hardware SIEL MK900 Price £499 (MIDI interface £99, Software £30 approx) Supplier SIEL UK, Alhed Depot, Reigate Road, Hookwood, Horley, Surrey.

Performing SIEL

Hardware Review



notes are notated with their letter and a number to indicate which octave you require, eg, C4 equals C in the fourth octave. The # and the b sign are used to indicate sharp and flat respectively. Note length is expressed as fractions of 96, so a quarter note has a duration of 96/4, ie, 24.

Tunes are created on one of six tracks (like a single line of monophonic, ie, single note music) which are then assigned to Midi channels. More than one track may be assigned to each Midi channel and in this way chords may be created using combined single tracks together.

Individual notes may be made staccato or legato by adjusting the 'gate on time' figure — basically slightly adjusting this figure makes the note a little longer or shorter without affecting the 'clock'.

Each track of music may be edited — notes may be removed, added, note lengths changed and so on, tracks may be saved to disc, loaded in, renamed or erased under your command. What does this mean in terms of the MK900?

The keyboard has two Midi channels: 0 and 1. This means that it can have two 'streams of information' operating independently at the same time. If that sounds confusing it isn't, since in practice two Midi channels means that at any given moment two sounds may be used and within each sound the six tracks may be allotted. For example, by assigning tracks one to four to Midi 0 and tracks 5 and 6 to Midi 1 you have set up an arrangement whereby one sound (say, organ) can play chords, up to four notes and the other sound (say, synth) can play up to two notes on a lead line. I should add that whilst the computer is playing the keyboard you can still join in, using the same sounds.

On the Commodore you are provided with a total of 9000 notes to play around with, 1533 over the six channels, enough for anything short of *The Ring Cycle*. The C4,B3=, D5 notation is obviously pretty irksome to tap into the keyboard but if, like me, your musical compositions don't get much beyond three note chords and one

note lead lines it shouldn't be too much of a problem.

The live sequencer is, in a way, the Composer from the other end. Here you set up the program to receive information and play the keyboard. The border flashes as each note is 'received' by the computer, although all that is recorded is the note information, not the particular tone you have set — you can change that as you wish.

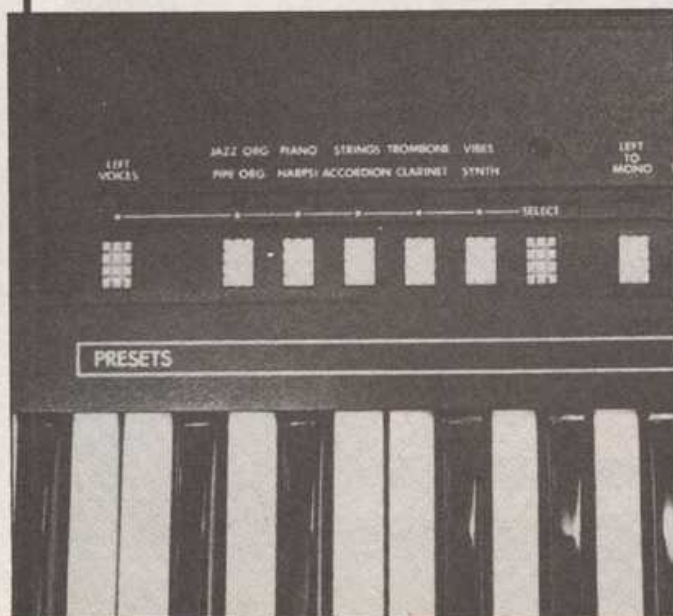
The recorded notes are assigned to a given track and may be played back through the keyboard at a faster or slower speed. New tracks may be recorded and also played back — the effect is very much like having a multi-channel tape recorder with extensive over-dub facilities.

Obviously entering the music with the keyboard is much more convenient than typing in the notes on the Commodore but then you don't get the same degree of editing flexibility. You pay your money... etc, etc. The MK900 is a high quality top-of-the-range portable with enough features and quality sounds to get music that doesn't sound bad with only a little effort. Add a Midi interface and you have, with the right software, an instrument on which you can compose multi-part music, create and replay many lines of melody and generally tinker to your heart's content.

The MK900 lacks two things; firstly it has presets and thus the sound creation is limited and secondly the Midi standard allows for the communication of velocity (how hard you hit the keyboard) but the MK900 is not a velocity sensitive keyboard. In this sense, buying the MK900 is not letting you use all the Midi features possible.

For my money the MK900 is the ideal instrument for those who want a starting point with computer music but aren't too worried about limited sounds and don't want to risk too much money. The auto features are particularly useful and with the software packages that will surely come, sophisticated and impressive arrangements can be created.

Graham Taylor



49 MOUNT PLEASANT, TADLEY, BASINGSTOKE, HANTS.

PLEASE SEND 50p P&P WITH EACH ORDER

LLAMASOFT

CHALLENGING, WITTY, ABSORBING



£7.50

£6.00



£5.50



ANOTHER GREAT ORIGINAL FROM LLAMASOFT



£7.50

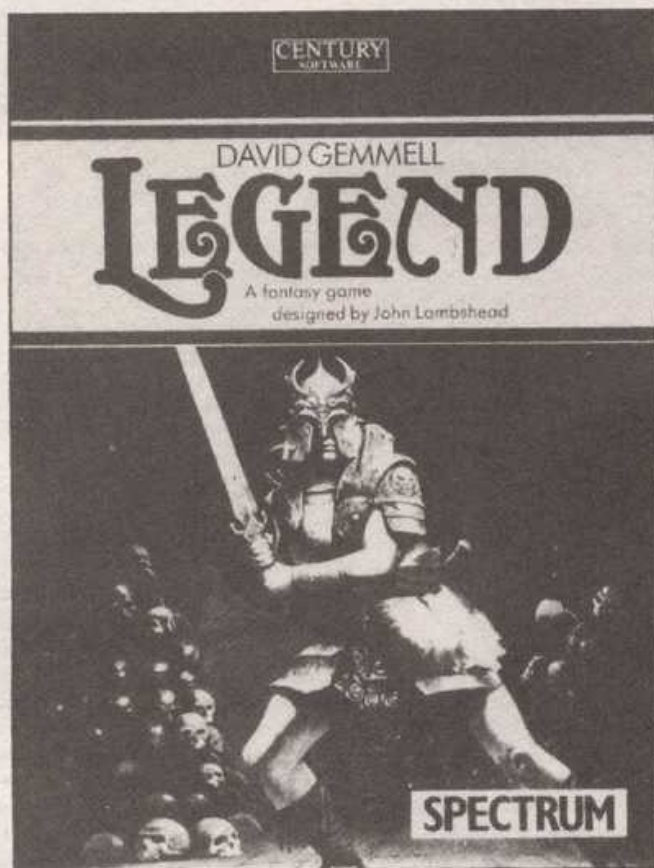


SEND SAE FOR
LARGE ANCIPITAL
MAP

CENTURY
COMMUNICATIONS

LEGEND

DAVID GEMMELL



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 0 7126 0602 5
Sinclair 48K Spectrum

ORDER FORM

To: Gill Small, Tiptree Book Services Ltd,
Church Road, Tiptree,
Colchester, Essex CO5 0SR

Please send me ... LEGEND software pack(s)
at £14.95 (inc VAT and post & packaging)

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

Please debit my *Visa/Access account number
*delete as appropriate

Account Number

Name

Address

Signed

Please allow 28 days for delivery, subject to availability

POPCW

Compatible

Hardware Saga 1 Emperor Micro Spectrum Price £54.95 Supplier Saga Systems Limited, Woodham Road, Woking, Surrey.

It has always annoyed me that so called 'professional' keyboards for the Spectrum have fallen short of anything that could really be used to obtain respectable typing speeds. Admittedly this is primarily the fault of the hopeless double shift and extended modes of the keyboard system. These present manufacturers with endless headaches if they want to provide a board that allows one keypress access to the various punctuation marks. As I understand it, Sinclair themselves had to resort to special arms within the Spectrum + that physically depress different parts of the membrane to obtain the extra keys such as the semi-colon. On first opening the box of the Saga 1, I dared to hope that someone else had finally come up with a mechanism for doing the same, as most of the punctuation marks are represented on their own as well as selected functions such as *Edit* and *Delete* that can only be accessed using the shift keys. Disappointingly the system they have used in fact only comes halfway to providing these features as they are no more than relabelled copies of the original key and return the unshifted signal when pressed alone.

The idea is that it is easier to spot and use the most common functions and Saga have provided no less than two cap shifts and four (count them) symbol shifts at useful points all over the board. After some practice you realise that this is a good compromise and makes the use of the keyboard faster and more pleasant. Keys also exist for the unshifted functions *Rm*, *Load*, *List*, *Save* and *Cls*. Here are also extra cursors in some extremely sensible positions on the board which unlike the Spectrum +, return the numbers 5-8 when unshifted so they will be fully compatible with all existing software.

Some aspects of the design are irritating. The colour coding on the keys is inconsistent, with symbol shifted functions being represented in various places in black, red and green. This is not made easier by the fact that the various keywords on the main Qwerty area are very hard to read, being much smaller than on the original Spectrum which uses the area above and below the keys to carry a lot of information.

Perhaps to allow all the various interfaces to be connected, the bottom of the Spectrum board is actually screwed on beneath the Saga, a system that works much better than I expected even though it does leave a gaping hole around the edge connector. However, this does mean that four rubber feet provided at the bottom of the new

Professional

Hardware Datafax Disc Interface Micro Sinclair Spectrum Price £86.25 Supplier Statcom Distribution Ltd, 18 Grove Road, Sutton, Surrey

Some months back it seemed as if a whole bunch of disc interfaces were about to be launched for the Sinclair Spectrum. Very few of them actually saw the light of day, partly because of micro-drives and partly because the Spectrum was not designed around a disc operating system.



The Datafax interface, consisting of a strongly-built and quite long black box, is the latest attempt to get around this problem. Designed initially to run with a single

with a nice big space bar and two large feel and the layout is on the whole very good. The keys themselves have a very positive feel and an absolute joy to use.

However, these are only minor criticisms and they shouldn't put you off. On the contrary, this is not only the most elegantly designed and styled add-on board for the Spectrum yet, but it is also firmly constructed and an absolute joy to use.

Assembly of the new board is as simple as the blurb claims, involving only the removal of five screws and the two ribbon connectors of the Spectrum board and replacing them with about eight new screws, the new ribbons and a small clip on the interface. However, the whole system is let down by very poor documentation, which only makes sense once you have figured out for yourself how the thing must go together. It is also complicated by the inclusion of a few extra mystery screws and clips which I assume are for the other Saga peripherals, such as a sound amplifier that fits inside the case.

board never actually touch the ground. I also found the key layout a bit unbalanced with almost all the new keys punched on the left hand side. This is something you soon get used to.

Tony Kendle

Enter keys. I think it knocks spots off the competition.



3-inch Hitachi-based drive (available from the same distributors for around £200, although ask them about an all-in-one price) the interface can be used with 3.5, and 5.25 inch drives. A very simple operating system has been developed which allows you to load and save programs, data-arrays, and machine code. The only other facilities provided are to format new discs, to list a disc directory, to erase a saved file, and to make a backup copy of a whole disc. By keeping the system this simple, the Datafax designers have managed to produce a very useable device which offers high-speed and high-reliability loading and saving without the need to learn a complex new way of using your computer. The interface offers a total capacity of just over 100k per disc side, although work is in hand to operate two drives and to increase the storage per drive. This 100k can be divided between up to 39 separate files.

But what about compatibility with existing hardware and software? In principle all hardware is compatible although this is achieved by the simple expedient of providing a hardware switch to control the expansion port provided. Thus you can switch between, say, joysticks and disc, but you cannot have them both on at once. Most software can also be used, including programs which use nearly all the normal Spectrum memory. This is because the interface permits its own software (which normally uses some of the free Ram) to be overwritten. A special loading procedure allows you to pack in the largest of programs, although you lose the screen display in the process.

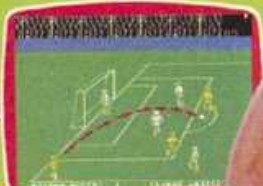
John Cochran

MATCH DAY



Match Day is no ordinary soccer game. Blistering 3-D action, total animation and automatic camera scan are just some of the intricate techniques which make Match Day the league leader of soccer games. Now follow the "Action":

Your striker traps the ball from a perfectly placed corner-kick, takes on the defender and dribbles neatly round him making space to



chip in a teasing cross-ball to his advancing team mate in the



six-yard box. There is no time to control the ball, your player must commit himself to a snap shot on goal...



his powerful half-volley rattles the cross-bar, the ball returns, floating menacingly above the penalty



area and your star striker seizes this half-chance



to head the ball decisively into the back of the net... GOAL!



Match Day is as compelling as soccer itself. You will marvel at the depth of play and ball control offered only in MATCH DAY... Shoot to win!

SPECTRUM 48k

7.95

ocean

SPECTRUM 48k

7.95

Ocean House · 6 Central Street · Manchester · M2 5NS · Telephone 061 832 6633 · Telex 669977

Ocean Software is available from selected branches of: **WOOLWORTH**, **WHSMITH**, **John Menzies**, **LASKYS**, **Rumbelows**, **COMET**, Spectrum Shops and all good software dealers. Trade enquiries welcome.

Moving into reverse

An equation converter written for any Spectrum by Richard Armstrong

One of the biggest difficulties in using a language like Fortran or Assembly language is that expressions like

$A \cdot B + C = D$ have to be written as $AB \cdot C + D =$. This is known as Reverse Polish Notation. Converting to Reverse

Polish (or as it is sometimes known, Postfix) Notation can be difficult, especially if dealing with large expressions. Fortunately, an algorithm produced by a famous computer scientist called Edsger Dijkstra can do the conversion for us. This program is based on that algorithm.

The program is simple to use. Firstly the user is prompted to input the expression he wishes to be translated. The computer then prints out the corresponding Postfix expression. The program can handle the following operators: +, -, *, /, =, (,), Or, And. Operands are represented by the capital letters A to Z.

As an example, the expression $A = B \text{ And } C + D = E$ would be translated to $AB = CD + E = \text{And}$. Note that And and Or should be entered direct from the keyboard, and not spelled out one letter at a time. When the prompt 'More? (Y/N)' appears, the user should press Y to translate more expressions or N to end the program.

The program works by considering each element of AB in turn. If the element under consideration is an operand (A...Z) then it is printed. If the element is an operator (=, +, etc) then its priority must be considered. If the element is an operator printed. If the element is an operator (=, +, etc) then its priority must be considered. If the element is an operator printed. If the element is an operator (=, +, etc) then its priority must be considered.

If the element of AB is an operator, then operators are removed from the stack and there is a left hand bracket on top of the stack, or (finally) the operator on the top of the stack has a lower priority than the element of AB under consideration. The element being considered is then added to the stack. If the element being considered is a left hand bracket, then this is likewise added to the stack. If, however, the element of AB is a right hand bracket, then the operators are removed from the stack and printed until a left hand bracket is found.

Program Notes

Line No	Print instructions and read expression
10-90	
130-180	Loop to scan the input expression and to be translated
190-210	Call appropriate sub-routines
220-270	Decide if more expressions are to be converted
310-360	Print items from the stack until a left hand bracket is found
400-420	Drop an operator from the stack

```

10 REM INFIX TO R.P.N.
20 LET S$=""
30 LET SP=0
33 PRINT " " INFIX TO POSTFIX
35 PRINT " "
36 PRINT " "
37 PRINT " "
38 PRINT " "
39 PRINT " "
40 PRINT " "
41 PRINT " "
42 PRINT " "
43 PRINT " "
44 PRINT " "
45 PRINT " "
46 PRINT " "
47 PRINT " "
48 PRINT " "
49 PRINT " "
50 INPUT A$
51 INPUT A$
52 INPUT A$
53 INPUT A$
54 INPUT A$
55 INPUT A$
56 INPUT A$
57 INPUT A$
58 INPUT A$
59 INPUT A$
60 PRINT " "
61 PRINT " "
62 PRINT " "
63 PRINT " "
64 PRINT " "
65 PRINT " "
66 PRINT " "
67 PRINT " "
68 PRINT " "
69 PRINT " "
70 PRINT " "
71 PRINT " "
72 PRINT " "
73 PRINT " "
74 PRINT " "
75 PRINT " "
76 PRINT " "
77 PRINT " "
78 PRINT " "
79 PRINT " "
80 PRINT " "
81 PRINT " "
82 PRINT " "
83 PRINT " "
84 PRINT " "
85 PRINT " "
86 PRINT " "
87 PRINT " "
88 PRINT " "
89 PRINT " "
90 PRINT " "
91 PRINT " "
92 PRINT " "
93 PRINT " "
94 PRINT " "
95 PRINT " "
96 PRINT " "
97 PRINT " "
98 PRINT " "
99 PRINT " "
100 PRINT " "
101 PRINT " "
102 PRINT " "
103 PRINT " "
104 PRINT " "
105 PRINT " "
106 PRINT " "
107 PRINT " "
108 PRINT " "
109 PRINT " "
110 PRINT " "
111 PRINT " "
112 PRINT " "
113 PRINT " "
114 PRINT " "
115 PRINT " "
116 PRINT " "
117 PRINT " "
118 PRINT " "
119 PRINT " "
120 PRINT " "
121 PRINT " "
122 PRINT " "
123 PRINT " "
124 PRINT " "
125 PRINT " "
126 PRINT " "
127 PRINT " "
128 PRINT " "
129 PRINT " "
130 PRINT " "
131 PRINT " "
132 PRINT " "
133 PRINT " "
134 PRINT " "
135 PRINT " "
136 PRINT " "
137 PRINT " "
138 PRINT " "
139 PRINT " "
140 PRINT " "
141 PRINT " "
142 PRINT " "
143 PRINT " "
144 PRINT " "
145 PRINT " "
146 PRINT " "
147 PRINT " "
148 PRINT " "
149 PRINT " "
150 PRINT " "
151 PRINT " "
152 PRINT " "
153 PRINT " "
154 PRINT " "
155 PRINT " "
156 PRINT " "
157 PRINT " "
158 PRINT " "
159 PRINT " "
160 PRINT " "
161 PRINT " "
162 PRINT " "
163 PRINT " "
164 PRINT " "
165 PRINT " "
166 PRINT " "
167 PRINT " "
168 PRINT " "
169 PRINT " "
170 PRINT " "
171 PRINT " "
172 PRINT " "
173 PRINT " "
174 PRINT " "
175 PRINT " "
176 PRINT " "
177 PRINT " "
178 PRINT " "
179 PRINT " "
180 PRINT " "
181 PRINT " "
182 PRINT " "
183 PRINT " "
184 PRINT " "
185 PRINT " "
186 PRINT " "
187 PRINT " "
188 PRINT " "
189 PRINT " "
190 PRINT " "
191 PRINT " "
192 PRINT " "
193 PRINT " "
194 PRINT " "
195 PRINT " "
196 PRINT " "
197 PRINT " "
198 PRINT " "
199 PRINT " "
200 PRINT " "
201 PRINT " "
202 PRINT " "
203 PRINT " "
204 PRINT " "
205 PRINT " "
206 PRINT " "
207 PRINT " "
208 PRINT " "
209 PRINT " "
210 PRINT " "
211 PRINT " "
212 PRINT " "
213 PRINT " "
214 PRINT " "
215 PRINT " "
216 PRINT " "
217 PRINT " "
218 PRINT " "
219 PRINT " "
220 PRINT " "
221 PRINT " "
222 PRINT " "
223 PRINT " "
224 PRINT " "
225 PRINT " "
226 PRINT " "
227 PRINT " "
228 PRINT " "
229 PRINT " "
230 PRINT " "
231 PRINT " "
232 PRINT " "
233 PRINT " "
234 PRINT " "
235 PRINT " "
236 PRINT " "
237 PRINT " "
238 PRINT " "
239 PRINT " "
240 PRINT " "
241 PRINT " "
242 PRINT " "
243 PRINT " "
244 PRINT " "
245 PRINT " "
246 PRINT " "
247 PRINT " "
248 PRINT " "
249 PRINT " "
250 PRINT " "
251 PRINT " "
252 PRINT " "
253 PRINT " "
254 PRINT " "
255 PRINT " "
256 PRINT " "
257 PRINT " "
258 PRINT " "
259 PRINT " "
260 PRINT " "
261 PRINT " "
262 PRINT " "
263 PRINT " "
264 PRINT " "
265 PRINT " "
266 PRINT " "
267 PRINT " "
268 PRINT " "
269 PRINT " "
270 PRINT " "
271 PRINT " "
272 PRINT " "
273 PRINT " "
274 PRINT " "
275 PRINT " "
276 PRINT " "
277 PRINT " "
278 PRINT " "
279 PRINT " "
280 PRINT " "
281 PRINT " "
282 PRINT " "
283 PRINT " "
284 PRINT " "
285 PRINT " "
286 PRINT " "
287 PRINT " "
288 PRINT " "
289 PRINT " "
290 PRINT " "
291 PRINT " "
292 PRINT " "
293 PRINT " "
294 PRINT " "
295 PRINT " "
296 PRINT " "
297 PRINT " "
298 PRINT " "
299 PRINT " "
300 PRINT " "
301 PRINT " "
302 PRINT " "
303 PRINT " "
304 PRINT " "
305 PRINT " "
306 PRINT " "
307 PRINT " "
308 PRINT " "
309 PRINT " "
310 PRINT " "
311 PRINT " "
312 PRINT " "
313 PRINT " "
314 PRINT " "
315 PRINT " "
316 PRINT " "
317 PRINT " "
318 PRINT " "
319 PRINT " "
320 PRINT " "
321 PRINT " "
322 PRINT " "
323 PRINT " "
324 PRINT " "
325 PRINT " "
326 PRINT " "
327 PRINT " "
328 PRINT " "
329 PRINT " "
330 PRINT " "
331 PRINT " "
332 PRINT " "
333 PRINT " "
334 PRINT " "
335 PRINT " "
336 PRINT " "
337 PRINT " "
338 PRINT " "
339 PRINT " "
340 PRINT " "
341 PRINT " "
342 PRINT " "
343 PRINT " "
344 PRINT " "
345 PRINT " "
346 PRINT " "
347 PRINT " "
348 PRINT " "
349 PRINT " "
350 PRINT " "
351 PRINT " "
352 PRINT " "
353 PRINT " "
354 PRINT " "
355 PRINT " "
356 PRINT " "
357 PRINT " "
358 PRINT " "
359 PRINT " "
360 PRINT " "
361 PRINT " "
362 PRINT " "
363 PRINT " "
364 PRINT " "
365 PRINT " "
366 PRINT " "
367 PRINT " "
368 PRINT " "
369 PRINT " "
370 PRINT " "
371 PRINT " "
372 PRINT " "
373 PRINT " "
374 PRINT " "
375 PRINT " "
376 PRINT " "
377 PRINT " "
378 PRINT " "
379 PRINT " "
380 PRINT " "
381 PRINT " "
382 PRINT " "
383 PRINT " "
384 PRINT " "
385 PRINT " "
386 PRINT " "
387 PRINT " "
388 PRINT " "
389 PRINT " "
390 PRINT " "
391 PRINT " "
392 PRINT " "
393 PRINT " "
394 PRINT " "
395 PRINT " "
396 PRINT " "
397 PRINT " "
398 PRINT " "
399 PRINT " "
400 PRINT " "
401 PRINT " "
402 PRINT " "
403 PRINT " "
404 PRINT " "
405 PRINT " "
406 PRINT " "
407 PRINT " "
408 PRINT " "
409 PRINT " "
410 PRINT " "
411 PRINT " "
412 PRINT " "
413 PRINT " "
414 PRINT " "
415 PRINT " "
416 PRINT " "
417 PRINT " "
418 PRINT " "
419 PRINT " "
420 PRINT " "
421 PRINT " "
422 PRINT " "
423 PRINT " "
424 PRINT " "
425 PRINT " "
426 PRINT " "
427 PRINT " "
428 PRINT " "
429 PRINT " "
430 PRINT " "
431 PRINT " "
432 PRINT " "
433 PRINT " "
434 PRINT " "
435 PRINT " "
436 PRINT " "
437 PRINT " "
438 PRINT " "
439 PRINT " "
440 PRINT " "
441 PRINT " "
442 PRINT " "
443 PRINT " "
444 PRINT " "
445 PRINT " "
446 PRINT " "
447 PRINT " "
448 PRINT " "
449 PRINT " "
450 PRINT " "
451 PRINT " "
452 PRINT " "
453 PRINT " "
454 PRINT " "
455 PRINT " "
456 PRINT " "
457 PRINT " "
458 PRINT " "
459 PRINT " "
460 PRINT " "
461 PRINT " "
462 PRINT " "
463 PRINT " "
464 PRINT " "
465 PRINT " "
466 PRINT " "
467 PRINT " "
468 PRINT " "
469 PRINT " "
470 PRINT " "
471 PRINT " "
472 PRINT " "
473 PRINT " "
474 PRINT " "
475 PRINT " "
476 PRINT " "
477 PRINT " "
478 PRINT " "
479 PRINT " "
480 PRINT " "
481 PRINT " "
482 PRINT " "
483 PRINT " "
484 PRINT " "
485 PRINT " "
486 PRINT " "
487 PRINT " "
488 PRINT " "
489 PRINT " "
490 PRINT " "
491 PRINT " "
492 PRINT " "
493 PRINT " "
494 PRINT " "
495 PRINT " "
496 PRINT " "
497 PRINT " "
498 PRINT " "
499 PRINT " "
500 PRINT " "
501 PRINT " "
502 PRINT " "
503 PRINT " "
504 PRINT " "
505 PRINT " "
506 PRINT " "
507 PRINT " "
508 PRINT " "
509 PRINT " "
510 PRINT " "
511 PRINT " "
512 PRINT " "
513 PRINT " "
514 PRINT " "
515 PRINT " "
516 PRINT " "
517 PRINT " "
518 PRINT " "
519 PRINT " "
520 PRINT " "
521 PRINT " "
522 PRINT " "
523 PRINT " "
524 PRINT " "
525 PRINT " "
526 PRINT " "
527 PRINT " "
528 PRINT " "
529 PRINT " "
530 PRINT " "
531 PRINT " "
532 PRINT " "
533 PRINT " "
534 PRINT " "
535 PRINT " "
536 PRINT " "
537 PRINT " "
538 PRINT " "
539 PRINT " "
540 PRINT " "
541 PRINT " "
542 PRINT " "
543 PRINT " "
544 PRINT " "
545 PRINT " "
546 PRINT " "
547 PRINT " "
548 PRINT " "
549 PRINT " "
550 PRINT " "
551 PRINT " "
552 PRINT " "
553 PRINT " "
554 PRINT " "
555 PRINT " "
556 PRINT " "
557 PRINT " "
558 PRINT " "
559 PRINT " "
560 PRINT " "
561 PRINT " "
562 PRINT " "
563 PRINT " "
564 PRINT " "
565 PRINT " "
566 PRINT " "
567 PRINT " "
568 PRINT " "
569 PRINT " "
570 PRINT " "
571 PRINT " "
572 PRINT " "
573 PRINT " "
574 PRINT " "
575 PRINT " "
576 PRINT " "
577 PRINT " "
578 PRINT " "
579 PRINT " "
580 PRINT " "
581 PRINT " "
582 PRINT " "
583 PRINT " "
584 PRINT " "
585 PRINT " "
586 PRINT " "
587 PRINT " "
588 PRINT " "
589 PRINT " "
590 PRINT " "
591 PRINT " "
592 PRINT " "
593 PRINT " "
594 PRINT " "
595 PRINT " "
596 PRINT " "
597 PRINT " "
598 PRINT " "
599 PRINT " "
600 PRINT " "
601 PRINT " "
602 PRINT " "
603 PRINT " "
604 PRINT " "
605 PRINT " "
606 PRINT " "
607 PRINT " "
608 PRINT " "
609 PRINT " "
610 PRINT " "
611 PRINT " "
612 PRINT " "
613 PRINT " "
614 PRINT " "
615 PRINT " "
616 PRINT " "
617 PRINT " "
618 PRINT " "
619 PRINT " "
620 PRINT " "
621 PRINT " "
622 PRINT " "
623 PRINT " "
624 PRINT " "
625 PRINT " "
626 PRINT " "
627 PRINT " "
628 PRINT " "
629 PRINT " "
630 PRINT " "
631 PRINT " "
632 PRINT " "
633 PRINT " "
634 PRINT " "
635 PRINT " "
636 PRINT " "
637 PRINT " "
638 PRINT " "
639 PRINT " "
640 PRINT " "
641 PRINT " "
642 PRINT " "
643 PRINT " "
644 PRINT " "
645 PRINT " "
646 PRINT " "
647 PRINT " "
648 PRINT " "
649 PRINT " "
650 PRINT " "
651 PRINT " "
652 PRINT " "
653 PRINT " "
654 PRINT " "
655 PRINT " "
656 PRINT " "
657 PRINT " "
658 PRINT " "
659 PRINT " "
660 PRINT " "
661 PRINT " "
662 PRINT " "
663 PRINT " "
664 PRINT " "
665 PRINT " "
666 PRINT " "
667 PRINT " "
668 PRINT " "
669 PRINT " "
670 PRINT " "
671 PRINT " "
672 PRINT " "
673 PRINT " "
674 PRINT " "
675 PRINT " "
676 PRINT " "
677 PRINT " "
678 PRINT " "
679 PRINT " "
680 PRINT " "
681 PRINT " "
682 PRINT " "
683 PRINT " "
684 PRINT " "
685 PRINT " "
686 PRINT " "
687 PRINT " "
688 PRINT " "
689 PRINT " "
690 PRINT " "
691 PRINT " "
692 PRINT " "
693 PRINT " "
694 PRINT " "
695 PRINT " "
696 PRINT " "
697 PRINT " "
698 PRINT " "
699 PRINT " "
700 PRINT " "
701 PRINT " "
702 PRINT " "
703 PRINT " "
704 PRINT " "
705 PRINT " "
706 PRINT " "
707 PRINT " "
708 PRINT " "
709 PRINT " "
710 PRINT " "
711 PRINT " "
712 PRINT " "
713 PRINT " "
714 PRINT " "
715 PRINT " "
716 PRINT " "
717 PRINT " "
718 PRINT " "
719 PRINT " "
720 PRINT " "
721 PRINT " "
722 PRINT " "
723 PRINT " "
724 PRINT " "
725 PRINT " "
726 PRINT " "
727 PRINT " "
728 PRINT " "
729 PRINT " "
730 PRINT " "
731 PRINT " "
732 PRINT " "
733 PRINT " "
734 PRINT " "
735 PRINT " "
736 PRINT " "
737 PRINT " "
738 PRINT " "
739 PRINT " "
740 PRINT " "
741 PRINT " "
742 PRINT " "
743 PRINT " "
744 PRINT " "
745 PRINT " "
746 PRINT " "
747 PRINT " "
748 PRINT " "
749 PRINT " "
750 PRINT " "
751 PRINT " "
752 PRINT " "
753 PRINT " "
754 PRINT " "
755 PRINT " "
756 PRINT " "
757 PRINT " "
758 PRINT " "
759 PRINT " "
760 PRINT " "
761 PRINT " "
762 PRINT " "
763 PRINT " "
764 PRINT " "
765 PRINT " "
766 PRINT " "
767 PRINT " "
768 PRINT " "
769 PRINT " "
770 PRINT " "
771 PRINT " "
772 PRINT " "
773 PRINT " "
774 PRINT " "
775 PRINT " "
776 PRINT " "
777 PRINT " "
778 PRINT " "
779 PRINT " "
780 PRINT " "
781 PRINT " "
782 PRINT " "
783 PRINT " "
784 PRINT " "
785 PRINT " "
786 PRINT " "
787 PRINT " "
788 PRINT " "
789 PRINT " "
790 PRINT " "
791 PRINT " "
792 PRINT " "
793 PRINT " "
794 PRINT " "
795 PRINT " "
796 PRINT " "
797 PRINT " "
798 PRINT " "
799 PRINT " "
800 PRINT " "
801 PRINT " "
802 PRINT " "
803 PRINT " "
804 PRINT " "
805 PRINT " "
806 PRINT " "
807 PRINT " "
808 PRINT " "
809 PRINT " "
810 PRINT " "
811 PRINT " "
812 PRINT " "
813 PRINT " "
814 PRINT " "
815 PRINT " "
816 PRINT " "
817 PRINT " "
818 PRINT " "
819 PRINT " "
820 PRINT " "
821 PRINT " "
822 PRINT " "
823 PRINT " "
824 PRINT " "
825 PRINT " "
826 PRINT " "
827 PRINT " "
828 PRINT " "
829 PRINT " "
830 PRINT " "
831 PRINT " "
832 PRINT " "
833 PRINT " "
834 PRINT " "
835 PRINT " "
836 PRINT " "
837 PRINT " "
838 PRINT " "
839 PRINT " "
840 PRINT " "
841 PRINT " "
842 PRINT " "
843 PRINT " "
844 PRINT " "
845 PRINT " "
846 PRINT " "
847 PRINT " "
848 PRINT " "
849 PRINT " "
850 PRINT " "
851 PRINT " "
852 PRINT " "
853 PRINT " "
854 PRINT " "
855 PRINT " "
856 PRINT " "
857 PRINT " "
858 PRINT " "
859 PRINT " "
860 PRINT " "
861 PRINT " "
862 PRINT " "
863 PRINT " "
864 PRINT " "
865 PRINT " "
866 PRINT " "
867 PRINT " "
868 PRINT " "
869 PRINT " "
870 PRINT " "
871 PRINT " "
872 PRINT " "
873 PRINT " "
874 PRINT " "
875 PRINT " "
876 PRINT " "
877 PRINT " "
878 PRINT " "
879 PRINT " "
880 PRINT " "
881 PRINT " "
882 PRINT " "
883 PRINT " "
884 PRINT " "
885 PRINT " "
886 PRINT " "
887 PRINT " "
888 PRINT " "
889 PRINT " "
890 PRINT " "
891 PRINT " "
892 PRINT " "
893 PRINT " "
894 PRINT " "
895 PRINT " "
896 PRINT " "
897 PRINT " "
898 PRINT " "
899 PRINT " "
900 PRINT " "
901 PRINT " "
902 PRINT " "
903 PRINT " "
904 PRINT " "
905 PRINT " "
906 PRINT " "
907 PRINT " "
908 PRINT " "
909 PRINT " "
910 PRINT " "
911 PRINT " "
912 PRINT " "
913 PRINT " "
914 PRINT " "
915 PRINT " "
916 PRINT " "
917 PRINT " "
918 PRINT " "
919 PRINT " "
920 PRINT " "
921 PRINT " "
922 PRINT " "
923 PRINT " "
924 PRINT " "
925 PRINT " "
926 PRINT " "
927 PRINT " "
928 PRINT " "
929 PRINT " "
930 PRINT " "
931 PRINT " "
932 PRINT " "
933 PRINT " "
934 PRINT " "
935 PRINT " "
936 PRINT " "
937 PRINT " "
938 PRINT " "
939 PRINT " "
940 PRINT " "
941 PRINT " "
942 PRINT " "
943 PRINT " "
944 PRINT " "
945 PRINT " "
946 PRINT " "
947 PRINT " "
948 PRINT " "
949 PRINT " "
950 PRINT " "
951 PRINT " "
952 PRINT " "
953 PRINT " "
954 PRINT " "
955 PRINT " "
956 PRINT " "
957 PRINT " "
958 PRINT " "
959 PRINT " "
960 PRINT " "
961 PRINT " "
962 PRINT " "
963 PRINT " "
964 PRINT " "
965 PRINT " "
966 PRINT " "
967 PRINT " "
968 PRINT " "
969 PRINT " "
970 PRINT " "
971 PRINT " "
972 PRINT " "
973 PRINT " "
974 PRINT " "
975 PRINT " "
976 PRINT " "
977 PRINT " "
978 PRINT " "
979 PRINT " "
980 PRINT " "
981 PRINT " "
982 PRINT " "
983 PRINT " "
984 PRINT " "
985 PRINT " "
986 PRINT " "
987 PRINT " "
988 PRINT " "
989 PRINT " "
990 PRINT " "
991 PRINT " "
992 PRINT " "
993 PRINT " "
994 PRINT " "
995 PRINT " "
996 PRINT " "
997 PRINT " "
998 PRINT " "
999 PRINT " "
1000 PRINT " "

```

Variables

A\$ — Expression input for translation

SP — A 'stack' used to store operators

SP — A 'stack pointer' used to keep track of the end of the stack

A — Loop control variable

appropriate

tors or adds operators to the stack as

under consideration and prints opera-

Considers the priority of the operator

to the stack

Add the operator under consideration

430-450

490-580

DEMONS OF TOPAZ



100% GRAPHIC EXPLORATION



A game of distinction  from British Telecom.

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.

COMMODORE 64

**GOLD
EDITION
£5.95**

PROGRAMS WANTED

TO FILL THIS
SPACE

Up to £20,000 advances payable for programs suitable for
marketing in the UK, Europe, and the USA.



C.S.M. (Consolidated Software Marketing)
Suite 40, Strand House, Great West Road, Brentford, Middx. TW8 9EX. Tel 01-560 4191.

Filed, sealed and delivered

A useful filing program for Dragon 32 users written by W Patton

This is a program that allows you write your own filing system and have as many fields to a file as you want. It takes up 1.5K of memory and can store up to 300 entries.

The program is split up into several sections; Line 10 prints out the menu, Lines 20 and 30 get your command to go to the corresponding section of the program. Lines 40-90 are used by Option 1 where you are requested to type in the number of fields that the file you are creating requires. You then type in each entry, pressing *Enter* after each field has been typed in. When you want to finish typing, you must type 'XX' as the first entry to your last file.

Lines 100-110 are used by Option 2. These allow you to add more files to the end of your file. You enter data for this the same way as for Option 1 using 'XX' to return to the menu.

Line 120 is used by Option 3 and can be used to correct any mistakes made while entering your data. You are required to first state the file that the error is in, then the field. You then type in the new item and it will replace the old one.

Lines 130 and 140 are used by Option 4. This allows you to insert a file anywhere in the large file. You must type in the number at which you want the file to go in at, then you must type in the new file. Line 150 is used by Option 5. You must type in the number of the file that is to be deleted then that file will be erased.

Line 160 is used by Option 6 where the file is saved. You have to type in the name you want to call the file. After pressing *Enter* you are given a pause in which time you should press play and record on your cassette recorder. Line 170 is used by Option 7; the loading routine. You have to type in the name of the file to be loaded. When the file has loaded you return back to the menu.

Lines 180-200 are used by Option 8; the print out routine. You are first asked if you wish it to go to the screen or the printer. Press any key to step through the file. When all the file is printed out the program waits for you to press *Enter* before returning to the menu. Lines 210-230 are used by Option 9, where a word is searched for in the file. You just type in the word you are looking for in full, and the computer will search through the large file until it finds it.

Variables

A	= Number of fields
Array AS	= All of the file
EO	= Length of file + 1 in memory
XS	= General input
A1	= Value of key pressed
F/X	= For next loop variables
NS	= Name of file to load or save
D	= General input

```

5 CLEAR 10000
10 CLS:PRINT"(1) START A NEW FILE":PRINT"(2) A
DD TO A FILE":PRINT"(3) EDIT A FILE":PRINT"(4)
INSERT A FILE":PRINT"(5) DELETE A FILE":PRINT
"(6) SAVE FILE":PRINT"(7) LOAD A FILE":PRINT"(
8) PRINT OUT FILE":PRINT"(9) SEARCH FOR A WORD
":PRINT"COMMAND"
20 XS=INKEY$:IF XS="" THEN 20 ELSE A1=VAL(XS):
IF A1<1 OR A1>9 THEN GOTO 10
30 ON A1 GOTO 40,100,120,130,150,160,170,180,2
10
40 CLEAR:INPUT"HOW MANY FIELDS";A:IF A<0 OR A>
11 THEN 40 ELSE DIM AS(300,A)
50 PRINT"TYPE 'XX' TO END"
60 FOR F=1 TO 300:PRINT"FILE ";F:FOR X=1 TO A
70 INPUT AS(F,X):NEXT X
80 IF AS(F,1)="XX" THEN EO=F:GOTO 10 ELSE NEXT
F
90 PRINT"FILE FULL":GOTO 10
100 FOR F=EO TO 300:PRINT"FILE ";F:FOR X=1 TO
A
110 GOTO 70
120 INPUT"WHICH FILE";F:INPUT"WHICH FIELD";X:1
NPUT"TYPE IN NEW ENTRY";AS(F,X):GOTO10
130 INPUT"WHERE IS NEW FILE TO GO";D:IF D>=EO
THEN GOTO 10 ELSE FOR F=EO TO D-1 STEP -1:FOR
X=1 TO A:AS(F+1,X)=AS(F,X):NEXT X,F
140 EO=EO+1:PRINT"TYPE IN NEW FILE":FOR X=1 TO
A:INPUTAS(D,X):NEXT:GOTO 10
150 INPUT"WHICH FILE IS TOP DELETED";D: IF D>=
EO THEN GOTO 10 ELSE FOR F=D TO EO:FOR X=1 TO
A:AS(F,X)=AS(F+1,X):NEXT X,F:EO=EO-1:GOTO 10
160 INPUT"NAME TO SAVE FILE UNDER";NS:PRINT"PR
ESS PLAY AND RECORD":FOR F=1 TO 1000:NEXT:OPEN
"O",#-1,NS:PRINT#-1,EO,A:FOR F=1 TO EO:FOR X=1
TO A:PRINT#-1,AS(F,X):NEXT X,F:CLOSE#-1:GOTO
10
170 INPUT"NAME OF FILE TO BE LOADED";NS:PRINT"
PRESS PLAY CASSETTE":OPEN"1",#-1,NS:INPUT#-1,E
O,A:FOR F=1 TO EO:FOR X=1 TO A:INPUT#-1,AS(F,X
):NEXT X,F:CLOSE#-1:GOTO 10
180 INPUT"(S)CREEN OR (P)RINTER";XS:IF XS="P"
THEN D=-2 ELSE D=0
190 FOR F=1 TO EO-1:PRINT#D,F:FOR X=1 TO A:PR
INT#D,AS(F,X);" ";:NEXT
200 IF INKEY$="" THEN 200 ELSE PRINT#D:NEXT:IN
PUT"ENTER TO RETURN";X:GOTO10
210 INPUT"TYPE IN WORD";XS:FOR F=1 TO EO:FOR X
=1 TO A:IF AS(F,X)=XS THEN 230 ELSE NEXT X,F
220 PRINT"WORD IS NOT THERE":INPUT"ENTER TO RE
TURN";X:GOTO10
230 PRINTF:FOR X=1 TO A:PRINTAS(F,X);" ";:NEX
TX:PRINT:INPUT"PRESS ENTER TO RETURN";X:GOTO10

```


Salamander Software Discount Club
17 Norfolk Road, Brighton, East Sussex. BN1 3AA

☐ Please send me your full colour catalogue.

Total £ enclosed

Address

Name

Please make cheques/P.O. payable to Salamander Software

Game Price Quantity



Usually £7.95
£3.95
each

EXTRA SPECIALS

£4 off each of these six fabulous games

GAMES COMPENDIUM
NIGHTFLIGHT
STAR JAMMER
GOLF
VULCAN NOUGHTS & CROSSES
SUPER SKILL HANGMAN

THE FRANKLINS TOMB TRILOGY

1. — Franklins Tomb
2. — Lost in Space
3. — Fishy Business
All come complete with 24 page illustrated manual.
£3 OFF EACH were £9.95
NOW ONLY £6.95
SAVE OVER £10
On all 3
Normally £29.85
NOW ONLY £19

ADVENTURE THE CRICKLEWOOD INCIDENT

A weird and wonderful
adventure featuring Arnold
Q. Volstrangler and the
Holy Grail.
£3 OFF — was £7.95
NOW ONLY £4.95
Also available
WINGS OF WAR
World War II adventure
£3 OFF — was £7.95
NOW ONLY £4.95

ARCADE ACTION
All machine code 3-D maze
game amongst the cheese
snuffers.
£3 OFF — was £7.95
NOW ONLY £4.95
AND FROM THE LAMASOFT
STABLE
Lazer Zone
Machine code dricks out for you
Blood!
GRID RUNNER
Machine code action on the GRID
£4 OFF BOTH
Both were £7.95
NOW ONLY £3.95 EACH

**STRATEGIC
DRAGON TREK**
A real time version of this classic
game.
The first and the best
£5 OFF — was £9.95
NOW ONLY £4.95
Also available
WIZARD WAR
Magical combat for 2-9 players
£3 OFF — was £7.95
NOW ONLY £4.95
EVEREST
£4 OFF — was £7.95
NOW ONLY £3.95

**UTILITIES
GRAPHICS SYSTEM**
A comprehensive picture
drawing system. Allows storage
of pictures and text for use in your
own programs on tape.
Text on high-res screens, any
scale or rotation. Shape library.
NOW ONLY £6.95
Also available
DRS
A sophisticated Data Retrieval
System.
£5 OFF — was £14.95
NOW ONLY £9.95

**EDUCATIONAL
TURTLE GRAPHICS**
Based on Logo. A system which
gives you an increased
knowledge of geometry and a
basic understanding of simple
programming. An ideal
educational tool for all ages.
£3 OFF — was £9.95
NOW ONLY £6.95



THE OPENING LETTER
Dear Dragon Owner,
Are you tired of being left in the lurch trying to find
quality Dragon software in the shops? Relax! Now
Salamander Software brings you the Software
Discount Club which offers the best value in one of
the widest ranges available.
As we promised here are the further stupendous
discounts on our entire range — and get free
membership to the Salamander Software Discount
Club and see how much you can save.
Membership gives you further discounts — a
minimum of £2 and possibly much more on any
future order.
If you are already a member you will be entitled to a
quote your membership number when but please
greater bargains will be had on our stand at the
6809 Computer show on the 17th and 18th
November at the Royal Horticultural Halls. So see
you there!
Send today and bring out the best in your Dragon
with the Salamander Software Discount Club.

FREE
POSTERS

FREE
MEMBER-
SHIP

FREE
STOCKERS

NEW

SAGA 1 EMPEROR



Sheer Elegance
AVAILABLE NOW

THE KEYBOARD FOR ZX SPECTRUM COMPUTERS

- * **EASY FITTING**
- * **PLEASURE TO USE**
- * **LONG LASTING**

The Saga 1 Emperor, equipped with 67 keys, is a carefully designed replacement keyboard incorporating many special functions for the popular Spectrum Computer. For business or pleasure, the Emperor will make your computing time more productive and

enjoyable. The SAGA 1 Emperor will enable you to use the Spectrum as a powerful programming tool easier and faster.

The style is easy - for your benefit, the SAGA 1 Emperor has been designed to ensure that available Spectrum Peripherals will fit in the usual manner.

The assembly of the keyboard is simple - and fast. No soldering required, so that within just 5 minutes you can replace your current ZX Spectrum with the new SAGA 1 Emperor.

AND ALL THIS FOR JUST £54.95 (inc. VAT)

SAGA P.C.!

Your very own Personal Carrier, partitioned to neatly accommodate your Spectrum, Saga 1 Emperor and peripherals; Tape Recorder, Power Supply, Cables, manuals and cassettes. Of solid and attractive construction the P.C. is ideal for storing and transporting your computer accessories. The case uses a strong double stitched and bound Black Calf Vinyl with a tough thick ABS inner compartment, leather buckles and a strong handle. Only **£26.95 (inc. VAT)**.

DUSTCOVER

Another top quality product, this expertly produced long-lasting bound and sewn dustcover has been specifically designed for the SAGA 1 Emperor, which will keep everything looking neat and dust free. Only **£4.95 (inc. VAT)**.

THE COLLECTION



SOUNDBOOST

Hear that keyboard click with a SAGA SOUNDBOOST. The SAGA SOUNDBOOST is a tiny electronic circuit which considerably enhances the sound volume and quality of the Spectrum sound output. Adjustable from a whisper to a roar, the SOUNDBOOST provides added realism and excitement for games players and security for programmers (Hear that Keyboard Click!). No cutting, no soldering - just connect. Only **£9.50 (inc. VAT)**.

FLEXICABLE

Developed to relieve your Spectrum from the pressure of life, to fit your Spectrum and your add-ons taking the load with ease. By popular demand we now have two versions of the 9 inch FLEXICABLE available to suit your needs.

Male-Female FLEXICABLE - £12.45
Female-Female FLEXICABLE - £9.50
Converter PCB - £2.95

THE COLLECTION

COLLECTION 1 - SAVE £10.00!!

rrp **£53.85**
Our special price **£43.85**
Includes: Saga Personal Carrier **£26.95**
Soundboost **£9.50**
Dustcover **£4.95**
Flexicable (M-F) **£12.45**

COLLECTION 2 - SAVE £20.00!!

rrp **£108.80**
Our special price **£88.80**
Collection 1 **£53.85**
Saga 1 Emperor **£54.95**

COLLECTION 3 - SAVE £30.00!!

rrp **£238.75**
Our special price **£208.75**
Collection 2 **£108.80**
48K Sinclair ZX Spectrum **£129.95**

The latest addition to our product range is The Collection, providing you with three money saving action packed specials containing quality products - an ideal gift.

DISTRIBUTOR & TRADE ENQUIRIES
CALL NOW ON
WOKING (04862) 22922



Please write to: SAGA Systems Limited,
Dept. 2 Eye Road, Woking, Surrey
Telephone Woking (04862) 69527/22922
or Telex 859298
All prices include VAT
PSP free for Sound Boost and Flexicable.
PSP £1.25 for SAGA 1 Emperor U.K.
£4.00 for SAGA 1 Emperor Europe
£15.00 for SAGA 1 Emperor U.A.E.

Please send me
Name _____
Address _____
The following SAGA PRODUCTS _____
Total amount enclosed £ _____
Please make CHEQUES/P.O. Payable to SAGA Systems Ltd.


ELECTRONICS LTD
Joystick Genies

See the range of Vulcan joysticks and interfaces at your local stockist... we'll see you on the high score tables.

With the Gunshot, you'll have all your enemies covering in corners. 8-directional action and an all-in-one moulded stem allows accurate annihilation and strength to survive those all-night sessions. Dual fire buttons for fading fingers (and a rapid fire version when they're really coming thick and fast). And, if you break it (and we know you'll try) our 12 month guarantee will prove invaluable. The Gunshot plugs directly in to practically all popular home computers (ask about Vulcan interfaces for the BBC, Spectrum, Electron, C16, Plus 4). Only £8.95.



REWRITE THE HIGH SCORE TABLES



In the parallel universe

Perfect Parallel Printing on the Commodore 64 courtesy of **Adrian Warman**

As many users of Commodore equipment will be aware, little provision is made for those who wish to use non-standard equipment, such as Centronics-equipped printers. A growth market for CBM users is the Parallel Printer interface package, which can range from cheap cable and minimal software, up to expensive hardware add-ons that do everything and cost a corresponding amount.

A typical software interface will come with a short cable to connect from the User Port to the Centronics Printer, and a small piece of machine code software. This software will usually reside in the spare Ram from \$C000 to \$CFFF, since this is untouched by Basic. Modifications are made to the Kernal vectors so that any attempt to access a given device number (say six) will re-directed out of the User Port as a parallel *Ascii* code.

Unfortunately, another growth market, extending the Basic on the CBM 64, also tends to produce packages which *also* use the \$C000 Ram. Such a package is the Simons' Basic cartridge, which uses the Ram for a variety of purposes, including Function Key definition. This means that if you want to have a worthwhile language, you may well be unable to use your Parallel Interface Program.

This article lists and describes a reasonably short Basic package which will drive a parallel interface, as long as you have a suitable connecting cable. The routines are detailed, and could be easily converted for use under other languages. For example, the extremely comprehensive Pascal Compiler from Oxford Computer Systems does not support parallel printers, so using the listed routines it is an easy job to define suitable procedures in Pascal to perform all necessary tasks.

The routines supplied are a little slower than machine code equivalents, and they do not check to ensure that the device is present and connected; however, they don't require any of the file channels, leaving them all free for other purposes.

The package consists of three subroutines. One is used to configure the CBM Input/Output chips to control the data lines. The next is used to place an *Ascii* character onto the data lines (and hence send it to any listening device). It will then wait for an acknowledgement that the character has been received. The last routine will restore the CBM I/O chips to prevent the parallel device being accessed further.

As an example of the routines used, a short program is added to the front of the listing which prints out the *Ascii* characters

from number 32 to number 127 inclusive.

Program notes

Line 140

This line calls the subroutine which will perform the equivalent of Basic 'OPEN' instruction. Since no 'file' is being used, no file number needs to be given.

Line 150

This is the start of the loop to print out the ASCII characters from 32 to 127 inclusive.

Line 160

The subroutine to output characters assumes that the ASCII code is stored in variable *CHAR*. If you wanted to use literal characters, you could use something like: *Char = Asc ("a")*.

Line 170

This line calls the subroutine which will perform the equivalent of a Basic *Print#x, Chr\$(y)* instruction. Note that (as stated above) no file is used, and so no file number is required. In addition, the semicolon after the print instruction is always implied. Thus, to simulate a

continued on page 51

100 REM BASIC PARALLEL PRINTER ROUTINES.

```
110 :
120 REM BY A. WARMAN
130 :
140 GOSUB 60010
150 FOR X=32 TO 127
160 CHAR=X
170 GOSUB 60190
180 NEXT X
190 CHAR=13
200 GOSUB 60190
210 GOSUB 60110
220 STOP
230 :
60000 REM OPEN TO PRINTER.
60010 CIA2=56576
60020 POKE CIA2+3,255
60030 POKE CIA2+1,0
60040 POKE CIA2+2,PEEK(CIA2+2) OR 4
60050 POKE CIA2,PEEK(CIA2) OR 4
60060 POKE CIA2+13,16
```

```
60070 RETURN
60080 :
60090 :
60100 REM CLOSE ACCESS TO PRINTER.
60110 CIA2=56576
60120 POKE CIA2+13,0
60130 POKE CIA2+3,0
60140 POKE CIA2+2,PEEK(CIA2+2)
AND 251
60150 RETURN
60160 :
60170 :
60180 REM PRINT OUT CHARACTER
'CHAR'.
60190 CIA2=56576
60200 POKE 49152,PEEK(CIA2+13)
60210 POKE CIA2+1,CHAR
60220 POKE CIA2,PEEK(CIA2) AND 251
60230 POKE CIA2,PEEK(CIA2) OR 4
60240 IF (PEEK(CIA2+13) AND 16)=0
THEN GOTO 60240
60250 RETURN
```


49 MOUNT PLEASANT, TADLEY, BASINGSTOKE, HANTS.

ORIGINAL SOFTWARE DESIGN



Minter

Jeff

AVAILABLE FOR CBM 64, C 16, VIC 20

PSYCHEDELIA — A DANCE WITH RAINBOWS

ONLY SWITCH ON!
SWITCH ON IN THE DARK
SWITCH ON TO MUSIC

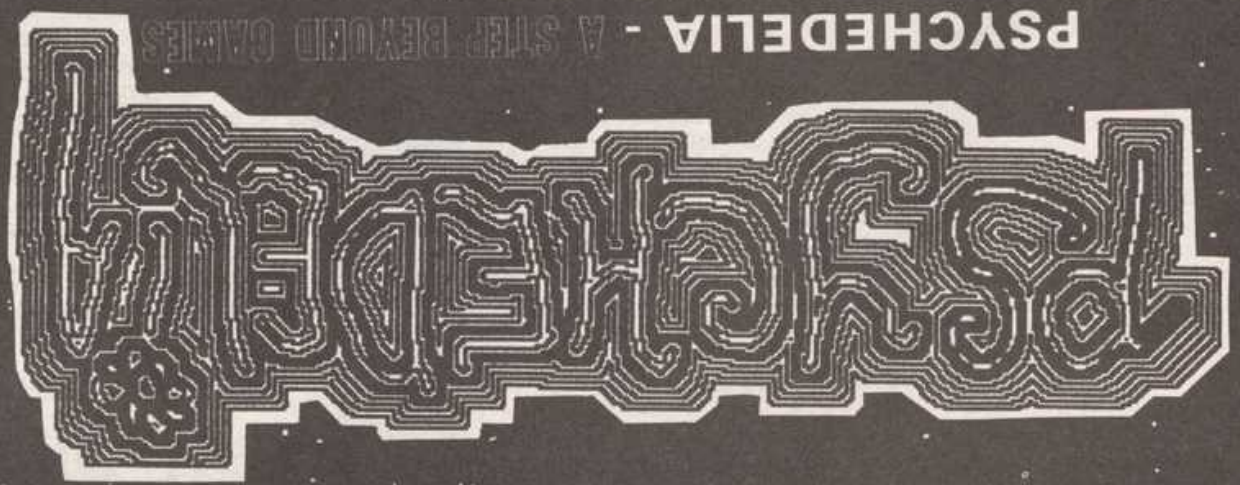
PSYCHEDELIA — AN ENTERTAINMENT

ONLY PLEASURE!
THERE IS NO KILLING
THERE IS NO FRUSTRATION

PSYCHEDELIA — BEYOND COMPETITIVENESS

ONLY ENJOY
YOU CANNOT LOSE
YOU CANNOT WIN

PSYCHEDELIA - A STEP BEYOND GAMES



SHORTLY AVAILABLE FOR ATARI, SPECTRUM, AMSTRAD

Commodore 64

Print#x instruction (which would simply print a carriage return), you should use: *Char = 13:Gosub 60190*.

Line 180

Go and do the next character (if there is one to do).

Lines 190-200

Output an *Ascii* carriage return <CR> character. This corresponds to the *Print#x* as described above, and on most parallel printers ensures that any text left in the input buffer will be printed.

Line 210

This line calls the subroutine which will prevent the I/O chips from trying to access any parallel devices on the User Port, by restoring default values. Halt the demonstration program.

Line 220

Lines 60010 - 70

These lines are responsible for configuring the I/O chips to access the User Port in a manner suitable for controlling a parallel Centronics device. In its absolute minimum configuration, a parallel Centronics port requires eight data lines (called a 'bus'), a *strobe* line to show the parallel

Lines 60010 - 140

device when the data on the bus is valid, and an *acknlg* line to show when the parallel device has accepted the data. The 8-bit bus is set up using Port B of CIA#2, which connects directly to the User Port (program lines 60020-60030). The *strobe* line is bit two of Port A (program lines 60040-60050). Finally, the *acknlg* line is set up using the *Flag* interrupt on CIA#2 (program line 60060).

Lines 60190 - 250

These lines deselect the I/O chips to prevent them accessing the parallel device. The *acknlg* line is disabled so that it can no longer be read (program line 60120). Each of the 8 lines on the data bus is restored to an input line (program line 60130). Finally, the *strobe* line is redefined as an input line (program line 60140).

The key lines of the package. First, a read of the *acknlg* line must be made, in order to check it later (program line 60200) — for the reason, see the *Programmers Reference*

Guide. Note that the data returned is placed in location 49152 simple for convenience! If you wish, you could replace program line 60200 with (say): *Let A = Peek (CIA2+13)*.

Next, the actual *Ascii* code is placed on the data bus (program line 60210). The *strobe* line is switched to show data ready (lines 60220-60230). Since the device may have a delay (such as moving the print head back to the next line), the program must wait for an acknowledgement via the *acknlg* line (program line 60240). Once this has been completed, the character has been sent and received, so we can exit the routine.

Hopefully, you should now see how to modify your own programs in order to incorporate the parallel interface routines. However, this does *not* get over the fact that a connecting cable is still required. Fortunately, these are available as stand-alone items from advertisers in magazines such as this esteemed paper!

Competition result

Flight Competition winner

The winner of the Flight Simulation Competition we ran in the September 6 issue is Simon Watson, aged 19, from Harlow in Essex.

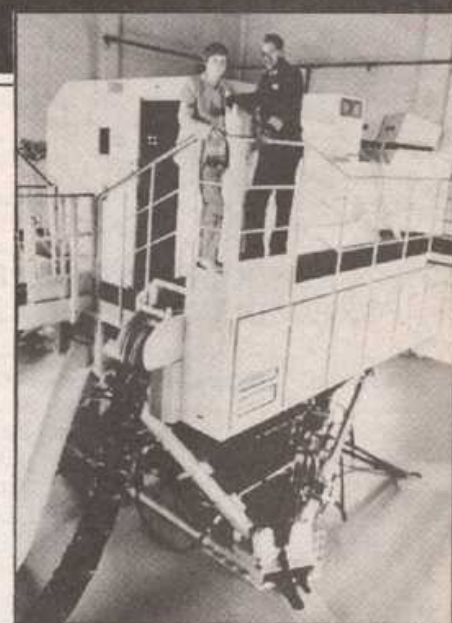
Last week he was awarded his prize — a chance to fly a real flight simulator used to

train commercial airline pilots at British Airways' Cranebrook training centre at Heathrow airport.

British Airways operates three flight simulators at Cranebrook, each of which stands about 40 feet tall and costs a staggering £10m apiece. The machine which Simon spent around two hours flying was a Boeing 757 simulator — a faithful reconstruction of the 757's cockpit supported twenty feet above the ground on powerful hydraulic rams. These are

controlled by two Vax mini-computers to move the cockpit according to the pilot's commands to accurately reproduce the effects of take-off and landing. The illusion is completed with four monitors suspended above the cockpit windows, projecting a high-resolution computer-generated picture of the runway, surrounding buildings, roads and skyline.

It was something of a surprise to discover that Simon already has some flying experience. He hopes to make flying his career and as a first step he



is trying to get private pilot's licence allowing him to fly light aircraft. Even though he has done some flying he has never tried to learn to drive — he says he couldn't afford to do both.

After his two-hour 'flight' he persuaded British Airways' Boeing Training Captain, Roger Benham, to log the simulator 'familiarisation' in his flight record.

Now Simon is looking for a sponsor so that he can continue with his ambition to become a commercial helicopter pilot.



LINKWORD

FRENCH
GERMAN
SPANISH
ITALIAN

"A quick way of learning - quicker than the printed page".

Mike McCann, Your Computer.

"It took 12 hours to teach a regime that would normally take 40 hours".

Peter Marsh, Training Manager, Thomson Holidays.

"Vivid mental images are used as unforgettable memory joggers".

Jane Bird, Sunday Times.

"Before you know it, you are constructing your own sentences".
Mike McCann, Your Computer.

"We found the course great fun and at the end a surprisingly large amount had sunk in".
Which Micro?

"Even a confirmed look-out of the windower like me found concentrating on the course very easy".
Sally Clark, Computer Choice.

"Undoubtedly the linkword cassettes are the most interesting, most enjoyable... of those considered".
Jon Chambers, Next.

"The vocabulary sticks in your mind effortlessly".
Sally Clark, Computer Choice.

"An outstanding success".
Personal Computer World.

FOR SCHOOLWORK
FOR HOLIDAYS

FOR BUSINESS
FOR ALL AGES

Linkword Language Courses are published on

Machine	Publisher	Machine	Publisher
B.B.C. (B)	Acornsoft	Amstrad	Protek
Sirius	A.C.T.	Spectrum	Silversoft
Apricot	A.C.T.	C.B.M. 64	Audiogenic
Apple	A.C.T.	Vic 20	Audiogenic
I.B.M. P.C.	A.C.T.	Oric	Tansoft
Q.L.	Protek	Electron	Acornsoft

All versions contain a programme
an audio tape and glossary.

(Prices from £12.95)

Versions available from
Boots, Smiths and leading retailers.

For further information write to:
Linkword, 41 Walter Road, Swansea.

QUARTERBACK



American
Football
for the
48K
Spectrum

Can you outwit your
opponent and gain the
vital few yards for a
touchdown?

A tactical battle for
1-2 players with full
statistical analysis of
the game

* microdrive compatible
* play by mail league with
FREE entry

ONLY £5.00 including
p+p from
NAB SOFTWARE
7 Oakwood Drive
Aspley
Nottingham
NG8 3LZ

NOW
3RD
GREAT
YEAR!

HIRE SPECTRUM
2X81 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

SPECIAL OFFER!
YOUR FIRST TWO
TAPES FREE

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

FREE
ILLUSTRATED
QUARTERLY
MAGAZINE WITH
TIPS, NEWS,
REVIEWS
DISCOUNT OFFERS

LIFE
MEMBERSHIP
£5.00
TAPE HIRE FROM
50P
INCLUDING VAT

OVER
14,000
DELIGHTED MEMBERS!

■ 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 limited (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 (rarely) 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.
POWK



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.

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

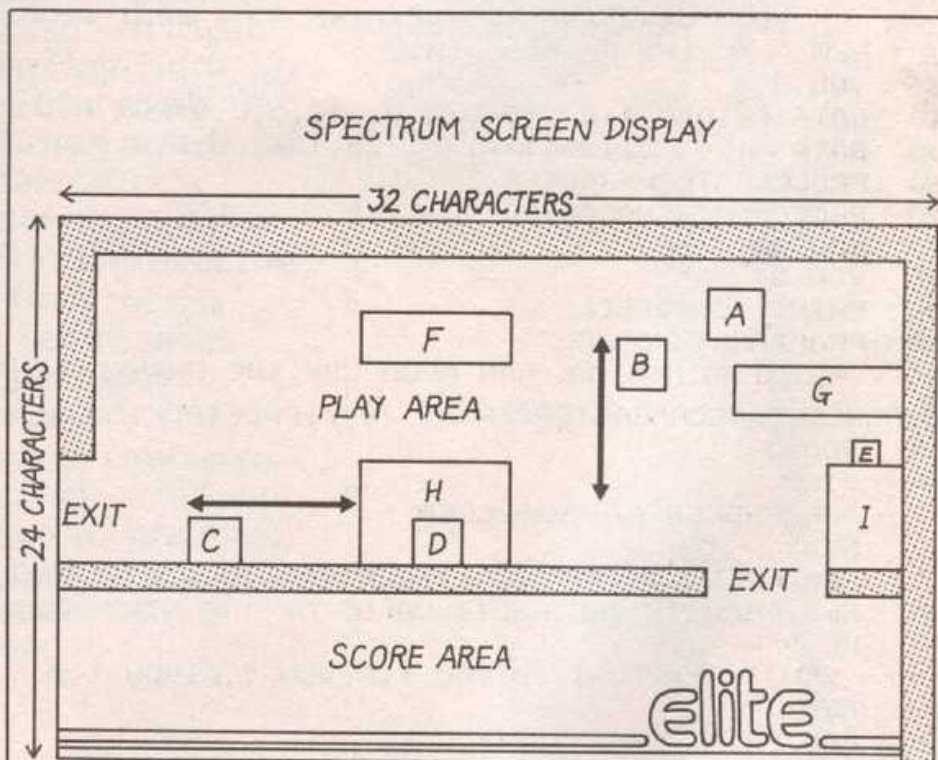
Completed storylines and storyboards should be submitted to Kokotoni Wilf Competition, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP, to arrive no later than 1 January 1985.

All entrants requiring an acknowledgement 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.

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."



TIME-ZONE 3: SCREEN 1

- A: STARTING POSITION OF KOKOTONI WILF.
- B: STARTING POSITION OF 'BOOK' SPRITE
- C: STARTING POSITION OF 'BOILING POT' SPRITE
- D: ANIMATED 'FIRE' SPRITE
- E: LOCATION OF AMULET FRAGMENT
- F, G, H, I: SKULL SHELF; POTS SHELF; OPEN RANGE; SKELETON.

BOLD ARROWS SHOW SPRITE MOVEMENT PATTERNS.
SHADED AREA SHOWS IMPENETRABLE BORDERS.

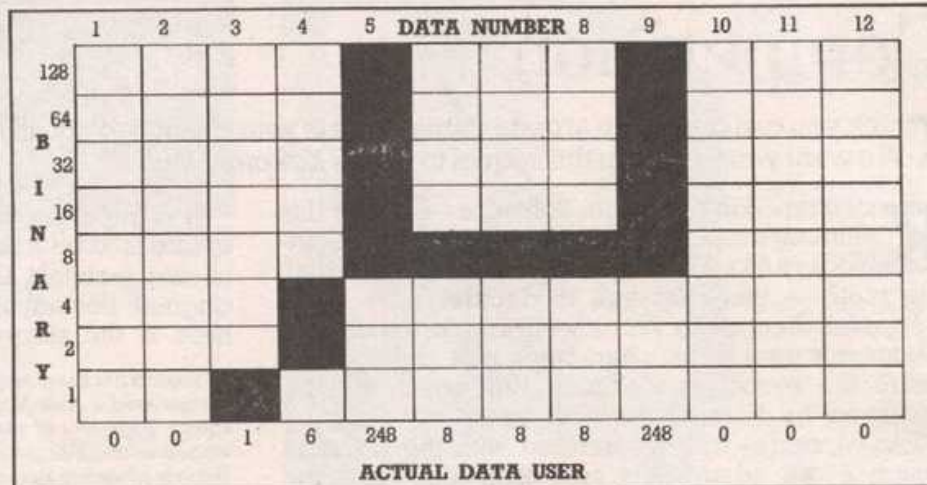
Reform your character

User-defined graphics on your Epson made easy on the BBC B by A Fennell

This program allows you to produce User Defined Graphics on the Epson FX80 printer. The character is defined on an 8 by 12 grid (see right) — as explained in the printer manual — and these values are stored in the Data statements at Lines 40 & 50.

The first numbers are the *ASCII* codes for the characters to be changed, ie [=91. Any character could be used.

As I have shown in the program, the UDG can be used with normal characters (once it has been defined) but the printer must be set back to the original character set, using *Procbacktonormal*, (see Line 120 for example). I have created a μ and a # sign as examples, but the only real limit is your own inventiveness.



```

10 REM program to produce UDG on the FX-80 printer.see page 3-38
    of manual.produces a mu sign VDU2 enables the printer
    VDU3 disables the printer VDU1 sends next character to
20 REM the printer only
30 VDU 2
40 DATA 64,0,0,1,6,248,8,8,8,248,0,0,0:REM @ => MU ON PRINTER
50 DATA 91,0,36,126,126,36,126,126,36,0,0,0,0:REM [ => £ ON PRINTER
60 PROCCREATECHARACTER
70 PROCCREATECHARACTER
80 VDU 3
90 VDU 2
100 PRINT "####[]"
110 PROCBACKTONORMAL
120 PRINT:PRINT "WE CAN ALSO USE THE CHARACTER ";:RESTORE
40:PROCCREATECHARACTER:PRINT "@"::PROCBACKTONORMAL:PRINT " IN A SENTENCE"
130 VDU 3
140 STOP
150 DEF PROCCREATECHARACTER
160 REM
170 REM PRINT CHR$(27); "&"; CHR$(0); CHR$(£); CHR$(£);
180 REM READ IN THE ASCII VALUE OF THE NEW CHARACTER
190 READ A
200 VDU 1,27:VDU 1,38:VDU 1,0:VDU 1,A:VDU 1,A
210 REM
220 REM PRINT CHR$(139);
230 VDU 1,139
240 REM
250 REM DEFINE THE 8*12 SHAPE FOR THE CHARACTER
260 FOR I=1 TO 12:READ A:VDU 1,A:NEXT
270 REM
280 REM PRINT CHR$(27); "%"; CHR$(1); CHR$(0)
290 VDU 1,27:VDU 1,37:VDU 1,1:VDU 1,0
300 ENDPROC
310 DEF PROCBACKTONORMAL
320 REM return printer characters to normal
330 VDU 1,27:VDU 1,37:VDU 1,0:VDU 1,0
340 ENDPROC

```




Bristles



JOYSTICK
REQUIRED

Bristles, outrageous graphics, dazzling game play, testing quick reactions, concentration, logic and strategy, it is mind (and joy-stick) boggling!! Featuring Sex-Select, you can choose either boy or girl painters.

Bristles features different game screens and skill levels for each building. Scramble to paint the entire building while avoiding the smart Bucket Chucker, Dumb Buckets and flying Half-Pints.

Take the lifts, climb the stairs and watch out for the caretaker's daughter; she puts her hand prints all over the place! Then there's prizes, candy canes, "invisible paint" . . .

With fully animated characters, (music) sound effects, multiple screens and beautiful graphics, you can't help but want to add Bristles to your collection of Spectrum games.



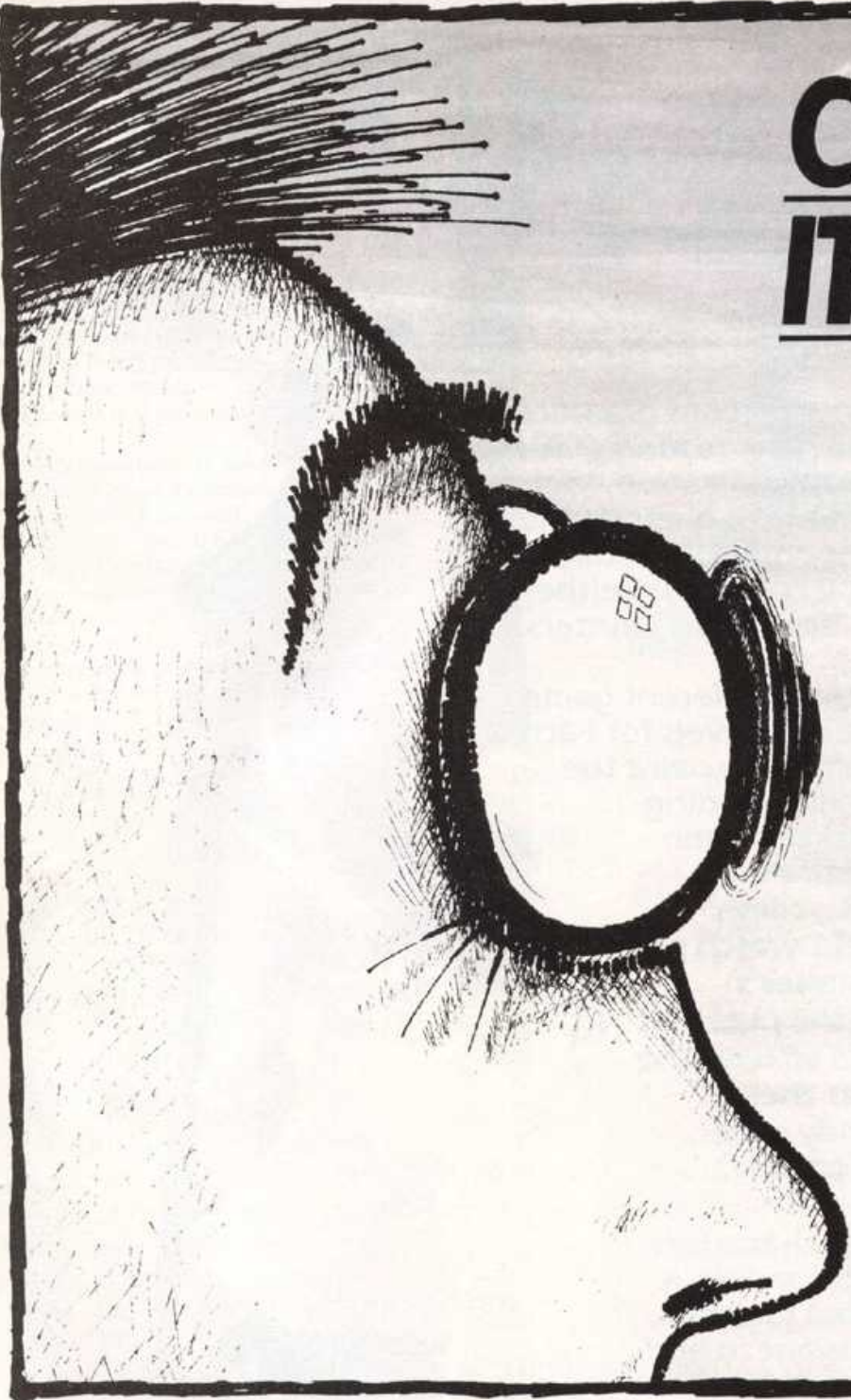
48 LEVELS

For The Sinclair Spectrum 48k £7.95

State Soft Limited Business & Technology Centre Bessemer Drive
STEVENAGE Hertfordshire SG1 2DX Tel: (0438) 317583



CBS COMPUTER IT MAKES EVERYTHING LOOK JUST DIFFERENT



If you're tough, you'll still need to be tougher. If you're quick, you'll still need to be quicker. If you're smart, you'll still need to be smarter.

Because CBS Computer Software is here with EPYX — a range of action-strategy programs from the U.S. that will make whatever you've played before look like just a game.



PIT STOP

The thrills and spills of the race track where a split second can mean win or lose and the player controls car and pit crew.



IMPOSSIBLE MISSION

Incredible graphics, sound and speech. A spectacular mixture of puzzle solving, adventure and arcade style action.



BREAKDANCE

All the music and movement of the craze that's sweeping the nation brought slap bang on to your TV screen.



SILICON WARRIOR

Competition in the world of computer programs where universal domination is the prize.



TEMPLE OF APSHAI

A classic mixture of priceless treasures, hungry monsters and heroic deeds.

TER SOFTWARE. EVERYTHING ELSE PLAIN SOFT.



EPYX come on disk or cassette and, for the first time in the U.K., both systems are available in one-size packaging, colour coded for hardware compatibility.

EPYX from CBS Computer Software. They're good. Play them and find out the hard way just how good. Look out for the first eight adventures now.



JUMP MAN

Running, jumping, climbing; an incredible 3D arcade games all rolled into one, with great graphics, colour and sound.



DRAGONRIDERS OF PERN

Based on a series of best-selling novels, it's got breathtaking graphics, cut-throat strategy and unusual play-action.



LUNAR OUTPOST

3-D combat on the surface of the moon with the future of Planet Earth at stake.



FOR COMMODORE 64

EPYX
COMPUTER SOFTWARE

Available from all good software outlets. Authorised dealers order from: The Software Sales Service. Tel: 01-636 6433/4. CBS Computer Software, Ashbrook House, 3-5 Rathbone Place, London W1.

No man's land

ORIC/ATMOS

OTHER TITLES FOR CBM64/V20 SPECTRUM ZX81 AVAILABLE ON REQUEST



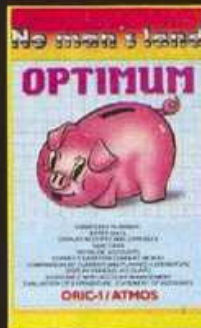
0503 CATEG-ORIC (action game). Take command of a cruiser engaged in battle against fighter planes and submarines. Use the radar and sonar systems to detect and destroy the enemy before you are sunk. £ 7.95



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



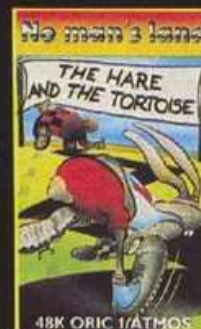
0514 THE DIABOLICAL TOWER (adventure). The Diabolical Tower has 60 floors, each one fraught with danger. Your mission is to seek out the treasure. £ 8.50



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, down and counting. The hare and the tortoise decide to race. Who will win? The level of 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 £ 8.95
- 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 WATERY LANE DARWEN LANCASHIRE

PRICES INCLUDE POSTAGE AND PACKING FOR UK ONLY OVERSEAS ADD £2.

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 Tech.

NAME

ADDRESS

POSTCODE

POWERFUL UTILITIES

AMSTRAD

SPEEDMASTER FAST LOAD UTILITY

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

ONLY £7.95

B.B.C.

TAPE TO DISC UTILITY

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

ONLY £9.95

ATARI

TAPE TO DISC UTILITY

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

ONLY £9.95

COMMODORE 64

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

DISC DISECTOR

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

ONLY £29.95

QUICKDISC

Incorporating Menu Maker

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

ONLY £11.95

FASTBACK Fast Load Utility

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

A **very professional** program.

ONLY £9.95

DISCO

THE TAPE TO DISC UTILITY

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

ONLY £9.95

HARDWARE

DOUBLER

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

ONLY £12.95

ROCKET

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

ONLY £7.95

BIGMOUTH

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

ONLY £7.95

COMMODORE CONNEXION

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

Simple to use and very reasonably priced.

ONLY £14.95



3M SCOTCH
DISCS
S.S.D.D.

£16.00

LIFETIME
GUARANTEE
BOX OF TEN



DATA RECORDER

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

SATISFACTION GUARANTEED.
ONLY £29.95

HUGE RANGE OF SOFTWARE & BOOKS FOR BBC, ELECTRON, SPECTRUM, COMMODORE 64, VIC 20, ORIC, DRAGON, MEMOTECH & ZX 81

Trade and Overseas Orders welcome.
All prices inclusive. Send Cheque, P.O., Bank Draft or phone your Card Number to 0386 49641.



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

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

Routine input

For easier inputting and editing of your data a program from M J Amess

This program consists of one major procedure, called *Cinput*, which provides a convenient method for accepting data from the user's terminal. It provides a number of data formats to allow almost any type of data to be entered and checked for validity.

This routine can reside at the end of your own programs and be called whenever data input is required. It is called by typing *Cinput* and is followed by a list of formal parameters, which will supply data for the procedure. To see what formal parameters are used look at Line 30020 which defines the procedure. The parameters used are, *Row*, *Col*, *Max*, *Min*, *Types*, *Old Ink*, *Old Paper*. *Row* and *Col* define the screen coordinates at which the data is to be accepted. *Max* and *Min* are used to define the maximum and minimum number of characters that are to be accepted by the procedure.

The *Cinput* procedure types periods (.) at the specified screen position to show the user the maximum number of characters allowed (taken from the value entered in the *Max* variable). In case of an error whilst

entering data, messages are displayed in Screen #0.

The most important parameter that must be entered is *Types*. This is a one or two character string defining the type of data to be entered. There are eight main types which are:

- 1) 'D' = Enter a date, in the format DDMMYY. This is edited for a valid Day and Month and redisplayed in DD/MM/YY format.
- 2) 'A' = Alphanumeric. All characters are valid.
- 3) 'In' = Enter any positive integer numeric.
- 4) 'N' = Accept any positive numeric and display it in a monetary form. The numeric is entered without a decimal point. For example, if 10021 is entered this is automatically redisplayed as 100.21.
- 5) 'NN' = Negative numeric. This is exactly the same as the 'N' type except that the numeric entered is changed to a negative. The user enters the numeric as a positive and the computer redisplayes the value as a negative.
- 6) 'Y' = Accept Yes/No or Esc. The computer will await the user to press either the 'Y', 'N'

or 'Esc' keys. Pushing the 'Enter' key will have the same effect as pushing the 'Y' key.

7) 'P' = Accepts an alphanumeric password. This type uses the *Old Ink* and *Old Paper* variables so that any typed data is not displayed in a visible form on the screen. These two variables must be set to the current *Ink* and *Paper* values that are being used.

8) 'V' = Verification — accepts only a carriage return (enter key).

All data which is entered is stored in the variable *Entry\$*, even numeric data, which can be stored later in a numeric variable.

One final facility is that instead of entering the expected data you may enter *End* (or push the Esc key in the 'Y' option). This sets a variable, *Inxctl*, to 3 which could signify that the user wishes to escape from a particular option within his/her program. During normal use *Inxctl* will be set to zero if the procedure is completed Ok. If 'Y' is pushed in the Yes/No field then *Inxctl* is set to 1, or if 'N' is pushed then *Inxctl* will equal 2.

The following is an example of the *Cinput* procedure. Type, *Cinput 10,5,20,5,'A'*.

This will accept any alphanumeric data at position 10,5 on the terminal. The maximum number of characters that will be accepted is 20 and the minimum is 5. Please note that the *Ink* and *Paper* variables need only be entered when using the password option.

```

30000 REMARK ENHANCED INPUT ROUTINE
30005 REMARK COPYRIGHT 1984 M.J.AMESS
30010 REMARK VERSION RS1.0A 19/08/84
30015 REMARK ** **
30020 DEFINE PROCEDURE CINPUT(ROW,COL,MAX,MIN,
TYPE$,OLD_INK,OLD_PAPER)
30025 INXCTL=0:CLS #0
30030 IF TYPE$="D" THEN DATE_ENTER
30035 IF TYPE$="A" THEN ALPHA
30040 IF TYPE$="N" OR TYPE$="NN" OR TYPE$="IN"
THEN NUMERIC
30045 IF TYPE$="Y" THEN YES_NO
30050 IF TYPE$="P" THEN PASSWORD
30055 IF TYPE$="V" THEN VERIFY
30060 END DEFINE CINPUT
30065 REMARK ***** ENTER DATE *****
30070 DEFINE PROCEDURE DATE_ENTER
30075 MIN=6:MAX=6
30080 REPEAT LOOP
30085 ENTER_VALUE
30090 IF INXCTL=3 THEN EXIT LOOP
30095 SET=0
30100 MAX=6:MIN=6:CHK_LENGTH:IF SET THEN GO
TO 30085
30105 MONTH$=ENTRY$(3 TO 4):YEAR$=ENTRY$(5
TO 6)
30110 DTE$=ENTRY$(1 TO 2)
30115 IF MONTH$ < 1 OR MONTH$ > 12 THEN SET=1
30120 IF DTE$ > 31 OR DTE$ < 1 THEN SET=1
30125 IF DTE$ > 29 AND MONTH$=2 THEN SET=1
30130 IF MONTH$=4 OR MONTH$=6 OR MONTH$=9 OR
MONTH$=11 THEN
30135 IF DTE$=31 THEN SET=1
30140 END IF
30145 IF NOT SET THEN EXIT LOOP
30150 END REPEAT LOOP
30155 IF INXCTL <> 3 THEN

```

```

30160 AT ROW,COL:PRINT DTE$,"/"/MONTH$,"/"/
YEAR$
30165 END IF
30170 END DEFINE DATE_ENTER
30175 REMARK ***** ENTER ANY ALPHANUMERIC
*****
30180 DEFINE PROCEDURE ALPHA
30185 REPEAT LOOP
30190 ENTER_VALUE
30195 IF INXCTL=3 THEN EXIT LOOP
30200 SET=0:CHK_LENGTH
30205 IF NOT SET THEN EXIT LOOP
30210 END REPEAT LOOP
30215 END DEFINE ALPHA
30220 REMARK ***** ENTER NUMERIC *****
30225 DEFINE PROCEDURE NUMERIC
30230 REPEAT LOOP
30235 ENTER_VALUE
30240 IF INXCTL=3 THEN EXIT LOOP
30245 SET=0:CHK_LENGTH
30250 IF SET THEN GO TO 30235
30255 SET=0
30260 FOR VALUE=1 TO LEN(ENTRY$)
30265 IF CODE(ENTRY$(VALUE)) < 48 OR CODE(ENT
RY$(VALUE)) > 57 THEN SET=1
30270 END FOR VALUE
30275 IF SET THEN GO TO 30315
30280 IF TYPE$="IN" THEN GO TO 30315
30285 IF LEN(ENTRY$)=2 THEN ENTRY$="0" &
ENTRY$:GO TO 30295
30290 IF LEN(ENTRY$)=1 THEN ENTRY$="00" &
ENTRY$
30295 LINE$=ENTRY$(1 TO ((LEN(ENTRY$))-2))
30300 LINE$=LINE$ & "." & LINE$=LINE$ & ENTRY$(
LEN(ENTRY$)-1 TO LEN(ENTRY$))
30305 ENTRY$=LINE$
30310 AT ROW,COL:CLS #1,4:PRINT ENTRY$
30315 IF NOT SET THEN EXIT LOOP

```



```

30320 END REPEAT LOOP
30325 IF TYPE$="NN" THEN
30330 ENTRY$="" & ENTRY$
30335 AT ROW,COL:CLS #1,4:PRINT ENTRY$
30340 END IF
30345 END DEFINE NUMERIC
30350 REMARK ***** SELECT "Y","N" OR ESC *****
30355 DEFINE PROCEDURE YES_NO
30360 MIN=1:MAX=1
30365 REPEAT FIND_LOOP
30370 DOT:PRINT "Y" AT ROW,COL
30375 A=CODE(INKEY$(1))
30380 IF A=78 OR A=89 OR A=27 OR A=10 THEN EXIT FIND_LOOP
30385 END REPEAT FIND_LOOP
30390 IF A=27 THEN AT ROW,COL:PRINT "ESC":
INXCTL=3
30395 IF A=78 THEN INXCTL=2:AT ROW,COL:PRINT "N":
30400 IF A=89 OR A=10 THEN INXCTL=1
30405 END DEFINE YES_NO
30410 REMARK ***** ENTER PASSWORD *****
30415 DEFINE PROCEDURE PASSWORD
30420 INK OLD_PAPER
30425 REPEAT LOOP
30430 ENTER_VALUE
30435 IF INXCTL=3 THEN EXIT LOOP
30440 SET=0:CHK_LENGTH
30445 IF NOT SET THEN EXIT LOOP
30450 END REPEAT LOOP
30455 INK OLD_LINK:PAPER 0
30460 END DEFINE PASSWORD
30465 REMARK ***** VERIFICATION *****

30470 DEFINE PROCEDURE VERIFY
30475 MAX=0:MIN=0
30480 REPEAT LOOP
30485 SET=0
30490 ENTER_VALUE
30495 CHK_LENGTH:IF NOT SET THEN EXIT LOOP
30500 END REPEAT LOOP
30505 END DEFINE VERIFY
30510 STOP
30515 DEFINE PROCEDURE DOT
30520 AT ROW,COL:CLS #1,4
30525 IF TYPE$="P" THEN INK OLD_LINK
30530 PRINT (FILL$(1,MAX))
30535 AT ROW,COL
30540 IF TYPE$="P" THEN INK OLD_PAPER
30545 END DEFINE DOT
30550 DEFINE PROCEDURE ENTER_VALUE
30555 AT ROW,COL:CLS #1,4
30560 DOT:INPUT ENTRY$
30565 IF ENTRY$="" THEN RETURN
30570 IF ENTRY$(1 TO 3)="END" AND LEN(ENTRY$)=3 THEN INXCTL=3
30575 END DEFINE ENTER
30580 DEFINE PROCEDURE CHK_LENGTH
30585 IF LEN(ENTRY$) > MAX THEN
30590 INPUT #0;"ENTRY TOO LONG - CR TO CONTINUE":A$:CLS #0:SET=1
30595 END IF
30600 IF LEN(ENTRY$) < MIN THEN
30605 INPUT #0;"ENTRY TOO SHORT - CR TO CONTINUE":A$:CLS #0:SET=1
30610 END IF
30615 END DEFINE CHK_LENGTH

```



THE FABULOUS

ONLY £9.95
(INC. P&P and VAT)

CASSETTE

50

FROM



VALUE that's out of this world

50 GAMES ON ONE CASSETTE

NOW AVAILABLE FOR Commodore 64 ELECTRON Atmos
 DRAGON BBC A/B Spectrum Apple ATARI ORIC-1 ZX81 VIC-20

EXPRESS DELIVERY-ORDER NOW

Name _____

Address _____

Post Code _____

Country _____

WE PAY TOP PRICES FOR TOP QUALITY GAMES

Please send me by return of post, Cassette 50 at £9.95 per tape. I enclose a cheque/postal order for

£ _____ made payable to Cascade Games Ltd.

Please debit my ☐ No. _____

COMMODORE 64 <input type="checkbox"/>	VIC 20 <input type="checkbox"/>	ORIC 1 <input type="checkbox"/>	BBC A/B <input type="checkbox"/>
SPECTRUM <input type="checkbox"/>	ELECTRON <input type="checkbox"/>	ZX 81 <input type="checkbox"/>	APPLE <input type="checkbox"/>
ATARI <input type="checkbox"/>	ATMOS <input type="checkbox"/>	DRAGON <input type="checkbox"/>	<input checked="" type="checkbox"/>

Cascade Games Ltd.,
 Suite 4, 1-3 Haywra Crescent, Harrogate,
 North Yorkshire, HG1 5BG, England.
 Telephone: (0423) 504526.

PCW 8/12/84

Dealers & Stockists enquiries welcome.

You haven't lived until you've died in

MUD



"MUD leaves other adventures for dead"
PERSONAL COMPUTER
WEEKLY

"I'll admit to being hooked"
POPULAR
COMPUTING

From Century Communications Ltd
Now available on
CompuNet
CENTURY

Party Games

Having a Party? You need Party Games.
The computer games that you play together!
3 exciting new games on one tape
Horse Racing
Dancing Elephants
Play musical chairs with dancing elephants. For children of all ages.
Computer Bingo
Displays cards on screen. Print or copy out extra cards.
the computer calls, automatic or manual checking.
All 3 games for £7.50 — for Spectrum 48k & BBC Model B
* Also *
Cook with your Computer — Spectrum 48k only
Select your ingredients the computer finds the recipes — Choose from
Whotatoes * Continental * Quick Cook
over 70 recipes on each tape — "It's so easy to use"
£5.50 per tape or £14.95 the set
All products Guaranteed and Available now from:
PMCS, Station House, Pickhill, Thirsk, YO7 4JF. Tel: 0845 (Thirsk) 567415
Price includes p & p.

THE MEGASAVE FANTASTIC SAVINGS

PSI WARRIOR	6.85	RAID OVER MOSCOW	8.50	ASTROBIT	5.85	KNIGHT LORE	8.50
AMERICAN FOOTBALL	8.50	PSYTRON	4.95	MUTANT MONY	8.75	VALKYRIE 17	8.75
CURRAH SPEECH	27.50	SKY RANGER	12.95	GREAT SPACE RACE	6.85	BTTL CAR	8.50
SPY VS SPY	8.50	DOLEDER DASH	6.85	KNIGHT LORE	8.50	UNDEADWORLD	8.50
TAPPER	4.50	JEWELS OF BABYLON	4.95	TRAVEL TRASHMAN	5.95	TRAVEL TRASHMAN	5.95
BLUEMAX	8.50	SON OF BLAUGHER	4.95	HOUSE JACK BUILT	5.95	HOUSE JACK BUILT	5.95
MATCHPOINT	8.50	ALLEN	6.85	MACHINE LIGHTNING	17.50	ALLEN	6.85
CAD CAM WARRIOR	8.50	ALIEN	6.85	ALIEN	6.85	ALIEN	6.85
MOTOR CROSS	8.50	SPACE SHUTTLE	4.95	SPACE SHUTTLE	4.95	SPACE SHUTTLE	4.95
WHITE LIGHTNING	17.50	JACK ATTACK	8.50	SPIRIT OF THE STONE	12.95	SPIRIT OF THE STONE	12.95
MUTANT MONY	8.50	HUNCHBACK II	5.85	KONG STRIKES BACK	8.50	KONG STRIKES BACK	8.50
HUNCHBACK II	8.50	TRIPPODS	5.85	TRIPPODS	5.85	TRIPPODS	5.85
ALIEN	7.85	ALIEN	7.85	ALIEN	7.85	ALIEN	7.85
COMMODORE	8.50	STAFF OF KARMAH	8.50	STAFF OF KARMAH	8.50	STAFF OF KARMAH	8.50
STATE WHICH MICRO FAST	9.50	STATE WHICH MICRO FAST	9.50	STATE WHICH MICRO FAST	9.50	STATE WHICH MICRO FAST	9.50
SEND CHECKUP P.O. TO	8.50	SEND CHECKUP P.O. TO	8.50	SEND CHECKUP P.O. TO	8.50	SEND CHECKUP P.O. TO	8.50
POST & PACKAGING FREE	8.50	POST & PACKAGING FREE	8.50	POST & PACKAGING FREE	8.50	POST & PACKAGING FREE	8.50
Westbourne Terrace,		Westbourne Terrace,		Westbourne Terrace,		Westbourne Terrace,	
MEGASAVE Dept 1, 76		MEGASAVE Dept 1, 76		MEGASAVE Dept 1, 76		MEGASAVE Dept 1, 76	
London W2		London W2		London W2		London W2	

DRAGON DISC DRIVES

LIMITED STOCKS — ORDER NOW FOR XMAS —
PRICES INCLUDE VAT AND DELIVERY
Single DRAGON Disk Drive with controller £195
Special Offer DRAGON 64 + disk drive + FLEX/ED/ASM/D BASIC £399.99
SPECIAL XMAS OFFERS
Single disk drive + FLEX/ED/ASM/D BASIC 41 only £280.00
plus FREE 10 diskettes with every order over £250

Please phone or write for availability of FLEX/DBASIC for TANDY, Double Disk Drives, Disk Drive Upgrade kits, software for FLEX/OS9/DRAGON/TANDY COCO
EDIT+ now available for DRAGON FLEX/TANDY RS-DOS/DRAGON DOS and on cartridge

COMPUSENSE

PO Box 169 Palmers Green, London N13 5XA
Tel: 01-882 0681 (24-hr) and 01-882 6936
Alcorn
NSA

QL POWER

AT YOUR FINGERTIPS FROM COMPUTER ONE



PASCAL £39.95 inc. VAT & p&p

Computer One PASCAL is a powerful implementation of this classic programming language. Produced specifically for the QL, this package provides a professional and highly educational programming system. Complete with comprehensive 80 page manual, this is the ultimate language package that no QL enthusiast can do without.

INCLUDES: • Full Screen Editor • QL graphics and sound extensions
• Example programmes • Complete 87 page User Guide
• Full implementation close to ISO-standard • Typically 15x faster than BASIC

FORTH £29.95 inc. VAT & p&p

FORTH is easy to learn, highly efficient, and allows you to explore the full capabilities of your QL. Computer One FORTH is a full implementation of the latest FORTH-83 standard with graphics and sound extensions, and may be used to produce machine code applications for your QL. Ideal for writing real-time or games programs.

INCLUDES: • FORTH-83 system • Forth Screen Editor • 48-page manual
• QL graphics and sound extensions • Example FORTH programs

ASSEMBLER £29.95 inc. VAT & p&p

COMPUTER ONE Assembler is a comprehensive assembler program toolkit providing a professional multitasking assembler written in machine code for speed and compactness. An ideal package for the machine code programmer, allowing you easy access to the QDOS operating system, and integration to your Superbasic and Pascal programs.

INCLUDES: • 68008 Assembler • Full Syntax Checking • Full screen editor
• Comprehensive User Manual • Integrates to Pascal and Superbasic

TYPING TUTOR £19.95 inc. VAT & p&p

Let your Sinclair QL teach you to type! Computer One's Typing Tutor is a fast, easy and enjoyable way of learning true touch-typing on your QL.

INCLUDES: • Self-paced tutorials
• Speed and accuracy diagnosis
• Interactive colour graphics
• User Guide

computer ONE

SCIENCE PARK, MILTON ROAD, CAMBRIDGE

Name _____

Address _____

Signed _____

Tick Order

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>



Method of Payment-
by cheque or P.O. (no cash) and made payable to
COMPUTER ONE, or by charge card.
Access Card No. _____

Total amount £ _____
enclosed with order
Credit card sales: UK buyers only. Tel: (0223) 862616



Inside Arnold

It is interesting to note that although the CPC 464 has been readily available since July, the reports of 'bugs' have

Amstrad.
In complete contrast to other computer

I type in the basic program exactly as listed, paying special attention to the Hex num-

Listing A — The Basic Program

program for those without an assembler.

case a Disassembly of the Kom is of much

Program Notes

Line 20 sets `kamtop`.

the basic program self-addresses, leaving the machine-code in reserved memory.

program.

way one is less likely to confuse it with a

[illegible]

Lines 110 to 410 contain the data representing the machine code.

Listing B — the Assembler Listing

The assembly listing was not written to be a model of assembly programming, nor to be the most efficient method or even a structured method. It was written to investigate the use of Rom routines and as such it is worth examination. It undoubtedly will extend to a full blown monitor. If you attempt this you will discover that the *Concise Firmware Specification* has everything you need.

Program Notes

Lines 5-250 define the text for a simple menu and label some Rom routines for the program proper. Lines 260-880 place menu to screen using colours and pass to Line 1680 (Holdup).

Holdup awaits input and then passes control to the appropriate routine. You should be able to follow from there the routines for outputting the hex-dump and character dump. Note the highlighting of Ascii-characters in the dump, by use of colour changes. The Rom routines used (with their official names) are:

- #BB8A Txt Output — Outputs a character or control code to the text VDU.
- #BB18 Km Wait Key — Waits for next key from the keyboard.
- #BB1B Km Read Key — As #BB18 but doesn't wait.
- #BB90 Txt Set Pen — Set ink for writing colours.

- #B900 KI U Rom Enable — Turn on the Upper Rom.
- #B903 KI U Rom Disable — Turn off the Upper Rom.
- #B906 KI L Rom Enable — Turn on the Lower Rom.
- #B909 KI L Rom Disable — Turn off the Lower Rom.
- #BB75 Txt Set Cursor — Set cursor position.
- #BB7E Txt Cur Disable — Disallow cursor display.
- #BB8D Txt Wr Char — Write a character to the screen — control codes are printed and not obeyed.
- #BB03 Km Reset — Reset key manage, clear all buffers, restore standard key expansions and indirections.

Using the Program

When initiated the program offers a Menu. First press *Caps Lock* and then press the letter corresponding to the memory you wish to examine.

L will bein the hex and character dump of *Low Rom* from address 0 (it actually starts somewhat later) to #3FFF. It will stop at the end and return to Menu. *H* will similarly deal with the *High Rom* ending at #FFFF. *R* deals with all *Ram* up to #BFFF (the memory that follows is the default screen memory).

Enter will stop the display to allow closer inspection. Also whilst 'stopped' you have the option to rapidly advance the memory display in increments of 256-bytes by pressing *I*. When the indicator reaches the desired address press *C* to continue. Alternately *E* will return to Basic or *Q* will return

Menu. *Enter* will resume display and scroll.

Screen Display

From left to right the screen display consists of: Hex Address; eight hex values (the first corresponds to the Hex Addr. The remainder correspond to the previous address plus 1).

These are then followed by the character representation of the hex values. The next line increments the address by 8 and so on.

The hex dump is interesting, as it displays text embedded in the operating system. In Low Rom you will discover after the titles some strange names — Schneider for example. Even Arnold, the pet name for the machine, is mentioned. High Rom lists all the error codes. Well, have a look and see!

Potentially the Hex-dump can be very useful. Look for C9 (this is a return instruction) — the codes following this may well be the start of a useful sub-routine.

Within the bounds of a small article and one simple program, many points will go unmentioned — much will be oversimplified.

I hope to have given you a new slant to your machine without incurring too many 'tuts tuts' from those that know more, and those that know better!

```
e, 54, 49, 4e, 55, 45, 0, f5, c5, d5, e5, cd, 7e, bb
220 DATA 3e, c, cd, 5a, bb, 18, 1e, 5, 14, 7e, cd, 5a, bb, 23, 10, f9, 78, fe, 28,
28, f, 3e, d, cd, 5a, bb, 3e, a, cd, 5a, bb, 3e
230 DATA a, cd, 5a, bb, c9, 15, 2, cd, 7a, a6, 21, ba, a2, 6, 25, cd, 21, a4, 15, 3
, cd, 7a, a6, 21, de, a2, 6, 19, cd, 21, a4, 21
240 DATA b, a3, cd, 1f, a4, 16, 1, cd, 7a, a6, 21, f7, a2, cd, 1f, a4, 21, 1f, a3,
cd, 1f, a4, 21, 33, a3, cd, 1f, a4, 21, 47, a3, cd
250 DATA 1f, a4, 21, 81, a3, 6, 1e, cd, 21, a4, 21, 5b, a3, 6, 26, cd, 21, a4, 16,
2, cd, 7a, a6, 21, 9f, a3, 6, 28, cd, 21, a4, 16
260 DATA 1, cd, 7a, a6, e1, d1, c1, f1, c2, 3d, e5, cd, 0, b9, e, 0, 1e, 5, 21, 0, c
0, 3e, c, cd, 5a, bb, 79, fe, 0, 20, 17, 3e
270 DATA d, cd, 5a, bb, 3e, a, cd, 5a, bb, 16, 3, cd, 7a, a6, 3e, d, cd, 5a, bb, cd
, 17, a5, 3e, 20, cd, 5a, bb, cd, 1b, bb, fe, d
280 DATA 28, 63, 16, 2, cd, 7a, a6, 7e, cd, 20, a5, 16, 2, cd, 7a, a6, c, 23, 7b, f
e, 9, 28, 14, 7d, fe, ff, 20, 19, 7c, fe, ff, 28
290 DATA 3c, 7d, fe, ff, 20, f, 7c, fe, 3f, 28, 37, 7d, fe, ff, 20, 5, 7c, fe, bf,
28, 2d, 79, fe, 8, c2, b3, a4, e, 0, 18, 67, 7c
300 DATA cd, 20, a5, 7d, cd, 20, a5, c9, f5, f, f, f, f, cd, 29, a5, f1, e6, f, c6,
90, 27, ce, 40, 27, cd, 5a, bb, c9, 21, 0, c0
310 DATA 18, 3, 21, 0, 0, 3e, 7, cd, 5a, bb, cd, 18, bb, fe, 48, ca, a3, a4, fe, 45
, 28, 17, fe, d, 28, 89, fe, 4c, 28, 15, fe, 51
320 DATA ca, 11, a4, fe, 52, 28, 64, fe, 49, 28, 75, 18, d8, 16, 1, cd, 7a, a6, c9
, e, 0, 1e, 3, 21, 0, 0, cd, 5, b9, 3e, c, cd
330 DATA 5a, bb, c9, b2, a4, c9, 3e, 20, cd, 5a, bb, 3e, 20, cd, 5a, bb, 16, 1, cd
, 7a, a6, d5, 11, 8, 0, ed, 52, d1, e5, d5, c5, f5
340 DATA 7e, fe, 20, fa, a3, a5, fe, 7e, fa, a8, a5, 16, 3, cd, 7a, a6, cd, 5d, bb
, 16, 1, cd, 7a, a6, f1, c1, d1, e1, 23, c, 79, fe
350 DATA 8, 20, d9, e, 0, c3, b2, a4, c3, 11, a4, cd, 9, b9, cd, 0, b9, 3e, c, cd, 5
a, bb, 21, 0, 0, e, 0, 1e, 9, c3, b2, a4
360 DATA 3e, c, cd, 5a, bb, d5, c5, f5, e5, 3e, 2, cd, 90, bb, 21, c6, a3, 6, 16, c
d, 21, a4, 3e, d, cd, 5a, bb, 3e, a, cd, 5a, bb
370 DATA 21, db, a3, 6, 1e, cd, 21, a4, 3e, d, cd, 5a, bb, 3e, a, cd, 5a, bb, 21, f
9, a3, 6, 17, cd, 21, a4, e1, f1, c1, d1, 2e, 0
380 DATA 24, cd, 62, a6, 7c, ba, 20, 3, 61, e, 0, f5, e5, 21, 1, 16, cd, 75, bb, 3e
, 1, cd, 90, bb, 3e, 26, cd, 5a, bb, 21, 1, 17
390 DATA cd, 75, bb, e1, f1, cd, 17, a5, cd, 18, bb, fe, 43, 28, 6, fe, 49, 28, cd
, 18, f3, e, 0, f5, e5, d5, c5, cd, 3, bb, c1, d1
400 DATA e1, f1, 3e, c, cd, 5a, bb, c3, b2, a4, 7b, fe, 3, 20, 5, 16, 3f, e, 0, c9,
fe, 6, 20, 5, 16, ff, e, c0, c9, 16, bf, e
410 DATA 0, c9, f5, e5, 7a, cd, 90, bb, e1, f1, c9
```


[illegible]



Orders to:
Melbourne House Publishers
33 Milton Trading Estate
Abingdon, Oxon OX14 4TD

Correspondence to:
Castle Yard House
Castle Yard
Richmond TW10 6TF

All Melbourne House cassette software
is unconditionally guaranteed
against malfunction.

Trade enquiries welcome.

☐ Please send me your free catalogue.
Please send me:

COMMODORE 64

SOFTWARE

<input type="checkbox"/> Commodore 64 Zim Sala Bim	£9.95
<input type="checkbox"/> Commodore 64 Castle of Terror	£9.95
<input type="checkbox"/> Commodore 64 Sherlock	£14.95
<input type="checkbox"/> Commodore 64 Hampstead	£9.95
<input type="checkbox"/> Commodore 64 The Hobbit	£14.95
<input type="checkbox"/> Commodore 64 Classic Adventure	£6.95
<input type="checkbox"/> Commodore 64 Hungry Horace	£5.95
<input type="checkbox"/> Commodore 64 Horace Goes Skiing	£5.95
<input type="checkbox"/> Commodore 64 FORTH	£14.95
<input type="checkbox"/> Commodore 64 A.C.D.S. +	£8.95
<input type="checkbox"/> Commodore 64 Penetrator	£7.95

BOOKS

<input type="checkbox"/> Commodore 64 Games Book 2	£6.95
<input type="checkbox"/> Supercharge Your Commodore 64	£5.95
<input type="checkbox"/> Commodore 64 Software Projects	£6.95
<input type="checkbox"/> Commodore 64 Games Book	£5.95
<input type="checkbox"/> Commodore 64 Sound & Graphics	£5.95
<input type="checkbox"/> Commodore 64 Exposed	£6.95
<input type="checkbox"/> Commodore 64 Machine Language for the Absolute Beginner	£6.95

£.....

Please add 80p for post & pack

£.....80

TOTAL

£.....

enclose my ☐ cheque

☐ money order for

£.....

Please debit my Access card No

Expiry Date

Signature

Name

Address

Postcode

POP1/128

Access orders can be
telephoned through on our
24-hour ansafone (0235) 83 5001.



Zim Sala Bim — a totally new adventure experience!

This program has it all:

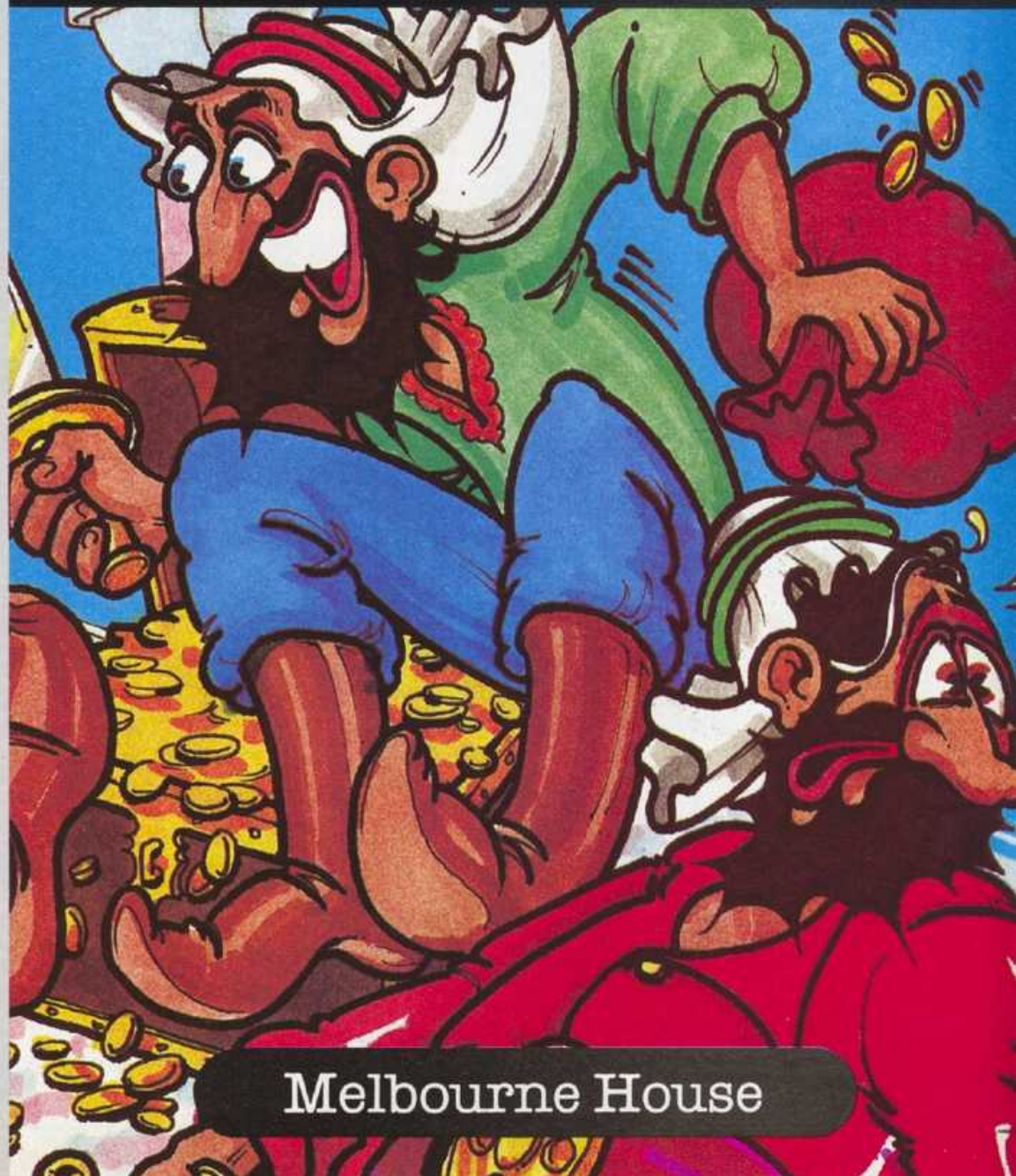
- * Smooth, arcade-style graphics.
- * Every location brilliantly displayed in 3-dimensional graphics.
- * Murder, mystery and adventure in the malicious Sultan's kingdom.
- * Exciting challenging problems full of variety and intrigue.

Zim Sala Bim brings to the Commodore 64 a new thrilling experience.

'The graphics on this are amazing.'
— Personal Computer News

'Clever use of some excellent music.'
— Personal Computer Games

ZIM SALA BIM



Melbourne House

REALTIME SOFTWARE

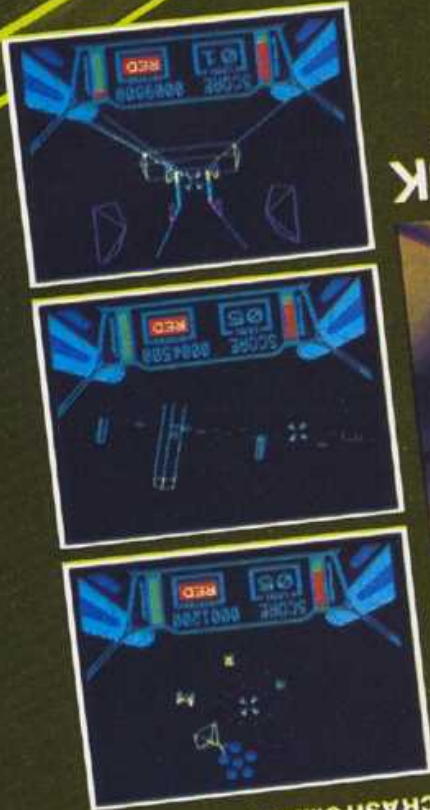
£5.95

STARSTRIKE

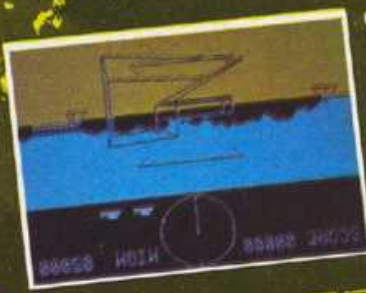
ZX SPECTRUM 48K
SINCLAIR, KEMPSTON AND CURSOR
JOYSTICK COMPATIBLE



The battalion to end them all!
Blast the aliens, invade
the battleplanet and destroy it!
The mean and deadly
CRASH SMASH - 93%.



3-D TANK DUEL



£5.50

You against
enemy tanks, UFOs
and missiles -
A killer of a game!
CRASH Rating 83%.

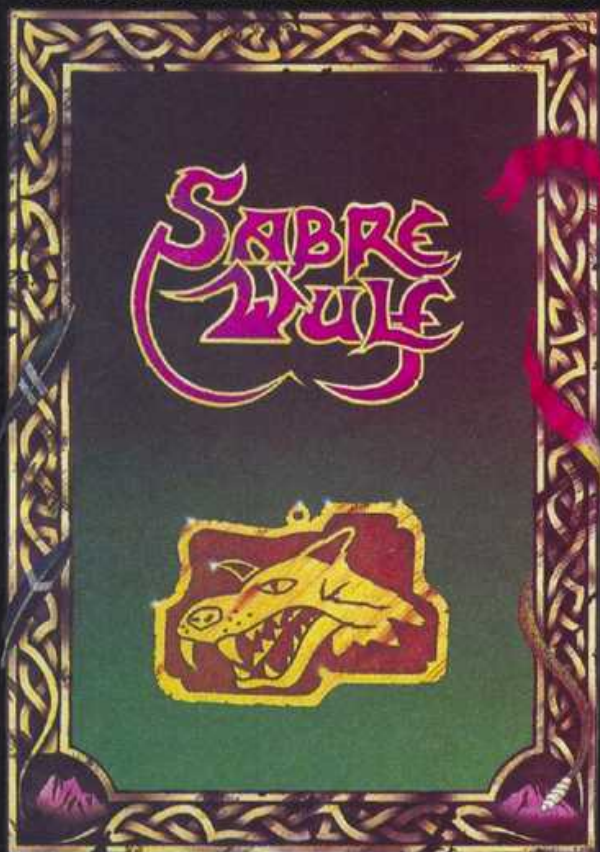
REALTIME SOFTWARE, PROSPECT HOUSE, 32 SOVEREIGN STREET,
LEEDS LS1 4BU
Name _____
Address _____
Postcode _____
Cheques/p.o. payable to REALTIME SOFTWARE
BOTH GAMES FOR ONLY £10 ☐ PAPER ☐ TANK DUEL £5.50 ☐ PAPER ☐ TANK DUEL £5.95 ☐ PAPER ☐ TANK DUEL £5.95 ☐ PAPER ☐ TANK DUEL £5.95

48K SINCLAIR ZX SPECTRUM

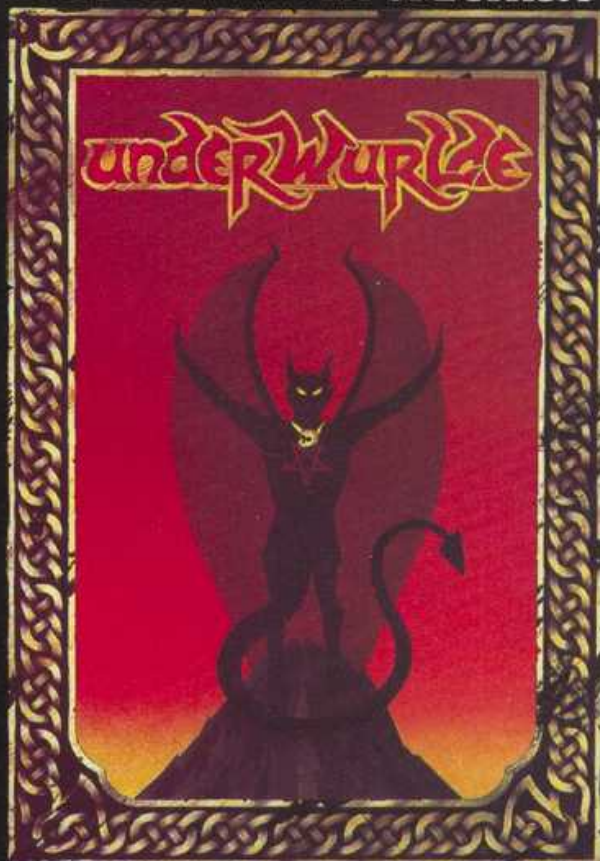


BBC MODEL B 1.2 OS

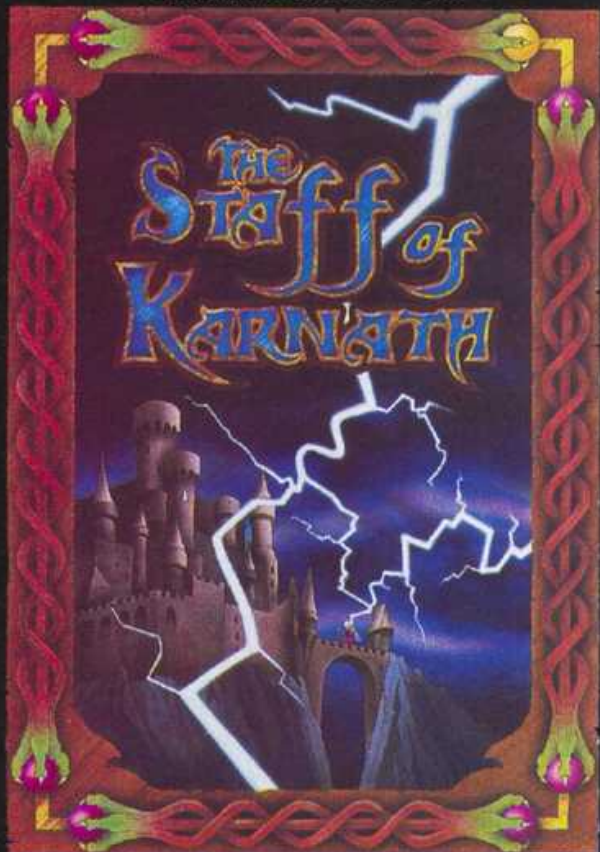
48K SINCLAIR ZX SPECTRUM



48K SINCLAIR ZX SPECTRUM



COMMODORE 64



"KNIGHTLORE", "UNDERWULDE", "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

BACKPACKERS

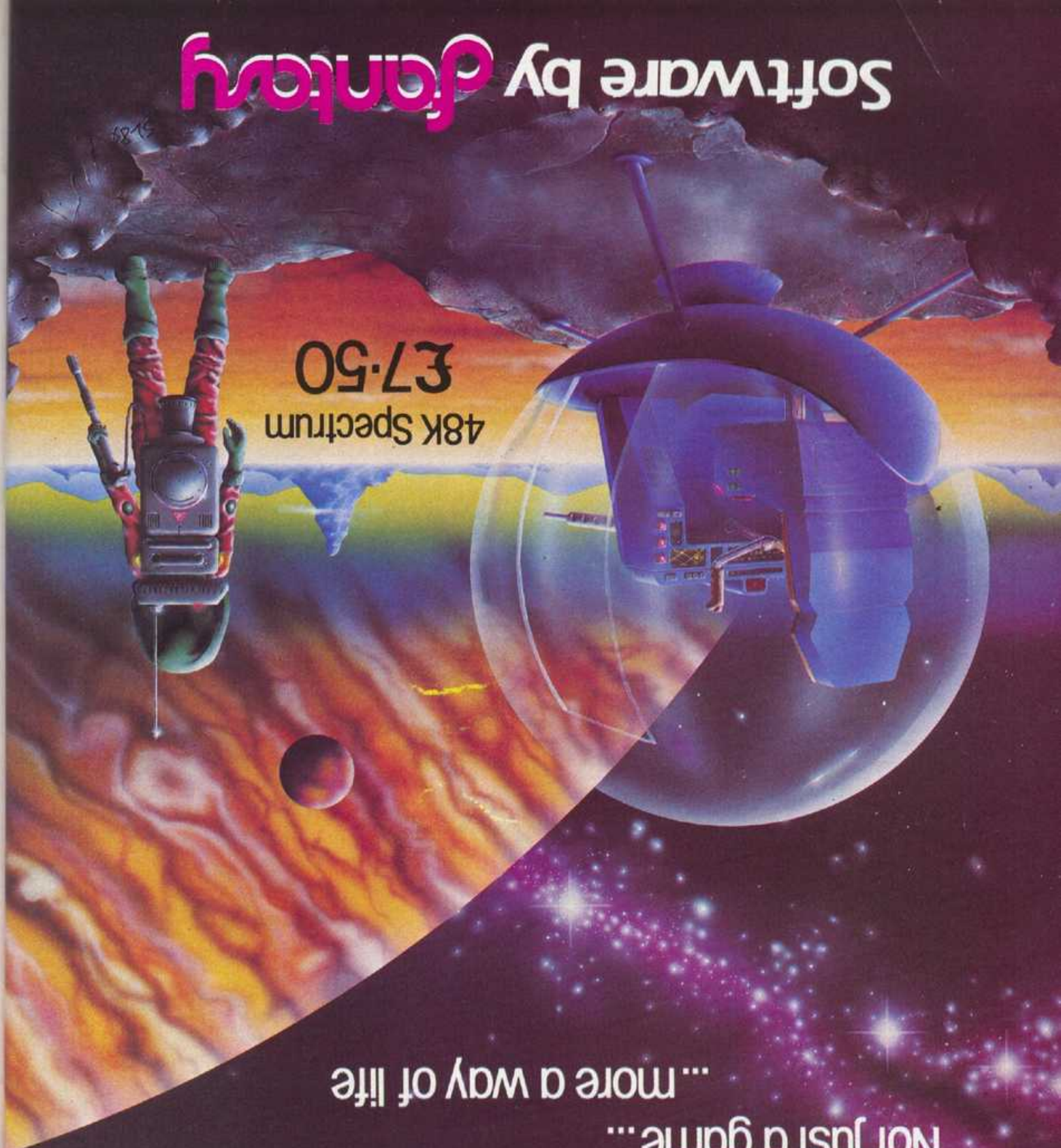
GUIDE TO THE UNIVERSE PART 1

Not just a game...

...more a way of life

48k Spectrum
£7.50

Software by **fantasy**



A53D	3E07	1690	HOLDUP	LD	A, #07	A5FB	061E	2570	LD	B, 30
A53F	CD5AB8	1690	CALL	OPUT		A5FD	CD21A4	2580	CALL	HEXCH
A542	CD10BB	1700	CALL	KYWAIT		A500	3E0D	2590	LD	A, #0D
A545	FE4B	1710	CP	#4B		A502	CD5AB8	2600	CALL	OPUT
A547	CAA3A4	1720	JP	Z, BEGIN		A505	3E0A	2610	LD	A, #0A
A54A	FE45	1730	CP	#45		A507	CD5AB8	2620	CALL	OPUT
A54C	2B17	1740	JR	Z, NOMORE		A50A	21F9A3	2630	LD	HL, TEXT15
A54E	FE0D	1750	CP	#0D		A50D	0617	2640	LD	B, 22
A550	2B8B	1760	JR	Z, CONT		A50F	CD21A4	2650	CALL	HEXCH
A552	FE4C	1770	CP	#4C		A512	E1	2660	POP	HL
A554	2B15	1780	JR	Z, LOROM		A513	F1	2670	POP	AF
A556	FE51	1790	CP	#51		A514	C1	2680	POP	BC
A558	CA11A4	1800	JP	Z, TOPS		A515	D1	2690	POP	DE
A55B	FE52	1810	CP	#52		A516	3E00	2700	LD	L, 0
A55D	2B64	1820	JR	Z, ALLRAM		A518	2A	2710	ANDT	INC H
A55F	FE49	1830	CP	*1*		A519	CD62A6	2720	CALL	ENSTOP
A561	2B75	1840	JR	Z, UPABIT		A51C	7C	2730	LD	A, H
A563	1BDB	1850	JR	HOLDUP		A51D	8A	2740	CP	D
A565	1601	1860	LD	D, #01		A51E	2003	2750	JR	NZ, OKAY
A567	CD7AA6	1870	CALL	COLOUR		A520	61	2760	LD	H, C
A56A	C9	1880	RET			A521	0E00	2770	LD	C, #00
A56B	0E00	1890	LOROM	LD	C, #00	A523	F5	2780	OKAY	PUSH AF
A56D	1E03	1900		LD	E, #03	A524	E5	2790	PUSH	HL
A56F	210000	1910		LD	HL, #0000	A525	210116	2800	LD	HL, #1601
A572	CD06B9	1920	CALL	ONLORO		A528	CD75BB	2810	CALL	SETCUR
A575	3E0C	1930	LD	A, #0C		A52B	3E01	2820	LD	A, #01
A577	CD5AB8	1940	CALL	OPUT		A52D	CD90BB	2830	CALL	SETPEN
A57A	C3B2A4	1950	JP	ISIT		A530	3E26	2840	LD	A, *3*
A57D	C9	1960	RET			A532	CD5AB8	2850	CALL	OPUT
A57E	3E20	1970	CHARS	LD	A, #20	A535	210117	2860	LD	HL, #1701
A580	CD5AB8	1980	CALL	OPUT		A538	CD75BB	2870	CALL	SETCUR
A583	3E20	1990	LD	A, #20		A53B	E1	2880	POP	HL
A585	CD5AB8	2000	CALL	OPUT		A53C	F1	2890	POP	AF
A588	1601	2010	LD	D, #01		A53D	CD17A5	2900	CALL	FOURB
A58A	CD7AA6	2020	CALL	COLOUR		A540	CD10BB	2910	CALL	KYWAIT
A58D	D5	2030	PUSH	DE		A543	FE43	2920	CP	*C*
A58E	110800	2040	LD	DE, #0000		A545	2B06	2930	JR	Z, SOFTY
A591	ED52	2050	SBC	HL, DE		A547	FE49	2940	CP	*1*
A593	D1	2060	POP	DE		A549	2B0D	2950	JR	Z, ANDT
A594	E5	2070	PUSH	HL		A54B	1BF3	2960	JR	TESTIT
A595	D5	2080	PUSH	DE		A54D	0E00	2970	SOFTY	LD
A596	C5	2090	PUSH	BC		A54F	F5	2980	START	PUSH AF
A597	F5	2100	PUSH	AF		A550	E5	2990		PUSH HL
A598	7E	2110	LD	A, (HL)		A551	D5	3000		PUSH DE
A599	FE20	2120	CP	#20		A552	C5	3010		PUSH BC
A59B	FAA3A5	2130	JP	M, COLCH		A553	CD03BB	3020		CALL #BB03
A59E	FE7E	2140	CP	#7E		A556	C1	3030		POP BC
A5A0	FAA8A5	2150	JP	M, TEXCH		A557	D1	3040		POP DE
A5A3	1603	2160	LD	D, #03		A558	E1	3050		POP HL
A5A5	CD7AA6	2170	CALL	COLOUR		A559	F1	3060		POP AF
A5A8	CD5DBB	2180	CALL	#BB5D		A55A	3E0C	3070		LD A, #0C
A5AB	1601	2190	LD	D, #01		A55C	CD5AB8	3080		CALL OPUT
A5AD	CD7AA6	2200	CALL	COLOUR		A55F	C3B2A4	3090		JP
A5B0	F1	2210	POP	AF		A562	7B	3100	ENSTOP	LD
A5B1	C1	2220	POP	BC		A563	FE03	3110		CP
A5B2	D1	2230	POP	DE		A565	2005	3120		JR
A5B3	E1	2240	POP	HL		A567	163F	3130		LD
A5B4	23	2250	INC	HL		A569	0E00	3140		LD
A5B5	0C	2260	INC	C		A56B	C9	3150		RET
A5B6	79	2270	LD	A, C		A56C	FE06	3160	ENSE	CP
A5B7	FE08	2280	CP	#8		A56E	2005	3170		JR
A5B9	2009	2290	JR	NZ, INCH		A570	16FF	3180		LD
A5BB	0E00	2300	LD	C, #00		A572	0E00	3190		LD
A5BD	C3B2A4	2310	JP	ISIT		A574	C9	3200		RET
A5C0	C311A4	2320	FINIT	JP	TOPS	A575	16FF	3210	ENSE	LD
A5C3	CD09B9	2330	ALLRAM	CALL	OFLORO	A577	0E00	3220		LD
A5C6	CD09B9	2340	CALL	ONUPRO		A579	C9	3230		RET
A5C9	3E0C	2350	LD	A, #0C		A57A	F5	3240	COLOUR	PUSH AF
A5CB	CD5AB8	2360	CALL	OPUT		A57B	F5	3250		PUSH HL
A5CE	210000	2370	LD	HL, #0000		A57C	7A	3260		LD
A5D1	0E00	2380	LD	C, #00		A57D	CD90BB	3270		CALL
A5D3	1E09	2390	LD	E, 9		A580	E1	3280		POP
A5D5	C3B2A4	2400	JP	ISIT		A581	F1	3290		POP
A5D8	3E0C	2410	UPABIT	LD	A, #0C	A582	C9	3300		RET
A5DA	CD5AB8	2420	CALL	OPUT		ALLRAM	A5C3	ANDT	A618	ADUT
A5DD	D5	2430	PUSH	DE		BEGIN	A1A3	BITS	A529	CHARS
A5DE	C5	2440	PUSH	BC		COLOUR	A67A	CONT	A1DA	ENSE
A5DF	F5	2450	PUSH	AF		ENSTOP	A662	FINIT	A5C9	FOURB
A5E0	E5	2460	PUSH	HL		HERE	A497	HOLDHI	A535	HOLDLO
A5E1	3E02	2470	LD	A, #02		INCH	A594	ISIT	A1B2	ISRAM
A5E3	CD90BB	2480	CALL	SETPEN		KYWAIT	BB10	LOROM	A56B	MISS
A5E6	2105A3	2490	LD	HL, TEXT13		NOMORE	A555	NOW	A42D	OFLORO
A5E9	0615	2500	LD	B, 22		OKAY	A623	ONLORO	B906	ONUPRO
A5EB	CD21A4	2510	CALL	HEXCH		SETCUR	BB75	SETPEN	BB90	SKIP
A5EE	3E0C	2520	LD	A, #0C		START	A64F	TESTIT	A540	TEYCH
A5F0	CD5AB8	2530	CALL	OPUT		TEXT11	A39F	TEXT12	A3B1	TEXT13
A5F3	3E0A	2540	LD	A, #0A		TEXT15	A3F9	TEXT3	A2DE	TEXT4
A5F5	CD5AB8	2550	CALL	OPUT		TEXT16	A31F	TEXT7	A333	TEXT8
A5F8	21DBA3	2560	LD	HL, TEXT14		TOPS	A411	UPABIT	A5DB	

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 like to see, please write to: Tony Kendle, Arcade Avenue, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

Tony Kendle

of in future Avenues, Paul we will be hearing a lot more level. I'm sure that it is a game nish it even at the very easiest movement and have yet to find still astounded at the speed of turn. After weeks of play I am best of its kind for the Spec-Design-Design. "It is surely the plug for Dark Star from Paul also wants to put in a address).

Paul Rhodes of Luton has written to tell me that the price of his Jet-Set Editor I mentioned some weeks ago is in fact £4 (see PCW 27th Sept for the

her? Software's new program Back completed test 5 of Incentive 25th October I successfully

Ford. "At 3am on Thursday from Guy Hedley of Chandlers completely unfamiliar with about a game that I am Now then, here's a letter me it still won't be easy.

Many, many thanks for that the moon and bring it back... must be on). Then get the magnet to get the alarm key on get the key (the HELP feature and the book you can get the get the book. With the ticket Then get the library ticket to banister to get the helmet. ignition keys to slide down the the driving licence to get the the next paragraph NOW! "Get want to know how to do it go to — so those of you who don't give some tips for Pyramagames Andrew then goes on to Melbourne House."

and Terror Daktil 4D from gate, Centipede by C-Tech from are Quicksilver's Time-favourite Spectrum game of all time. Games to keep away Wally. I think this must be my work. Now look out for Life of life Wally will be early for

ken up. For the first time in his "Congratulations. Wally's wo- display and then the message while, there is a short firework alarm key the clock rings for a rama. When you insert the gent's fantastic game Pyrama- writes: "I have finished Mikro- Andrew Dudman of Clossop fall to its death."

the end and the zombie will Bottles. You can then walk off follow you along to the musical on foot to your wall and he will him. You then lead the zombie magenta and you can control him on the back so he turns directly behind him and touch are in the copier you can land close to the others. Then if you pick one out that is not too Then find the zombies and steps at one end to climb up, more points. Don't forget to put possibly can as this gives you blocks high and as long as you of the walls. Make the wall 3 your helicopter to build up one zombies you must first use these tips. "In order to kill the a date. He/she also sends 1233 points, but does not give

who has also finished, with from W E Cowling of Rednith same postbag arrived a letter actually the first because in the sound." It's difficult to say who was what sounds like two channels March of the Foreadors in accompanied by a burst of we'll get you...next time' ac- ten us this time human. But message appears "You've been after killing 14 zombies. The pm on Saturday 6th October Ant Attack. "I finished at 1.45 the first to finish Zombie Zom- Hayes comes the claim to be 'first'. From S Ryatt of this week to a couple of congratulations go out

Pyramagames



Arcade Avenue

Screen Fill

1 REM **SCREEN FILL**
5 POKES6,28:CLR
20 FORS=7168T07241:READN:POKES,N: NEXT S
100 DATA169,0,133,87,169,30,133,88,165,87,133,89,165,88,105,120,133,90,169,0,133
110 DATA91,169,0,133,92,162,23,160,22,136,165,91,145,87,165,92,145,89,136
120 DATA208,245,145,89,165,91,145,87,24,165,87,105,22,133,87,144,2,230,88
130 DATA24,165,89,105,22,133,89,144,2,230,90,202,208,211,96
1000 REM 716987173 - TWO BYTE LOCATION OF TOP LEFT CORNER OF SCREEN TO FILL
1010 REM 7187 - CHARACTER 7191 - COLOUR 7195 - NO.ROWS 7197 - NO.COLUMNS

Screen Fill

on Vic 20

This short machine code routine will work

on the unexpanded Vic 20. It allows the user to fill in any window on the screen in any character and in any colour. The locations which hold the values of the window, character and colour are shown in routine is called by Sys 7168.

The routine can also be used as a partial the whole screen with character φ in black.

the listing which, at present, is set up to fill screen clear by using Character 32. The

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.

Open Forum

IF YOU WANT THE BEST THIS CHRISTMAS

THEN LET US SUPPLY YOU WITH A **SPECTRUM 48K**
FITTED WITH A **SAGA 1 EMPEROR KEYBOARD**

£177.50



FULL WARRANTY
FREE '6' PACK SOFTWARE INCL.
SUPERB PROFESSIONAL QUALITY AT YOUR FINGERTIPS

- DUST COVER £4.95
- CARRY CASE £26.95
- EXTENDED CABLE £9.50

PLEASE SEND ME

- ☐ Spectrum 48K with SAG 1 Emperor keyboard fitted.
- ☐ Dust cover ☐ Carry case
- ☐ Extender cable ☐ Sound booster.

I enclose cheque/P.O. for

ZEAL MARKETING LIMITED

Vanguard Trading Estate,
Storforth Lane,
Chesterfield S40 2TZ. Tel: 0246 208555

**LET OUT THOSE SOUNDS WITH A
ZEAL SOUND BOOSTER FOR SPECTRUM**

£14.50



JUST PLUG IN ALL
CONNECTIONS
EXTERNAL
FULL VOLUME
CONTROL
LOAD/SAVE
SWITCH

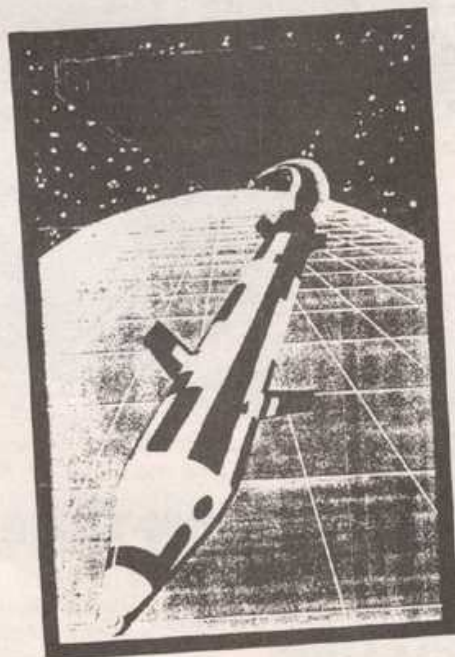
ALL PRICES INCLUDE VAT/CARRIAGE.

New for the SPECTRUM 48K

SUPERPOWER

THE FINAL STRATEGY

NEW



**SINCLAIR ZX
SPECTRUM 48K**

SUPERPOWER is a powerful strategic War Game for two Players. The winner is the Superpower who manages to conquer all 28 countries on the map.

It's a game where you make the decisions that count — Do you immediately attack your opponents' countries? or wait to reinforce your armies? — Do you build more factories to support those armies? or take the risk of launching a missile? —

The decisions are yours when you play
SUPERPOWER — The Final Strategy.

SUPERPOWER is only available by mail order at the present time but trade enquiries most welcome.

Please supply me with a copy of 'SUPERPOWER'
I enclose a Cheque/PO for £5.50.

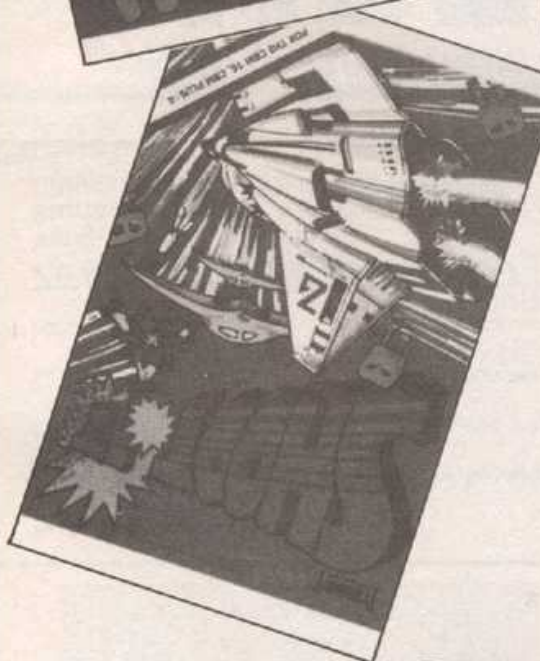
NAME

ADDRESS

Post Code

Send to: HOWARD MARKETING, PO Box 21,
Felixstowe, Suffolk IP11 7LJ.

COMMODORE C-16 AND PLUS 4 SOFTWARE STARTER PACK



- ★ CLIMB-IT
- ★ HOP-IT
- ★ SHOOT-IT
- ★ MUNCH-IT

£14.95

AVAILABLE NOW FROM LEADING
COMPUTER STORES OR DIRECT FROM
Tynesoft for £14.95
INCLUDING POSTAGE & PACKING.

Tynesoft
COMPUTER SOFTWARE

ADDISON INDUSTRIAL ESTATE, BLAYDON-ON-TYNE,
TYNE & WEAR. TEL: (091) 414 4611.
DEALER ENQUIRIES WELCOME
OTHER EXCITING TITLES AVAILABLE SOON

Row of Four

on Commodore 64

This is a two-player game for the CBM 64, which is quite good fun to play. The listing

```

5 REM *****
6 REM * FOUR-IN-A-ROW *
7 REM * BY *
8 REM * 1984 *
9 REM *
10 REM* NEIL GREENWOOD*
11 REM*****
12 REM* 1984 *
13 REM*****
14 PRINT "RE: REM CLR
15 FOR I=1 TO 15
20 I=INT(RND(1)*15)+1
22 FOR A=1 TO 10
25 POKE53280,I:POKE53281,I
30 NEXT A,I
35 POKE53281,4:POKE53280,9
40 FOR Q=1024 TO 2023: T=INT(RND(1)*126)+1:P
OKEQ,T:NEXT
45 FOR Y=55296 TO 56295: O=INT(RND(1)*14)+1:
POKEY,O:NEXT
46 PRINT "*****FOUR IN
A ROW": REM BLACK
47 PRINT "*****QB BY NEIL L. GREENWOOD
50 PRINT "*****HIT A KEY!": RE
M BLACK
60 GET A$: IF A$="" THEN GOTO
90 LET S=0
95 LET C=0
100 PRINT "*****FOUR-IN-A-ROW": R
EM GREEN & HOME
200 PRINT "*****": RE
M ORANGE
250 PRINT "EQ THE OBJECT OF THIS GAME IS
TO GET FOUR": REM WHITE

```

was done on a Commodore 1520 Printer-Plotter which does not print Graphics characters, so when typing in, you should pay attention to the Rem statements.

Program notes

14-60 Random Display

100-550 Title page
600-1130 Input names of players
1200-1340 Game Screen
1350-2000 Checks key pressed
2100-2840 Prints a score table
2900-2840 Another game
2900-3000 routine

```

300 PRINT "OF YOUR COUNTERS IN A ROW."
310 PRINT "TYPE IN YOUR NAME( NO LONGER TH
AN 19 LETTERS)"
350 PRINT "IF FIRSTLY YOU TYPE IN YOUR PLA
YER NUMBER:"
400 PRINT "AND THEN THE POSITION YOU WANT
YOUR"
450 PRINT "COUNTER."
455 PRINT "PRESS SPACE WHEN THE GAME IS
OVER"
460 PRINT "YOU WILL THEN BE ASKED WHO WON
,TYPE"
465 PRINT "IN THE WINNERS NAME, IF THE GAM
E WAS "
470 PRINT "DRAWN TYPE IN ERDRAWL": REM WH
ITE, RUS ON & OFF
475 PRINT "Q 10 POINT'S FOR A WIN."
480 PRINT "Q 5 POINT'S FOR A DRAWN GAME
"
485 FOR I=1065 TO 1902: POKE I,86: FOR Z=1 TO 10:
NEXT Z,I
490 FOR P=56137 TO 56175: X=INT(RND(1)*14)+1
:POKE P,X:NEXT
500 PRINT "*****HIT A KEY.": R
EM YELLOW
550 GET B$: IF B$="" THEN 550
600 PRINT "*****POKE53281,7:POKE53280,6: PRI
NT "
650 PRINT "*****FOUR-IN-A-ROW"
660 PRINT "*****"
670 PRINT "QB INPUT PLAYER ONE'S NAME.":
REM ORANGE
680 INPUT "Q": P0$
685 IF LEN(P0$)>19 THEN 650
690 PRINT "QB INPUT PLAYER TWO'S NAME.":
REM BROWN

```

```

700 INPUT "Q": PT$
710 IF LEN(PT$)>19 THEN 650
750 FOR I=1 TO 1000: NEXT I
800 PRINT "*****POKE53281,6:POKE53280,5: PRI
NT "
850 PRINT "*****FOUR-IN-A-ROW"
900 PRINT "*****"
950 PRINT "QB *****: P0$
1000 PRINT "QB *****
R L"
1010 PRINT "*****R L R L
1020 PRINT "*****R L R L
1030 PRINT "*****R L R L
1040 PRINT "*****R L R L
1050 PRINT "*****R L R L
1060 PRINT "*****R L R L
1070 PRINT "*****R L R L
1080 PRINT "*****R L R L
1090 PRINT "*****R L R L
1100 PRINT "*****R L R L
1110 PRINT "*****R L R L
1120 PRINT "QB *****: PT$: REM MED
GREY
1130 FOR I=1 TO 2000: NEXT I
1200 PRINT "*****POKE53288,5:POKE53281,5: PRI
NT "
1220 PRINT "*****FOUR-IN-A-ROW"
1230 PRINT "*****"
1233 PRINT "QB"
1235 FOR I=1 TO 5
1237 REM (SHIFT+O,CBM KEY+T,SHIFT+P) NIN

```

Microradio

GW6JJN



Autostart

This weeks mailbag includes a bumper bundle from Michael Farrington of 3 Julia Crescent, Stonebroom, Derbyshire; bringing very good news indeed for readers with the Sharp MZ700 micro. I am often asked about radio software for this machine and so far, there has been very little. Now that situation has changed. Mr Farrington has put together a suite of programs including an interface for radio comms on the Sharp MZ700. It includes RTTY and the driving software for a 300 baud modem.

Firstly, the RTTY program. It is written entirely in machine

code and offers the following features. It can operate at 45.5, 50, 75 and 110 baud which covers most amateur and commercial applications. Split screen mode operates with seven memories, each with one thousand characters making it simple to prepare messages saving air time for slower typists.

As is the norm nowadays with such software, a real time clock is available on screen and for transmission of the time of message. The author points out that only a fairly simple terminal unit is required on the Sharp and this can be home-made or provided with the program. The tone frequencies are extremely accurate and the facility to store call, signs, etc to be sent automatically is present within the software.

Any page that appears on screen, messages, the instructions, menus, memories etc can be dumped to the printer for a permanent record. One aspect of this program that ap-

pealed to me was the Clock function which can be called, when the micro is not actually being used as a terminal to send or receive RTTY, in order to use the screen to display the time as a general purpose digital clock. This function will display the time in 24 hour format in two inch high, seven segment figures.

The nicest touch of all, in my opinion, and something that I've not seen before in such a program is the autostart feature. This is just what is needed for the amateur and it works like this. Once shift/A is pressed, the micro can be left to listen or monitor a particular frequency. On the Amateur bands as well as others, there may be noise, speech or whatever between messages. Most programs interpret this as jumbled characters on the screen. Not so this program. On Autostart, the software listens and can detect only valid RTTY signals and will decode them. All noise, speech, etc is ignored.

Also from Mr Farrington is a terminal emulation program for the Sharp MZ700. The same terminal interface is used as for the RTTY. The terminal program allows for 300 baud semi-duplex and can call, answer or self test the terminal unit. Details of a home constructed acoustic coupler can be had along with the unit.

Michael Farrington's programs at £10 for the RTTY and £8 for the terminal emulation will provide a splendid opportunity for Sharp owners to get on the air. As it is among the best software of its kind that I have seen, all credit must go Michael and we look forward to the AMTOR programs he promises for the future.

Ray Berry

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.

doing it. get but for the challenge of not for the information they can enjoy breaking into a system — the people who hackers — the people who bad news by most 'traditional' It's probably also seen as various database operators.

along the corridors of BT and cries of outrage ring out hddes once again and hacking has hit the hea-

Breaking in



I don't wish to condone hacking but there is a difference between the new teeny-hackers who got into Prestel and the old style traditionalists. The former are likely to sub-

stantially reduce the facilities available on databases as operators, shocked by the damage done, tighten up.

There was nothing particularly clever about this latest hacking of Prestel. As I understand it, it was more to do with the system management than cracking a mysterious code. Similarly the episode when Telecom Gold was hacked on a live TV show probably had more to do with users not guarding their account num-

bers (the equivalent of your cheque card signature) sufficiently, leave it at that, inform the organisation of the security.

It's not really this type of hacking that concerns most people on a serious level — wire tapping of data lines has more far-reaching implications. My message to hackers is if you must try to break in and prove yourself against the se-

curity, leave it at that, inform the organisation of the security.

As long as good database housekeeping is maintained systems like these are fairly secure. What the hackers do is attempt to log-on using sequential numbering and alpha-numeric patterns until they strike lucky. Some also try sequential telephone dialing in particular patterns until they hit an ex-

gap and don't mess about with the system to cause embarrassing consequences will be much less flexible databases. N.B. If you are using a database with account numbers and log-on passwords change them every week. And select odd combinations of letters and numbers.

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 019983727.

Baud Walk

Row of Four by N Greenwood

```
1530 IF#5=-C THENP0KE1384+16,X:P0KE55656
1520 IF#5=-B THENP0KE1384+13,X:P0KE55656
1510 IF#5=-A THENP0KE1384+10,X:P0KE55656
1500 IF#5=0 THENP0KE1384+7,X:P0KE55656
1490 IF#5=-9 THENP0KE1264+31,X:P0KE55336
1480 IF#5=-8 THENP0KE1264+28,X:P0KE55336
1470 IF#5=-7 THENP0KE1264+25,X:P0KE55336
1460 IF#5=-6 THENP0KE1264+22,X:P0KE55336
1450 IF#5=-5 THENP0KE1264+19,X:P0KE55336
1440 IF#5=-4 THENP0KE1264+16,X:P0KE55336
1430 IF#5=-3 THENP0KE1264+13,X:P0KE55336
1420 IF#5=-2 THENP0KE1264+10,X:P0KE55336
1410 IF#5=-1 THENP0KE1264+7,X:P0KE55336
1400 GET#4:IF#4=-1 THENP0KE1400
1390 GET#4:IF#4=-2 THENP0KE1400
1380 GET#4:IF#4=-3 THENP0KE1400
1370 GET#4:IF#4=-4 THENP0KE1400
1360 GET#4:IF#4=-5 THENP0KE1400
1350 GET#4:IF#4=-6 THENP0KE1400
1340 GET#4:IF#4=-7 THENP0KE1400
1330 GET#4:IF#4=-8 THENP0KE1400
1320 GET#4:IF#4=-9 THENP0KE1400
1310 GET#4:IF#4=-0 THENP0KE1400
1300 GET#4:IF#4=-1 THENP0KE1400
1290 GET#4:IF#4=-2 THENP0KE1400
1280 GET#4:IF#4=-3 THENP0KE1400
1270 GET#4:IF#4=-4 THENP0KE1400
1260 GET#4:IF#4=-5 THENP0KE1400
1250 GET#4:IF#4=-6 THENP0KE1400
1240 GET#4:IF#4=-7 THENP0KE1400
1230 GET#4:IF#4=-8 THENP0KE1400
1220 GET#4:IF#4=-9 THENP0KE1400
1210 GET#4:IF#4=-0 THENP0KE1400
1200 GET#4:IF#4=-1 THENP0KE1400
1190 GET#4:IF#4=-2 THENP0KE1400
1180 GET#4:IF#4=-3 THENP0KE1400
1170 GET#4:IF#4=-4 THENP0KE1400
1160 GET#4:IF#4=-5 THENP0KE1400
1150 GET#4:IF#4=-6 THENP0KE1400
1140 GET#4:IF#4=-7 THENP0KE1400
1130 GET#4:IF#4=-8 THENP0KE1400
1120 GET#4:IF#4=-9 THENP0KE1400
1110 GET#4:IF#4=-0 THENP0KE1400
1100 GET#4:IF#4=-1 THENP0KE1400
1090 GET#4:IF#4=-2 THENP0KE1400
1080 GET#4:IF#4=-3 THENP0KE1400
1070 GET#4:IF#4=-4 THENP0KE1400
1060 GET#4:IF#4=-5 THENP0KE1400
1050 GET#4:IF#4=-6 THENP0KE1400
1040 GET#4:IF#4=-7 THENP0KE1400
1030 GET#4:IF#4=-8 THENP0KE1400
1020 GET#4:IF#4=-9 THENP0KE1400
1010 GET#4:IF#4=-0 THENP0KE1400
1000 GET#4:IF#4=-1 THENP0KE1400
990 GET#4:IF#4=-2 THENP0KE1400
980 GET#4:IF#4=-3 THENP0KE1400
970 GET#4:IF#4=-4 THENP0KE1400
960 GET#4:IF#4=-5 THENP0KE1400
950 GET#4:IF#4=-6 THENP0KE1400
940 GET#4:IF#4=-7 THENP0KE1400
930 GET#4:IF#4=-8 THENP0KE1400
920 GET#4:IF#4=-9 THENP0KE1400
910 GET#4:IF#4=-0 THENP0KE1400
900 GET#4:IF#4=-1 THENP0KE1400
890 GET#4:IF#4=-2 THENP0KE1400
880 GET#4:IF#4=-3 THENP0KE1400
870 GET#4:IF#4=-4 THENP0KE1400
860 GET#4:IF#4=-5 THENP0KE1400
850 GET#4:IF#4=-6 THENP0KE1400
840 GET#4:IF#4=-7 THENP0KE1400
830 GET#4:IF#4=-8 THENP0KE1400
820 GET#4:IF#4=-9 THENP0KE1400
810 GET#4:IF#4=-0 THENP0KE1400
800 GET#4:IF#4=-1 THENP0KE1400
790 GET#4:IF#4=-2 THENP0KE1400
780 GET#4:IF#4=-3 THENP0KE1400
770 GET#4:IF#4=-4 THENP0KE1400
760 GET#4:IF#4=-5 THENP0KE1400
750 GET#4:IF#4=-6 THENP0KE1400
740 GET#4:IF#4=-7 THENP0KE1400
730 GET#4:IF#4=-8 THENP0KE1400
720 GET#4:IF#4=-9 THENP0KE1400
710 GET#4:IF#4=-0 THENP0KE1400
700 GET#4:IF#4=-1 THENP0KE1400
690 GET#4:IF#4=-2 THENP0KE1400
680 GET#4:IF#4=-3 THENP0KE1400
670 GET#4:IF#4=-4 THENP0KE1400
660 GET#4:IF#4=-5 THENP0KE1400
650 GET#4:IF#4=-6 THENP0KE1400
640 GET#4:IF#4=-7 THENP0KE1400
630 GET#4:IF#4=-8 THENP0KE1400
620 GET#4:IF#4=-9 THENP0KE1400
610 GET#4:IF#4=-0 THENP0KE1400
600 GET#4:IF#4=-1 THENP0KE1400
590 GET#4:IF#4=-2 THENP0KE1400
580 GET#4:IF#4=-3 THENP0KE1400
570 GET#4:IF#4=-4 THENP0KE1400
560 GET#4:IF#4=-5 THENP0KE1400
550 GET#4:IF#4=-6 THENP0KE1400
540 GET#4:IF#4=-7 THENP0KE1400
530 GET#4:IF#4=-8 THENP0KE1400
520 GET#4:IF#4=-9 THENP0KE1400
510 GET#4:IF#4=-0 THENP0KE1400
500 GET#4:IF#4=-1 THENP0KE1400
490 GET#4:IF#4=-2 THENP0KE1400
480 GET#4:IF#4=-3 THENP0KE1400
470 GET#4:IF#4=-4 THENP0KE1400
460 GET#4:IF#4=-5 THENP0KE1400
450 GET#4:IF#4=-6 THENP0KE1400
440 GET#4:IF#4=-7 THENP0KE1400
430 GET#4:IF#4=-8 THENP0KE1400
420 GET#4:IF#4=-9 THENP0KE1400
410 GET#4:IF#4=-0 THENP0KE1400
400 GET#4:IF#4=-1 THENP0KE1400
390 GET#4:IF#4=-2 THENP0KE1400
380 GET#4:IF#4=-3 THENP0KE1400
370 GET#4:IF#4=-4 THENP0KE1400
360 GET#4:IF#4=-5 THENP0KE1400
350 GET#4:IF#4=-6 THENP0KE1400
340 GET#4:IF#4=-7 THENP0KE1400
330 GET#4:IF#4=-8 THENP0KE1400
320 GET#4:IF#4=-9 THENP0KE1400
310 GET#4:IF#4=-0 THENP0KE1400
300 GET#4:IF#4=-1 THENP0KE1400
290 GET#4:IF#4=-2 THENP0KE1400
280 GET#4:IF#4=-3 THENP0KE1400
270 GET#4:IF#4=-4 THENP0KE1400
260 GET#4:IF#4=-5 THENP0KE1400
250 GET#4:IF#4=-6 THENP0KE1400
240 GET#4:IF#4=-7 THENP0KE1400
230 GET#4:IF#4=-8 THENP0KE1400
220 GET#4:IF#4=-9 THENP0KE1400
210 GET#4:IF#4=-0 THENP0KE1400
200 GET#4:IF#4=-1 THENP0KE1400
190 GET#4:IF#4=-2 THENP0KE1400
180 GET#4:IF#4=-3 THENP0KE1400
170 GET#4:IF#4=-4 THENP0KE1400
160 GET#4:IF#4=-5 THENP0KE1400
150 GET#4:IF#4=-6 THENP0KE1400
140 GET#4:IF#4=-7 THENP0KE1400
130 GET#4:IF#4=-8 THENP0KE1400
120 GET#4:IF#4=-9 THENP0KE1400
110 GET#4:IF#4=-0 THENP0KE1400
100 GET#4:IF#4=-1 THENP0KE1400
90 GET#4:IF#4=-2 THENP0KE1400
80 GET#4:IF#4=-3 THENP0KE1400
70 GET#4:IF#4=-4 THENP0KE1400
60 GET#4:IF#4=-5 THENP0KE1400
50 GET#4:IF#4=-6 THENP0KE1400
40 GET#4:IF#4=-7 THENP0KE1400
30 GET#4:IF#4=-8 THENP0KE1400
20 GET#4:IF#4=-9 THENP0KE1400
10 GET#4:IF#4=-0 THENP0KE1400
0 GET#4:IF#4=-1 THENP0KE1400
```

Open Forum

REAL ARCADE ACTION! FROM JETSOFT



BMX STUNTS

BMX STUNTS Based on the original arcade game this action packed game challenges your skill over six tests, straight race, wheelie, ramp jump, slalom, bunny hops and the ultimate test over a V.W. beetle in the Beetle ride.



Cavelon II

Can you destroy the wicked wizard of castle Cavelon? Only after negotiating the six levels in his castle. Collect all the door pieces before you can attain the next level. Help is at hand in this all thrills, all action, real arcade game, when excalibur appears, achieve indestructibility.



Quari

27 levels of increasingly difficult real arcade action. Based on the game Bongo, you must avoid the chasing dinosaur, pterodactyls, falling rocks, native spears and bouncing Bongos. Negotiate rope bridges and erupting volcanoes, picking up the treasures of a lost civilisation as you go - and finally cage the dinosaur - if you can!

FAST LOAD 1 1/2 minutes
All 3 games for Commodore 64

061-775 0333

the arcade people

JetSoft

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: 0933 88354. 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.

SYNTAX ERROR!

WHO'S KIDDING WHO?

Please send me **FREE** and without obligation details of the new service for home micro owners that

PUBLISHES A FREE NEWSLETTER

OBTAINS MEMBERS DISCOUNTS

OFFERS FREE ADVERTISING

**INVESTIGATES COMPLAINTS AND
GUARANTEES REPLACEMENT/REFUNDS**

*I understand I will also receive
a 'free copy'
of the 'Home Micro' monthly Newsletter*

NAME _____

ADDRESS _____

THE INDEPENDENT
HOME-MICRO
CONSUMER SERVICE & NEWSLETTER

SEND TO 'HOME MICRO' freepost 3 FLEET STREET, LONDON EC4A 4SL

Line Feed

on Amstrad

As the User Manual informs you, the Amstrad Basic issues a line feed *Chr\$(10)* and a carriage return *Chr\$(13)* to a printer. If your printer, as mine does, also line feeds then *list* produces a double spacing. My

solution is to use a short sub-routine to detect *Chr\$(10)* and to change it.

The jumpblock for printing a character is

\$8D2B which is in Ram and so can be amended. My program Pokes a jump to

43000 and Pokes into 43000-43008 the following:
CP 10 — Compare A with 10
JRNZ 1 — jump if not 10

ADD A,A — Doubles A to 20
RST 08 — Default codes at \$BD2D = CFF28C
To test, enter the listing then run it. Set Width 255 then list, #8. You should get a normal listing.
For future use Save this program, then Load the program you wish to list.
Width 255 then list, #8.

Line Feed
by J Povey

```
10 CLS:MEMORY 42999
20 FOR a=48427 TO 48429
30 READ b:POKE a,b
40 NEXT a
50 FOR a=43000 TO 43008
60 READ b:POKE a,b
70 NEXT a
80 DATA 195,248,167,254,10,32,1,135,207,242,135,201
```

The Music Box

Half-way good



I've just spent a couple of hours playing with Super-soft's *Music Master* program, written for the Commodore 64 by Nick Hingham. Like all the music programs around at the moment, *Music Master* is a half-way good program — which is only to say that it has weaknesses and strengths. Despite the program's regrettable name, its strengths make *Music Master* the equal — if not the superior — of any program designed to turn the 64 into a real-time keyboard. In particular, the pre-set backing-track facility is versatile and sounds good (even though an unmodified TV set). Where *Music Master* falls down is on its sequencing — the ability to digitally record tracks.

If I've missed something in either of these programs (which, incidentally, share this lack with Quicksilver's *Ullsynth* and Commodore's own *Music Maker*) please let me know. I suspect I haven't, partly because my own experience suggests that the timing of a three-channel sequencer is quite tricky, since you have to read and write to the computer's sound chip at more or less the

When will somebody produce an adequate self-contained sequencer allowing over-dubbing and mixing of the 64's three sound channels from the computer keyboard in real-time? Even the much-vaunted *MusicCalc* from the American company Waveform is lacking in this respect. The important thing, as far as sequencing is concerned, is to be able to hear one track while you are recording another — in other words, to be able to accompany yourself. While *MusicCalc* allows you to alter and edit tracks at will, it only allows you to do this with great difficulty, and the ability to accompany yourself in a simple and obvious way seems to be entirely absent.

The model of step-time sequencing has to be Island Logic's *The Music System* for the BBC Model B (a Commodore version is expected in Spring next year).

This is the nearest thing to a real composing program, allowing you to write music to actual staves in authentic composing fashion. What's more, the staves can then be dumped to any Centronics dot-matrix printer. I hope somebody comes up with a form of

really helpful to the composer, distinctly unweaving and not graphs which look nice but are uses grids and funny bar-

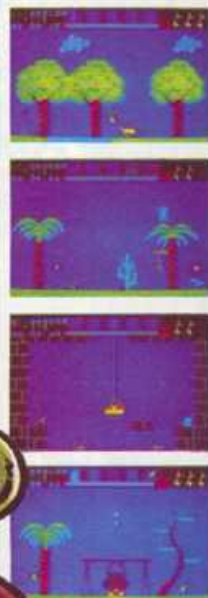
Step-time sequencing is not a new matter. This involves writing notes in one form or another and using the screen as a sort of score. Notes are entered in sequence but one step at a time, often by typing in their name (C-major, for example). Here *Music Master* has the edge on *MusicCalc*, even though it is still not perfect, by any means. The problem is with notation — *Music Master* uses parallel lines on which note names appear as *Master* uses notation — *Music Master* is another, and the manual, which seems to have been designed for good looks rather than clarity, is the third. Nevertheless, a composing tool to be reckoned with — I can hardly wait for the 64 version.

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 products 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.

AT LAST THE ARCADE ADVENTURE FROM MICROMEGA

Available through
good computer
stores everywhere.



BY DEREK BREWSTER

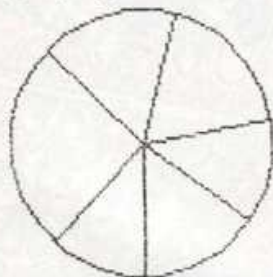
22 screens of stunning cartoon animation. Swinging through the trees collect, drop and use the objects scattered around. Speed of reaction is one thing. In Jasper you must also think fast and plan accurately... can you handle it?

Open Forum

Pie charts

on Spectrum

This will convert percentage inputs into 100% as an input. Your various entries are labelled and displayed at the end of the operation.

Pie charts
by D Heron

SINC. USER 12%
P.C. U. 25%
P.C. N. 17%
SINC. PROG 16%
COMP TODAY 13%
16/48 TAPE 15%

MARKET SHARE 1980/84

```
350 LET A=ADD/180*PI360 LET X=5
0* SIN A: LET Y=50*COS A
370 CIRCLE 200,88,50
390 PLOT 200,88: DRAW X,Y
400 BEEP .05,0
410 LET I=(A(R)/360)*100
420 PRINT AT K,L:B$(R,1 TO )
430 LET K=K+1:440 NEXT R
445 BEEP .1,30
450 PRINT AT 21,2:"COPY"
460 IF INKEY$="" THEN PRINT AT
470 IF INKEY$="Y" THEN PRINT AT
480 PAUSE 100: GO TO 100
MARKET SHARE 1980/84
SINC. USER 12%
P.C. U. 25%
P.C. N. 17%
SINC. PROG 16%
COMP TODAY 13%
16/48 TAPE 15%
```

```
100 REM © DEREK HERON 1984
110 CLS : PRINT INK 2:AT 10,0:"
120 PRINT INK 1:AT 12,0:"
130 PAUSE 0. CLS:350 POKE 23558,8
140 INPUT "CHART TITLE ";T$: B
150 INPUT "NUMBER OF ENTRIES";N
160 BEEP .05,30:170 DIM A(N): DIM
B$(N,10): LET SUM=0:180 FOR T=1 TO N
190 PRINT AT 4,2:"ENTRY NUMBER";T
200 BEEP .05,40
210 INPUT "PERCENTAGE TITLE";B$(T)
225 BEEP .05,40:230 INPUT "PERCENT
AGE";P:240 LET SUM=SUM+P:250 IF
SUM>100 THEN LET SUM=SUM-P: GO TO
260:270 PRINT AT 6,2:"TOTAL PERCENT
AGE";SUM:280 LET P=(P/100)*360
270 LET A(T)=P:280 IF SUM=100 THEN
PRINT AT 6,2:"TOTAL PERCENTAGE";
SUM: BEEP .1,30: GO TO 300:290 NEXT
T:300 CLS:305 PRINT INK 2:AT 1,1:32-
LEN T$)/2: INVERSE 1,1:T$;10 LET ADD
=0:LET K=4:LET L=2:320 FOR R=1 TO N
330 LET T=A(R):340 LET ADD=ADD+T
```

Book Ends



Book Puffin Dic-
tionary of Compu-
ter Words Price
£1.95 Supplier
Puffin Books.

information interesting. The book contains more than 400 entries, and is written and illustrated in a very attractive, interesting and entertaining way. The real joy of this book is that you don't need any special background knowledge of computers to use it. Anyone from nine to 90 can read it and learn from it.



John Minson
Book Dynamic
Games for the
Amstrad Price
£5.95 Micro Arms-
traded CPC464 Sup-
plier Interface
Publications, 9-11
Kennington High
Street, London
W8 5NP

A book that goes totally against the grain in terms of all that I hold dear, being totally boring and uninteresting in terms of basic concept. On the other hand *Dynamic Games for the Amstrad* doesn't have that much competition as yet, so undoubtedly it's of some interest to Amstrad owners.

If you want a book consisting entirely of listings for games, most of which you will play only once or twice then this is the one for you. It is undoubtedly no worse than the ones which will follow it.

Don't reinvent the wheel. That's the tact advice of this book which details the functioning of the Spectrum Operating Sys-



Book The Spec-
trum Operating
System Price
£5.95 Micro
Puffin Micro Press
Castle House, 27
Tombidge Wells,
Kent

tem. Understanding the system is important for reasons other than pure academic education. Many basic machine code rou-

ties, common to all kinds of machines, are covered in the book. The book does not merely explain what each routine does and where they are located in memory, but contains detailed information about what elements of the routine may, and may not, be played around with. For example, in some routines apparently innocent mutations will play havoc with the stack pointers causing... well... best not to talk about it. Detailed and useful information backed up with numerous appendices and comprehensive (and vital) index — a good buy for initiates.

John Minson



'Another winner in The Hobbit class. It's a complex real time adventure which will keep devotees puzzled for hours.' *DAILY EXPRESS*

'Sophisticated, rich in atmosphere and amazingly detailed, Sherlock is a game which no Spectrum owner will want to be without.' *MICRO ADVENTURER*

'Sherlock is a long way ahead of the rest of the competition.' *PERSONAL COMPUTER NEWS*

'In Sherlock you can not only talk to other characters, of whom there are at least thirteen, and ask them to do things for you, but you can also interrogate them and even discuss the case.' *SINCLAIR USER*

'Sherlock Holmes has been well worth waiting for with an 800 word vocabulary, real Victorian transport system - cabs and trains and all, and a cast of characters, peopling screens of graphics designed by Mugsy man Russell Comte.'

YOUR COMPUTER

'An intriguing and absorbing game.'

COMPUTER AND VIDEO GAMES

'I have been totally enthralled with this new brilliant adventure. I thought The Hobbit was good, but the added vocabulary and the even more intelligent characters, makes Sherlock number one in my software collection.'

MR. ROGERS, BATH

'Sherlock must be the most complex adventure ever created.'

The creation of atmosphere is superb (more like that of a novel, than a computer game) in fact playing the adventure feels more like acting than playing a computer adventure.

The characters in Sherlock behave just as they would in real life and have a very human feel to them, not only in the way they react to situations, but also in their displaying of human emotions.'

MR. STERN, HERTS

'Rich mental imagery.'

CRASH

'Sherlock is an adventure which has yet to be beaten.'

'Sherlock is a superb program and will provide many hours (hours? months more likely) of stimulating entertainment.'

PERSONAL COMPUTER NEWS

'Sherlock is an excellent adventure bursting with atmosphere, challenge and inventiveness.'

'Sherlock the adventure is about as devious as Sherlock Holmes the master sleuth.'

POPULAR COMPUTING WEEKLY

[POP1/12A]

Available for C64 and Spectrum 48K
Melbourne House



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.

GOODE BYTE

SPECTRUM

GAME	RRP	OUR PRICE
CYCLONE	5.95	4.75
DALEY THOMPSON	6.90	4.99
BEACHHEAD	7.95	5.95
WHITE LIGHTNING	14.95	10.50
SHERLOCK HOLMES	14.95	10.50
SABRE WOLF	9.95	6.95
KNIGHTS LORE	9.95	6.95
UNDERWORLDE	9.95	6.95
LORDS OF MIDNIGHT	9.95	5.95
DOOMDARKS REVENGE	9.95	5.95
PSYTRON	7.95	5.95
FRANK N. STEIN	5.95	4.50
T.L.L.	5.95	4.50
TRASHMAN	5.95	4.50
NIGHT GUNNER	6.95	4.95
CLASSIC ADVENTURE	6.95	5.25
MONTY MOLE	6.95	5.50
FULL THROTTLE	6.95	5.75
MATCHPOINT	7.95	6.75
TWIN KINGDOM VALLEY	7.95	6.75
AVALON	7.95	5.25
ENDURO	7.95	5.50
SCRAMBLE	15.95	4.75
EDDIE KIDD JUMP	7.95	4.95
COMBAT LYNX	7.95	5.25
KOKOTONI WOLF	5.95	4.75
DUES EX MACHINA	15.00	10.75
STAR STRIKE	7.95	4.95
JET SET WILLY	5.95	4.50
STAR STRIKE	5.95	4.50
TRAVEL WITH TRASHMAN	5.95	4.50
HAVOC	7.95	5.95
BACK PACKERS GUIDE TO	7.50	4.95
QUASIMODOS REV.	6.90	4.90

TIR NA NOG	9.95	6.95
AIR WOLF	6.90	5.25
MATCH DAY	6.90	4.90
PYJAMARAMA	6.95	5.25
BATTLE CARS	7.95	5.95
D DAY	7.95	5.95
TOWER OF DESPAIR	7.95	5.95
LODE RUNNER	9.95	7.25
GREAT SPACE RACE	14.95	11.25
POTTY PIGEON	6.95	5.25
PITFALL II	7.95	5.95
VALKYRIE 17	9.95	7.50
RAM TURBO INTERFACE		18.00

COMMODORE 64

GAME	RRP	OUR PRICE
GHOSTBUSTERS	10.95	8.50
SUICIDE EXPRESS	7.95	6.50
OTHER ACTIVISION	9.95	7.25
ZIM SALA BIM	9.95	6.95
STRIP POKER	9.95	6.95
OSYTRON 64	7.95	5.25
TALES OF ARABIAN NIGHTS	7.00	3.75
BEACHHEAD	9.95	7.50
SOLO FLIGHT	14.95	11.00
DEATH STAR INTERCEPTOR	9.95	7.50
BRUCE LEE	9.95	7.50
NATO COMMANDER	9.95	7.50
SPIRITFIRE ACE	9.95	7.50
MY CHESS II	11.95	8.25
BATTLE FOR MIDWAY	8.95	4.95
HAVOC	9.95	7.50
ANCIPITAL	7.50	5.50

QUASIMODOS REVENGE	7.90	5.90
T.L.L.	7.90	5.90
KOKOTONI WOLF	6.95	5.25
ZAXXON	9.95	7.50
SUMMER GAMES	14.95	10.50
QUO VADIS	9.95	7.50
SHERLOCK	14.95	10.50
PSI WARRIOR	9.95	7.50
STORM WARRIOR	8.95	4.90
RAID OVER MOSCOW	9.95	7.50
STAFF OF EARWATH	9.95	7.25
F-15 STRIKE EAGLE	14.95	11.00
BLUE MAX	9.95	7.50
TAPPER	9.95	7.50
SELECT 1	12.49	8.50
SPY VS SPY	9.95	7.50
BOULDER DASH	8.95	7.25
HOBBITT	14.95	9.99
DALEY THOMPSONS DECATH.	7.90	5.50
KONG'S REVENGE	7.90	5.90
ROLANDS RAT RACE	7.90	5.90
MATCH POINT	7.95	6.50
FIGHTER PILOT	9.95	7.50
TORNADO LOW LEVEL	7.90	5.90

ALL PRICES INCLUDE P&P

QUICKSHOT II ONLY £8.99
PLEASE NOTE IF OUR ORDER
EXCEEDS £50 YOU GET
10% FURTHER DISCOUNT
SEND CHEQUES /P.O. TO
GOODBYE PCW10
94 LEATHER LANE, LONDON EC1
PLEASE STATE WHICH MICRO

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 ALWAYS, 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.)

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)



Boxed, with detailed instruction booklet



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

3D COMPUTERS

THE HOME COMPUTER SPECIALISTS

XMAS BARGAINS

BBC SINGLE DISK DRIVE
200K DOUBLE SIDED CASED,
CABLE, MANUAL, DISK **£120**

COMMODORE 1520 COLOUR
PRINTER/PLOTTER **£57.50**

SINCLAIR QL **£385**

QL14 Monitor **£195**

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

Branches at:

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





Out of guarantee

Mark Kinsman of Worthing, Sussex, writes:

Q Do you know of any company that will buy an out of guarantee 48K Spectrum (issue 3). I do not wish to sell it privately as I need to sell it quickly.

A There are a number of "used computers", however, I am not in a position to recommend any of them, not having dealt with them myself, or having heard of anyone else who has dealt with them.

Personally I would try and sell your machine yourself, either via an advert in your local paper, or in PCW Classic (cheap). You should realise that you will get more money for your machine if you sell privately as you cut out the middle man.

Top of the league

Andrew Bolsover of Sheffield, writes:

Q I own a Spectrum and am trying to create, save and load files to and from tape. Please could you tell me how to go about this? The files I want to create are the number of matches currently played by my favourite football team's players. It's the numbers I want to be able to save, in order to be able to load the previous total and add to it accordingly. I hope you follow my drift.

A How about this, Andrew? 10 DIM S(20):REM array for matches played — 20 players

REM set up array of

matches played
100 SAVE "matches" DATA S():REM
stores matches played array
110 REM on cassette.

REM prepare for updating
of matches played
200 LOAD "Matches" DATA S():REM
load matches array back
210 REM into the array S, ready for
updating.

This process of Save and Load Data, can be used for any type of data (string or numeric) and for any length of array. The only point to remember is that you must have executed a Dim statement prior to loading the array, and that the Dim statement must be the same as when you saved the array.

Positional control

Paul Haigh of London, writes:

Q I am looking for methods of positional control using a small micro. The machine that I have is a Spectrum, and I was hoping to use this to control a number of stepping motors. I would be grateful if you could tell me who to contact as regards an interface or whether there is a book on this subject that may help me.

A There is a book that should help you with this project. It is called the Sinclair Database and was written by Beardsmore et al.

One more thing I think you would also be well advised to look at is the Spectrum Hardware Manual published by Melbourn House as it contains a lot of information which will be useful to you.

Stamped issue 3

Paul Shipley of London, writes:

Q I intend buying a second-hand Spectrum. As the issue 3 is the latest version, this is the one I will choose. Is there a big issue 3 stamped on the case, and if not, how can I tell the difference between the three issues?

A Also, is there a short program or routine I could use which will test the machine and draw attention to any faults?

A Unfortunately the issue 3 does not have anything

Design problem

Dominic McCann of Liverpool, writes:

Q I have now had my Spectrum for three months, and all this time I have wanted to write my own game. I can do the Basic loader with no problems. It is just the picture that bothers me. Firstly I have no idea how to design it, and secondly I don't know how to make the screen scroll in any direction. How do I go about this?

A Designing a screen object is a tedious task, but it is a task that requires some artistic talent. If like me you are no Van Gogh, then using tracing paper you can copy pieces of existing drawings and transfer them onto squared paper. Print N Plotter Products manufacture paper suitable for this purpose, which is available from most computer shops.

Your second problem can only be solved by you understanding how the Spectrum display file works, and obtaining, or writing, scroll routines. One good source of such routines is a book that I have mentioned before; Supercharge Your Spectrum, published by Melbourn House.

Data transfer

E A Duncan-Dunlop of Bridgend, Mid Glamorgan, writes:

Q How can I network between a QL and an issue 3 Spectrum? What do I type in to the QL? What do I type in to the Spectrum? Are the baud rates the same? (My QL is the PM version.)

A PCW Vol 3, no 34 contained an article, by B Corhill, on sending QL listings to a ZX printer attached to a Spectrum. The baud rate used (on both machines) was 600, although the article did refer to using the Spectrum printer, the principles of data transfer remain the same. Instead of using Lprint on the Spectrum, the data passed across could have easily been put onto microdrive, or stored in the Spectrum memory.

Unofficial command

J J Smith of Port Glasgow, Inverclyde, writes:

Q I have a ZX Spectrum 48K and know machine code. Only recently, I discovered that there are assembly language mnemonics which exist that are not in the Spectrum manual. Is there any book which lists these "unofficial" instructions?

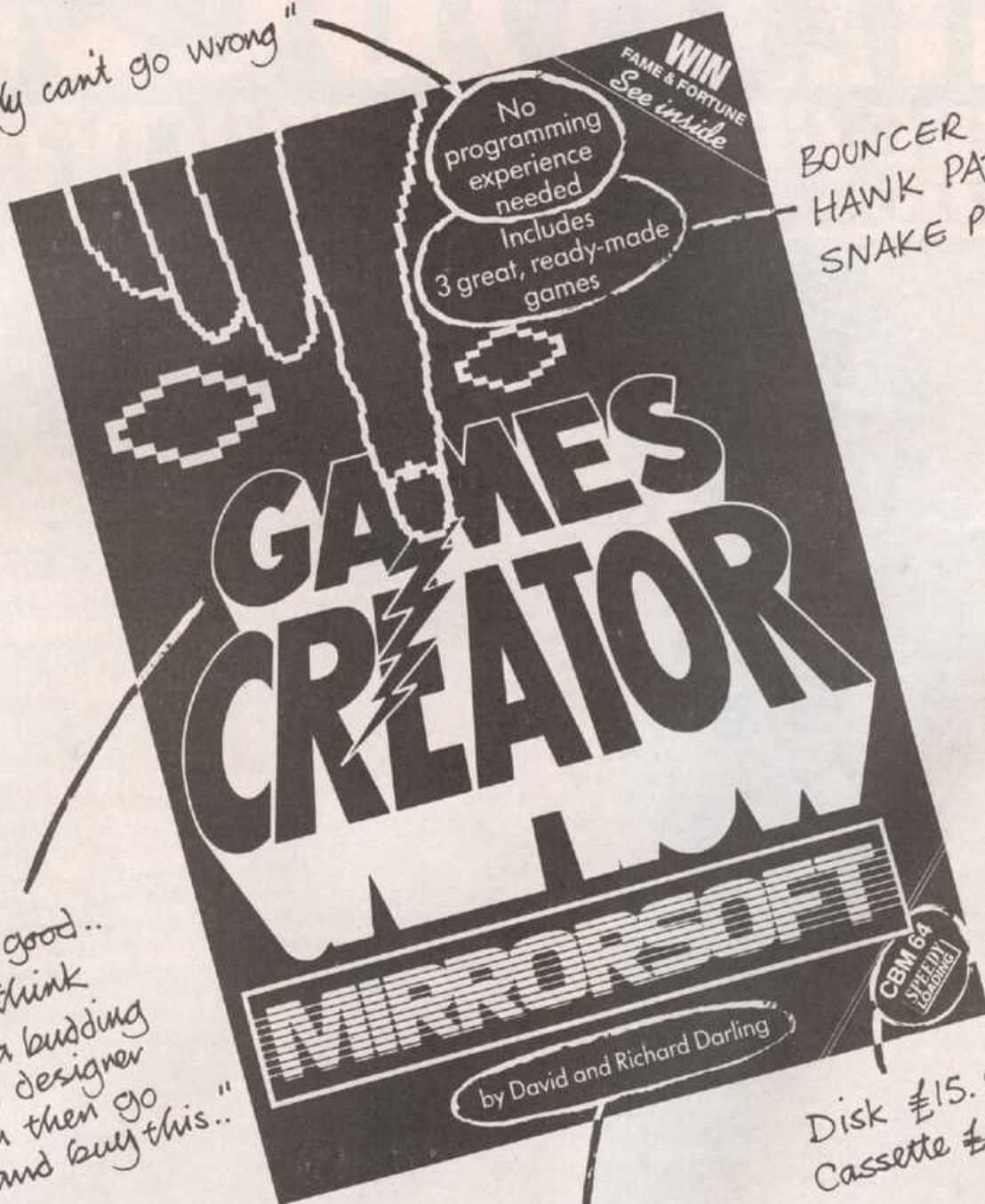
A As you quite rightly point out, there are a number of Z80 instructions that are not documented in the Spectrum manual. This is simply because they are not of particular interest to Spectrum machine code programmers. Having said that however, the book that you want (if you are still interested in pursuing your quest) is Z80 Assembly Language Program-Assembly, written by Lance Leventhal.

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

GAMES WITHOUT END..

"You really can't go wrong"

CCI Magazine,
November 1984



"... very good..
If you think
there's a budding
games designer
in you then go
out and buy this.."

Personal Computer News, 10 November 1984

"Programmers of the year"

CCI Magazine, December 1984

Disk £15.95
Cassette £12.95

Available from good software stockists everywhere or direct from
MIRRORSOFT, Mirror Group Newspapers Ltd., Holborn Circus, London EC1P 1DQ.
For free catalogue, write to: Mirrorsoft, FREEPOST, Bromley, BR2 9UX. (No stamp needed).

MAGBEC

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

CREATIVE SPARKS

WRITTEN AND DESIGNED BY OXFORD DIGITAL ENTERPRISES

Creative Sparks, 296 Farnborough Road, Farnborough, Hampshire, GU14 7NF.

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

+ single P&P sum

Total to send

£ : p

£ : p

£ : p

Method of payment

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

Enter card no.



☐ By Access or Barclaycard

Sign below:

Name

Address

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

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

PCW1284

I LOVE YOU

little floppies - so these are just for you!

Full depth colour-coded sleeves
Ruled both sides for extensive
contents listing and complete with
matching index tabs.
A complete filing and
identification system where you
need it - with your disks.

In packs of 10 sleeves and
tabs - £3.65 inc p+p
Specify colour
(red, green, blue or yellow)

TELCO INTERNATIONAL LTD.
Bulls Lane, Hatfield, Herts AL9 7AZ

Trade enquiries welcome.

for 5¼" disks.



AMSTRAD CPC464

I challenge you to survive in the 6 deadly worlds I have created!
Survive and you will truly be my equal. You will be plummeted into
a world of death where your wits will be your only friend.
The domains are: A terrifying 3D MAZE (with musical accompaniment).
A lonely Space Cruiser where you must vapourise all (3D). A terrible platform of fear where the evil blob is chasing
you, a doomed city under Nuclear Attack, an electric ball court -
can you win? Finally you find yourself in an enormous
intergalactic ship from which you must escape. There are many
problems to solve here.

ESCAPE FROM

PRINCE PULVERISE

Send £6 to STEELY SOFTWARE,
23 EGERTON ROAD SOUTH, CHORLTON,
MANCHESTER M21 1YP

OTHER AMSTRAD SOFTWARE COMING SOON

48 hr
DELIVERY

SOFT INSIGHT DISCOUNT SOFTWARE

SPECTRUM	R.P.P.	OUR PRICE	SPECTRUM	R.P.P.	OUR PRICE	SPECTRUM	R.P.P.	OUR PRICE
SHERLOCK HOLMES	14.95	11.00	PITFALL 2	7.95	6.20	DALEYS DIG	7.95	6.30
SPACE SHUTTLE	7.95	6.40	FIRE ON THE WATER	8.95	7.40	PSYTRON	7.95	6.20
ZOMBIE ZOMBIE	8.95	5.40	FLIGHT FROM THE	8.95	7.40	ROBOMANIA	5.95	4.50
LEAD RUNNER	8.95	5.40	DATA	8.95	7.40	SUMMER GAMES	14.95	11.15
ASTRONUT	8.95	5.40	DRIVE IN	5.50	4.40	3D ANT ATTACK	7.95	6.40
FALL GUY	8.95	5.40	XAVIER	5.95	4.50	GAMES CREATOR	12.95	10.00
STAR STRIKE	8.95	5.40	HOUSE JACK BUILT	6.95	5.40	J.S. IN	7.95	6.20
AE WOLF	8.95	5.40	SKOOL DAZE	5.95	4.70	OLD VANS	9.95	7.50
DRY GANGER	8.95	5.40	BOLDER CLASH	5.95	5.40	FIRE QUEST	9.95	7.50
SON OF BLADDER	8.95	5.40	KUNG FU	8.95	5.40	ALL INTERCEPTOR	7.00	5.40
PYJAMA JAMA	8.95	5.40	TURBOGIL	6.95	5.40	BATTLE FOR MIDWAY	9.95	7.40
DAILY'S DECATILON	8.95	5.40	GRAT SPACE RACE	14.95	11.25	PSI WARRIOR	9.95	6.50
DARK STAR	7.95	5.30	MATCH DAY	7.95	6.40	SHERLOCK HOLMES	14.95	11.00
RIVER RAID	7.95	5.30	AMSTRAD			BRUCE LEE	14.95	12.00
RETURN TO EDEN	8.95	7.50	HUNCHBACK	7.95	6.20	BEAKY AND THE I.S.	7.95	6.20
ALL LEVEL 9	9.95	7.50	BLINGER	7.95	6.20	SUICIDE EXPRESS	7.95	6.20
1 LORDS OF MIDNIGHT	9.95	6.90	ALL AMSTRAD GAMES	8.95	7.50	EUREKA	14.95	11.05
DOOMARKS REV	9.95	7.40	STEVE DAVIS SNOOKER	7.95	6.40	PYJAMA JAMA	7.95	6.20
COMBAT LYNX	8.95	7.20	MANIC MINER	8.95	7.50	SELECT 1	12.49	9.60
BATTLE LARS	7.95	6.20	ALL LEVEL 9	9.95	7.60	GHOSTBUSTERS	10.95	8.50
D-DAY	7.95	6.20	THE			FIGHTER PILOT 64	9.95	7.40
TIR NANO	9.95	7.50	JET PAC	7.95	6.20	TLL	7.95	6.20
BACKPACKERS	7.50	5.50	ELITE	14.95	11.50	WHITE LIGHTNING	19.95	14.95
WHITE LIGHTNING	14.95	10.40	3-C GRAND PRIZ	8.95	7.50	Turmoil	15.95	11.50
DANGER MOUSE	14.95	10.40	FRAB	8.95	7.50	HUNCHBACK II	7.95	6.40
SELECT 1	14.49	9.60	FORTRESS	8.95	6.75	KING STRIKES BACK	7.95	6.40
POTTY PIGEON	8.95	5.40	MANIC MINER	7.95	6.20	ELECTION	12.95	10.05
STEVE DAVIS SNOOKER	7.95	5.30	CONQUERING	9.95	7.60	ALL PRICES INCLUDE 48 HOUR RECORD DELIVERY***		
EUREKA	14.95	11.25	ALL OF U.S. GOLD	9.95	7.40	Please make cheques payable to		
UNDERWORLD	9.95	7.60	STAFF OF KARATH	9.95	7.60	Soft Insight and send to SOFT		
KNIGHTS LORE	9.95	7.60	THE PRINCE	14.95	11.50	INSIGHT, PO BOX 600, LONDON		
GHOSTBUSTERS	7.95	6.20	ALL ACTION	9.95	7.60	SE37ER. Access orders/enquiries		
TOWER OF DESPAIR	7.95	6.20	ALL LEVEL 9	9.95	7.60	01-305 0790.		
VALKRIE 17	9.95	7.20	STRIP POKER	8.95	7.40			
CYCLONE	6.95	5.40						

GAMESMANSHIP

Min 15% discount on software for all computers

SPECCY	£8.45	C64	£6.80	BBC	£6.95
Knight Lore	£8.45	Storm Warrior	£6.80	Football Manager	£ 6.95
Fall Guy	£5.90	Jet Set Willy	£6.90	Fantasia Diamond	£ 6.95
Cyclone	£5.90	Zaxxon	£8.45	Scrabble	£13.50
Jasper	£5.80	Raid over Moscow	£8.45	Manic Miner	£ 6.75
Braxx Bluff	£5.75	Beachhead	£8.45		
Avalon	£6.75	Ancipital	£6.35	DRAGON	
Underworld	£6.80	Pyjamarama	£6.80	Back Track	£ 5.45
Drive In	£4.95	Combat Lynx	£7.75	The King	£ 5.99
Super Mutt	£4.95	Kokotini Wilf	£5.90	Cuthbert Digging	£ 5.99
Backpackers Guide	£6.35	T.L.L.	£6.65	Cuthbert/Walkabout	£ 5.99
Kung Fu	£5.90	Tom Thumb	£4.95	Manic Miner	£ 6.75
Paytraxx	£6.70			AMSTRAD	
Astronut	£6.35			Flight Path 737	£ 5.90
Zombie Zombie	£5.80	Perils of Willy	£4.95	Johnny Reb	£ 5.90
Turmoil	£5.90	Fatty Henry	£4.95	Manic Miner	£ 7.55
Twin Kingdom V	£6.70	Hunchback	£5.85		
Pyjamarama	£5.75	Dodos Lair	£4.95		
Frank N Stein	£4.80	Tom Thumb	£4.95	Large Selection always	
Travel with Trash	£4.95	Oily	£5.85	available for Oric/Atmos	
Anyfirebird	£2.10			ZX81 etc	

Cheque for lists. State which Micro. Fast Service. Guaranteed originals.
Cheque or P/O to S. Briggs, 65 Cassiobury Ave, Bedford, Middx.
Ring 01-890 5636 for friendly service.

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
HYPER SPEED with full error checking. Converted pro-
grams 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 most versatile on the market. This is the
simplest to use and most efficient tape to disk transfer utility
yet devised. No program rewriting is required and transfer-
red 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.

been watching its progress since its release. I hope these tips will get some of you on the way to fulfilling the Quests.

Before I discuss *Machbeth*, which has just been released, I must declare my interest in the program. The team of seven who created the adventure were given their brief by Sunshine Publications, who are the publishers of this magazine. So you can imagine that I feel rather like a distant cousin to someone who has made a Number One record. I wasn't involved in the development of the program but, even so, I've

To find Drapnir, you need to go to the location north from Despat. The way to get there, though is not so simple. First go to the Pits of Hell, and give Olnir to someone. This tip comes from John Ashcroft, who carries on. "I always use Snor, as he will pay you for it then drop it later for you — and he hardly ever gets killed! Then go east, jump to Hel, summon Help. Then go north, and north again, where you will find a chest."

I do an update on the program. mentioned in a couple of weeks time, when comments on Lord of Midnight will be yours — your Thanks for those tips, Iain — your "Finally, a good map is essential."

are just beginning... "Finally, a good map is essential."

but I think you will find that your Troubles Hall. This should get you started on Skallir. Drapnir, you can travel north from Klepto's instance, if you are carrying Skornir, but not two conditions instead of the usual one. For to enter certain locations you have to satisfy searching for the later quest objects, is that "An important point to remember, when one.

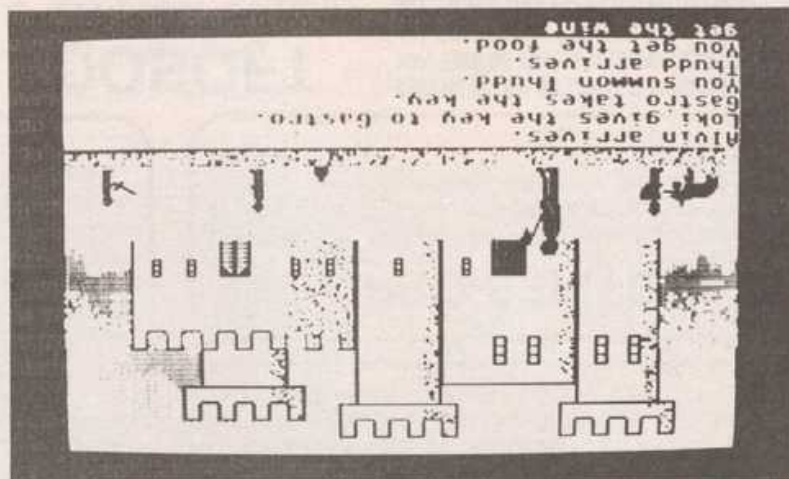
are several where you must not be carrying must carry a helmet to enter, though there use. I haven't found a location where you Felstrong. Likewise, a helmet is not much round to searching for Grimnir, you will than an axe, although when you finally get to enlist help.

heavy for you to open, so that you will need are in chests or cupboards that are too Bodir and Thor) is that all the quest objects with the Gods (especially strong ones like "Another reason for remaining friendly goods. Of course, he may refuse."

God, and ask him nicely to return your friendly God. In this way, if you need it get rid of such an object, then give it to a quest objects. If for some reason you must "It is generally not a good idea to drop ringway in Rankle's Hall.

not possess the Felstrong 'Bug', ie, a of the other objects, even if your copy does Felstrong is much easier to find than many. Felstrong quest is completed. Incidentally, where Felstrong is needed until after the you will not come across any locations 9800. Felstrong is necessary here, though To restart the program after this, type Coto to get an immediate response to Summon. immediate response to Help, and line 2005 into a chest. Omit line 6550 to get an TB), the best way being to put six objects sound a little like Tony Kendle's column, break into the program (this is getting to the game any easier, just a little faster. First, strictly, cheating as it doesn't make the might find the following useful. It's not Help or Summon commands answered "Those of you fed up with waiting to get the had a particularly interesting follow-up: but Iain Gibson, from Hargate in Clydebank, Many of you have written in with this tip, you can lay your hands on it.

Klepto will have your treasure away before quick, however, or else that little thief the object of your first quest. You have to be west. There you will find a chest containing this will enable you to scout off to the north If you do then you have to remove him, and where you will almost certainly meet Krank. Michael. To get Olnir, go to Krank's Hall I hope that I can help you get somewhere, Drapnir seem to present no end of hassles. seem to cause no trouble, but Olnir and all the rest would unfold. "The later objects Quest objects. I'm sure that I can find Olnir everything but still can't find any of the and visited all the locations I can. I've done G Hill. "I have collected all useful objects Please give me a clue!" And this one from P Kay: "I haven't found any of the Quest items, basic than this — like the one from Michael. Actually, the question is often even more who must be present?"



Drapnir meets Machbeth



Tony Bridge's Adventure Corner

Tony Bridge's Adventure Corner

by Creative Sparks with great interest. It has been called, by one reviewer in a rival magazine, "probably the best adventure of 1984".

The price of £14.95 may seem rather a lot at first glance, but for this you get a nice chunky box, containing two cassettes, and a fat little book. This is the complete text of the play, edited from the original 1623 version by two members of the Oxford-based development team. Besides the play, the book also contains commentary on the characters and the play itself — on its own, the book is valuable; with the program, it's sensational! In fact, there are eight programs in all. Four are graphic and text adventures. These follow the usual adventure conventions — but the graphics are beautifully drawn (by another member of the team), and are "dynamic", that is, the picture will change as the player opens doors, takes objects and so on. The four adventures are different in approach, so that the player takes Macbeth's persona in the first and third games, and Lady Macbeth's in the second and last.

Macbeth is one of the bloodiest plays in the English language, and it is thrilling to be able to 'take part' in the action, and dictate it. A "strange device" in the first part of the program, is the newspaper which gives Macbeth information on the outcome of his battles — a novel but useful invention! With

the aid of this, and the text of the play, the player can guide the action along the path he knows it should take. After each section, there is a psychoanalytical interlude, during which the player will lie on the analyst's couch and answer questions on his actions. You don't have to use these extra programs, but your knowledge of the play will be deepened.

There's something here for everyone — the adventures themselves stand up against the best available for the Commodore, while the student of the play itself will learn a great deal from the book and programs.

Finally, some Help in Colditz, the adventure from Phipps. J Houghton writes from Southse: "How do I get rid of the Guard in the Tower? I have tried everything I can!"

Well unfortunately for the poor old guard (who's only doing his job, after all), you must *Kill* him with the sharp knife, and then grasp his uniform — you'll need it later on.

Phipps have just released three of their old favourites in a "Super Value Pack". It really is super value, too, as for just £7.99 you get *Magic Mountain*, *Greedy Gulch* and, one of my personal favourites, *Knight's Quest* all in one package — it's a steal. The company also tells me that they have recently signed a deal with Les Aventures of Paris, to translate their adventures into French. Apparently this feat has been beyond the powers of normal mortals until now, as there are a number of subtle grammatical problems to overcome. So, mes amis. Bon chance dans votre Quest, et do not blow le garlic dans mon visage!

Adventure Helpline

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

Fill in the coupon, explaining your problem,

send it to us, and a fellow adventurer may be able to help.

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

Adventure Problem on (micro)
 Name
 Address

THE KET TRILOGY



THE COMPLETE ADVENTURE CLASSIC

SINCLAIR
SPECTRUM 48K

AVAILABLE FROM
LARGER BRANCHES OF

John Menzies

AND ALL OTHER GOOD
SOFTWARE OUTLETS

**PRESENTATION GIFT PACK
SPECIAL PRICE £12.95**

INCENTIVE SOFTWARE LIMITED
54 LONDON STREET, READING RG1 4SQ

CREDIT CARD ORDERS
TELEPHONE (0734) 591678

Retailers contact: Microdealer UK,
Tiger, Lightning, Microdeal,
Lazer, Drake, R & R and Twang.

Semi-display — 26 per single cc
Lineage — 25p per word

GAMES SOFTWARE

ZX SPECTRUM 48K £5.95

THE ABOVE ADDRESS.

SOFTWARE

Glasgow

An entertaining adult adventure to

(S&P) 100 INDEX

TABLE 1.

tion.

4317 4343.

... **fun & play**

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

***** WORDS: 18 *****
***** per word 30 time job *****

Address.

=====

Telephone:

Please cut out and send this form to: Classified Department, Popular Computing Weekly,

12-13 Little Newport Street, London WC2H 3LD.

POPULAR COMPUTING WEEKLY

UTILITIES

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED

Ham TOS 9BR, Tel: 08045 55532.

Long Eaton, Nottingham NG10 3LU

Thrupp, Stroud, Glas, GLS 2DP.

100 Bienenheim Walk, Corby NN18 9HB

ML68 DP.

100, Co. Durham, DLS 70X.

'SHC CON. DISTRIBUTION' SUPPL.

Advan. 20 Hastings Rd, London N11.

1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

Maldenhead, Berkshire, SL6 6JX.

Cambridge, Surrey GU17 0AH

24 Edward Road, London E17 6LU

AMSTRAD ASSEMBLER

COMPLETE WITH: DISASSEMBLER AND FULL SCREEN EDITOR
(By the author of Beebug's 'EXMON')

OUTSTANDING FEATURES INCLUDE:

- * FREELY MIXED BASIC/MACHINE CODE — used with text editor for ideal debugging
- * PROFESSIONAL 80-COLUMN DISPLAY *SUPER FAST 3000 LINES/MIN
- * COLOURS IN 40-COLUMN MODE *COMPREHENSIVE INSTRUCTION MANUAL
- * NESTED CONDITIONAL ASSEMBLY
- * UNRESTRICTED LABEL NAMES — EVEN MNEMONICS CAN BE USED
- * FULL FEATURE, MENU-DRIVEN SCREEN EDITOR. Commands available include:
Move cursor character/line/page. Insert mode on/off. Forward/backward delete. Insert/delete line. Move/copy/delete block. Set tabs. String search and replace. Print text/block. Load/save all or part of text. Catalogue of files.
- * DISASSEMBLE OR HEX DUMP ANY PART OF RAM OR ANY ROM ON SCREEN OR PRINTER
- * EXPRESSION EVALUATION, plus a directory of commands — directives second to none

SPECIAL INTRODUCTORY OFFER

£11.60 (inc. p&p)
ARNOR LTD (dept. P)
P.O. Box 619,
London, SE25 6JL

—TRADE ENQUIRIES WELCOME—

CHRISTMAS PERIOD OFFER

ZX Spectrum, MAestro-ASM and Ultimon. The best editor/assembler and monitor package around. £6.95 each, £12.50 the two. Amstrad CPC464 MAestro-ASM. Full feature editor/assembler. Only £6.95.

MICROHOLICS ANONYMOUS

Lord Nelson House, 21 High Street, Yarm
Cleveland TS15 9BW
0642-787389
0642-785825

1 Rowan Place, Dundee, Scotland DD30 3PH. Tel: 0382 88233
Send cheques P.O.s to:
£3.50 (inc. p.p.)
£3.50 (inc. p.p.)
Redesigned Sprites and Sprite paths. Two extra rooms included: the most and the vault
NOW AVAILABLE
JESSET WILLY EDITOR MK II

COMMODORE 64 — VIC 20

Specially designed UTILITIES giving those extra facilities that prove so USEFUL TIME and TIME again.

BYTE BACK

COMMODORE 64/VIC20
So USEFUL you will wonder how you ever managed without it.

- TOTAL PROGRAM CONTROL and CRASH PROTECTION.** A simple to use RESET device giving TOTAL control over most programs. RE-ENABLES computer functions, RUN/STOP RESTORE, etc. RESTORES basic/M. Code Programs after reset or crash, without problem. Just plugs into your micro, no mods needed.
- A super MCode restore routine,** which can EVEN BE LOADED AFTER a disaster, and still totally recover the program.
- A mach code ASSEMBLER,** enter mach. code easily in understandable form. IDEAL for MODIFYING or writing programs without fear, even if they crash, you can reclaim them.
- (iv) Machine Code DISASSEMBLER,** helps take the mystery out of MCode. See how your favourite Programs work.

CASSETTE — £6.95/DISK — £9.95

SUPERKIT 64

COMMODORE 64 ONLY
Gives you those EXTRA FACILITIES to assist your programming. A SUPERB TOOLKIT of m-code routines. Complete RE-NUMBER (incl. GOTO-GDSUB/AUTO LINE/TRACE/FIND AUTO/RUN/BLOCK DELETE/M. Code MEMORY SAVE and more. Software Controlled flexibility, and at a sensible price. CASSETTE — £9.95/DISK — £12.95. Both programs give almost all the EXTRA UTILITIES for writing/modifying programs.

Eliminate C2N Datasette Problems.

REKORDAKIT 64

COMMODORE 64 ONLY
HEAR your Datasette Performing. Keep C2N in Tip Top condition. Simple to use plug-in device TEST/INFORMATION TAPE to ensure tape heads are correctly set. £6.95
REMEMBER state Computer. Cheque to: ASH BYPRODUCTS, P.O. Box 510 BIRMINGHAM B179ES.

Friendly Face

Microdrive Utility

Add these menu-driven loop routines to your programs for quick and easy cartridge file management. Self-duplicating "run" routine to load or erase any program on cartridge.

Separate routines, ready to merge with MASTERFILE and TASMWORD TWO, for trouble-free, daily professional use with Microdrives or cassette backup, including erase and catalog loop subroutines. Including over 10K of Basic routines, and 5000 word instruction manual. NEW Masterfile ACTION and MEMO formats, free with cartridge version.

MEMO is a free form, notepad format for ordered, referenced notes.

Cassette £6.95, Cartridge £12.95 incl. VAT. Order NOW to Monitor Ltd, Box 462, Mill Hill, London NW7 2JF. Write or call 01-956-1287 for leaflet.

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 LERM, DEPT WE1
10 Brunswick Gardens
Corby, Northants

Take a QUANTUM LEAP today... Make your SPECTRUM programs really come alive with up to 85 chars/screen line!

"Micro-print 85"

is THE outstanding machine-code utility which takes you far beyond the standard 32 or even 64 pitch printing formats. A constant choice from SIX widths allows:
Either 85 characters-per-line,
or 64 characters-per-line,
or 51 characters-per-line,
or 42 characters-per-line,
or 36 characters-per-line,
or 32 characters-per-line ...

Any pitch, any time, any place. Mix all six within any line. COPY any 1-24 line group. "Micro-print 85" is incredibly versatile — nothing else gets near it! The 16/48k cassette plus extensive demo of all features is £5 (£6 export) from

MYRMIDON SOFTWARE
PO Box 2, TAOWORTH, Surrey KT20 7LU

48K SPECTRUM TRIANGLE FILL

The universal 2-D solid element.
"be like the BEEB"
S.A.E. & £2 to:

P. Uloth, 1 High Street, Keswick, you receive:

DATA + LOADER + DEMO

A NEW DIMENSION IN COMPUTER GRAPHICS IS INVITED WITH SPECTRAW. NOW YOU CAN DESIGN AND DRAW YOUR OWN DRAWINGS USING: Spec Draw ZX SPECTRUM £3.50 LASERSOFT 41 Four Oaks Common Rd Four Oaks Sutton Coldfield B74 4NW

ORDER FOR CHRISTMAS

SPECTRUM SPEEDYLOAD: Halve your waiting time! This short program lets you SAVE/LOAD at 3000 baud. Easy to use with any tape command. Cassette (48K only), £2.95. Ness Micro Systems, Main St., Muir of Ord, Ross-shire IV6 7SU.

KWIKLOAD

For the 48K Spectrum

This amazing utility package allows Spectrum cassette programs to load 3 times the normal speed.

The Hobbit loads in 120 seconds

Scrabble loads in 136 seconds

Full instructions supplied to convert most commercial software — £4.95 inc or send SAE for further details.

Data View
32 Gladstone Road, Hockley
Essex SS5 4BT

ACCESSORIES

BANISH LOADING PROBLEMS

We are now the exclusive seller of the ELINCA Tape/Loader. Can only be obtained from us.

It is now available for the following computers: Spectrum, ZX 81, Oric-1, Atmos, BBC, Electron, Dragon & Atom, and sell only.

Please State Computer £14.99 inclusive Post Free
We also sell the ELINCA Loudmouth. A Spectrum sound amplifier for only £12.00 inclusive Post Free

CELINA Software

Business Help Series for the SPECTRUM. FILECAB. The only program you will ever need for that filing job. £15.00 incl.

STOCK. Keeps tabs on all your stock, with a running total of cash value of all stock. Add and remove stock at will. £15.00 incl.

PHODCOST. Ever wondered how to calculate the selling price of an item, this program does just that taking into account your overheads and how much profit you want to make. £15.00 incl.

For details send S.A.E. to:

CELINA LTD.
Daisy Walk, Sheffield S37PY, England.
Tel: 756728 (STD 0742)

MONITOR QUALITY PICTURE

Simply plug the Modern 3 between your computer and any television for a sharper, steadier picture. Send S.A.E. stating computer type. Only £29.95 + £1.75 p&p. Send cheques P.O.s payable to: Solar Computer Products, P.O. Box 4, Monmouth, Gwent NP5 4YZ. Tel: 0600 860661

BBC OWNERS

INPUT AND OUTPUT MODULES
Link your BBC to output and input devices using our interface boxes. Control buggies, model trains, etc., send signals; burglar alarms, light, temperature, etc.
For cat. and full details contact:
DC Software
29 Midway Road, Burnham-on-Crouch
Essex CM0 8ED — 0621 784228

BLANK CASSETTES

C10 £2.95 FOR 10, £22 FOR 100
C15 £3.05 FOR 10, £23 FOR 100 inc. p+p
FULLY GUARANTEED
Send cheque/PO to:

G.R.P., 369 Mile End Road,
London E3 4QS. Tel: 01-980 1186
ACCESS ORDERS BY PHONE

AQUARIUS

All available Hardware.
Vast range of cartridges.
All 'Digital Output' software.
Books, etc.

Send s.a.e for our mail order catalogue

Processor Ltd

A.O.S House 1 Willow Parade
Cranham Essex RM14 1DZ

NO FUSS LOADING

with the

LOADMASTER

when loading in future the built-in meter will give you a correct setting EVERY time.

Just plugs between recorder and computer. Price inc. P&P £11.49

Probmaster Ltd, 23 The Ridgeway,
Cuffley, Potters Bar, Herts EN6 4BB

ALL YOUR CASSETTE NEEDS

Blank cassettes C15 with case 40p
Labels in Blue, White or Yellow, 20 for 36p. Inlay cards in Blue, Yellow, Red, Green, Orange or Purple. 20 for 60p. Library cases 12p each. Postage on each complete order 60p.

Stonehorn Ltd., 59 Mayfield Way,
Barwell, Leicester LE9 8BL

PRINTER CABLES FOR SPECTRUM OR BBC

25 PIN D FOR RS232
MALE D £8.00 INC. P&P
FEMALE D £9.00 INC. P&P
CH/P.O.s PAYABLE TO:

G. TOWNSEND
26 Meon Rd., London W3 8AN

DISK BOXES

70 disks, beautiful flipover smoked lid — £13.99
90 disks, Locking box — £17.99

Immediate delivery to:

APERRE
67 Church Rd., London NW4

DISCO SCREEN

ADD A NEW DIMENSION to your MUSIC and MICRO. A totally NEW EXPERIENCE. Actually, LISTENS to your MUSIC, and REACTS to it. Watch as it takes up the MOOD of the MUSIC, and Produces FABULOUS, FASCINATING EFFECTS on screen. DISCO version is IDEAL for parties or to amaze your friends. RELAX version provides SUPERB background as you enjoy quiet moments. CASSETTE — £7.95/MOORE — £12.95
ASH BYPRODUCTS, P.O. BOX 510 BIRMINGHAM B179ES

DISK USERS

CDS D/S D/D — £13.80 for 10
Blank disks (mkt leaders) £15 for 10
Datalife S/S S/D £16 for 10
Dysan D/S D/D £24.80 for 10
Scatched disk can be regained with "Get-it-back" — only £6.99
All items 70p P&P
LOST 'N FOUND SOFTWARE
17 Pittfield St., London N1

BLANK CASSETTES

10 C10's for £3.65; 100 for £25.00
10 C15's for £3.85; 100 for £26.00
10 C20's for £4.00; 100 for £27.00
FULLY GUARANTEED. Inc. P&P
C.O.D. add 65p. Immediate Dispatch
U.K. HOME COMPUTERS
82, Churchward Ave, Swindon, Wils.
24 HFI Order Phone 0793-605034



01-437 4343

Book
or
Semi-display
adverted by
Credit
Card
Diane
Davis
on



JOYSTICKS FOR QL
COMPUTER SUPPLIES
146, CHURCH RD, BOSTON,
Lincs. PE21 0JX
NO INTERFACE REQUIRED. £7.99
each or 2 for £15.00. Add 50p p&g.



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 manus-
cript, ideas or fields of interest.
Full details of what we can offer from
David Lawrence, Book Editor, Sun-
don WCR3 3LD.
Sunshine Publishers of Popular
Computing and Dragon User.

SERVICES

SINCLAIR SERVICE CENTRE

We have the spares for all repairs to:
Spectrum, ZX81, ZX printer, ZX
pack
Spectrum
ZX81
ZX printer
ZX81 plus parts
£7.50 plus parts
ZX81 plus parts
£7.50 plus parts
All units repaired to original standard
using genuine Sinclair spares by our
H.N.C. Qualified staff. Also available
Spectrum Memory update 16K-48K fitted
by us £26.00 plus £2.50 first class post
and packing.
S.A.E. enquiries to: QUANTUM
33 City Arcade, Coventry CV1 5HX
or phone Coventry (0203) 24632

MICRO-SERV

The home computer repair special-
ist in Scotland
BBC, SPECTRUM, VIC 20 AND
ALL PERIPHERALS. 3 MONTH
WARRANTY ON ALL REPAIRS.
UNIT 4, Denny Workshops,
Denny, Scotland, FK6 6DW.
Tel: Denny (0324) 823468

Service and Repairs
SPECTRUM, BBC,
COMMODORE
MAIL ORDER OR CALL IN
Huge selection of software and full
range of accessories.
Enfield Communications,
135, High Street,
Ponders End, Enfield, Middx.
TEL: 01-805 7772

ENGINEERS!!

MANCOMP LTD. (dept. PCW)
Printworks Lane, Levenshulme, Manchester M19 3JP Tel: 061 224 1888
● Please phone for appi.
● No hidden handling charges.
● Special rates for school.
● 24 hour turnaround every micro insured for return journey.
● Only Co. in all U.K. offering while-you-wait service.
Average price £15
SEND THEIR MICROS TO US FOR REPAIR?
WHY DO SPECTRUM USERS FROM LONDON, DEVON, ESSEX & CAMBRIDGE



The M184 for SPECTRUM users
by MANCOMP LTD.
Designed by Programmers and Repair Specialists for
Simplicity, Speed, Safety & Space

BBC SPECTRUM REPAIRS
* Spectrum repairs £18.50 inc. parts in-
surance and p.p.
* BBC B repairs £18.50 + parts, insu-
rance and p.p.
Send your computer with cheque or P.O.
to: £18.50 and description of fault to:
SUREDATA (PCW)
Computer Service
45 Wychwood Avenue, Edgware,
Middx.
Tel: 01-951 0124

SPECTRUM repairs £12.50 all inclu-
sive, fast efficient 24 hr service, M.P.
Electronics, The Laurels, Wendling,
Derham, Norfolk (0362) 87327.

SPECTRUM REPAIRS
We expertly repair Spectrums for £15
inclusive of parts, labour and return
postage. Spectrums upgraded to 48K
for £28 including post.
R.A. ELECTRONICS, 50 Kimberley
Road, Lowestoft, Suffolk.
Tel: (0502) 66289

SPECTRUMS, DRAGONS AND
COMMODORES
Expertly repaired and thoroughly overhauled
by professional computer engineers using
only top grade components. Manufacturers
recommended modifications are fitted and all
Spectrums are fully guaranteed for six
months. Spectrums £20.00 total.
Dragons and C&B Free Estimates
MP ELECTRONICS
The Laurels
Wendling, Derham, Norfolk.
Tel: 0362 87327

HEMEL COMPUTER
CENTRE LTD.
For fast reliable repair service,
send your 16/48K Spectrum
computer to us.
We will repair and return for
£20 + £1.60 p&g.
Also BBC, Commodore, Alan
and Dragon service
Hemel Computer Centre Ltd.
52, High St.
Hemel Hempstead,
Herts.
Tel: 0442 212436

SINCLAIR COMPUTER REPAIRS
SPECTRUM
ZX81
ZX PRINTER
Inc. parts, p.p. and return insurance:
Spectrum upgraded to 48K for £24.
Fast turnaround — we like to take care of
your computer — please pack carefully
and send with cheque or P.O. to:
I.T. (WESTERN) ELECTRONICS
97 Newdown, Trowbridge,
Wils. BA14 0BB

EDUCATIONAL SOFTWARE

A NEW CONCEPT IN
EDUCATIONAL SOFTWARE
HISTEACH-64
For Commodore 64, an introduction to
History for children of any age! Numerous
features including: Humour, Animation,
Colourful Graphics, Poetry, Progress Re-
ports etc.
PRICE £8.50 from:
MEGATRON SOFTWARE
22 Mountfield Gardens, Kenton,
Newcastle upon Tyne NE3 3DB.
(Price includes postage and packing)

BBS SOFTWARE FOR 32K BBC
EXAM PREPARATION AND REVISION
COMPUTER STUDIES — 6 part Series Multiple
choice questions... Discs (2 parts) Tapes £5.95
each part
USING HAL & THE BMC (Disk) Assembly prog.
COMPUTER PIONEERS (Disk) Random access
B-Spread Spreadsheet program
B-WORD (Disk) Word processing 40 and 60 col
BBC 40 word Discs £11.50 each fully inc.
BOWKER BUSINESS SERVICES
4 Chiswick, LETCHWORTH, Herts. SG6 3UB
Tel. 04626 74457

QL SOFTWARE

QL DRAW
CUNSOR/JOYSTICK CONTROLLED
TEXT AND GRAPHICS DESIGNER.
SAVE, LOAD AND HI-RES PRINT OUT.
MENU DRIVEN, EXAMPLE SCREENS
£8.00, FOR IMMEDIATE DISPATCH
CHEQUES/P.O. to:
GT SOFTWARE,
77 WARWICK ROAD,
MILTON KEYNES, MK3 6AT

Do you need help getting
the best out of your QL?
Join I.O.L.U.G. Get our monthly
magazine of useful tips.
Contact the Secretary:
BRIAN PAYNE
24 Oxford St., Stonev Stratford,
Milton Keynes, Bucks.

BUSINESS SOFTWARE

SPECTRUM Software for business /
practical users, microdrive compatible,
Send sae/rf for catalogue, SD Micro
Systems (Dept PCW) PO Box 24 Hi-
chin, Herts, prompt despatch.

REPAIRS — ZX81 — Spectrum, Fast,
reliable repairs by experienced engi-
neers, having serviced Sinclair comp-
uters since the introduction of the ZX80.
Our price is inclusive of all parts, labour,
postage and VAT irrespective of fault.
* No hidden charges. * While-you-wait
service available. Spectrum £18.75,
ZX81 £11.50, 16K Ram £9.95. Call or
SEND WITH CHEQUE OR P.O. to: TV
SERVICES OF CAMBRIDGE LTD,
French's Road, Cambridge, CB4 3NP,
Tel: (0223) 311371.
COMMODORE REPAIRS. By Com-
modore approved engineers. Vic 20
modulator £6.50, Vic 20 from £14.50,
CBM64 from £18.00, C2N from £7.00,
printers, disc, etc. for more details write
or tel: G. C. Bunce & Son, 36 Burlington
Road, Burnham, Bucks. SL1-7BQ. Tel:
(06286) 61696.

QL SOFTWARE on microdrive games 1 £8.50; Chess, Fruit Machine, Lunar Lander + 4 more. Games 2 £9.00; Snooker Manager, Glidpath, Bombshell, Mazeman, Expert, Eldorado, NIM. £5.00 off if microdrive supplied. Rodent Software 3 Brookend Drive, Henley W. Midlands B95 5JA.

COURSES

★ 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

DUPLICATION

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
P1, FREEPOST, 46 WESTEND, LAUNTON, OXON OX8 612

jbs records

COMPUTER PROGRAMS

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

"DATATAPES" for highest quality blanks and data duplication, call now for a sample quote. You will find us VERY competitive. The Midland Railway Grain Warehouse, No 2, Derby St, Burton Upon Trent, Staffs. (0283) 38199.

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.

EXHIBITIONS

MICRO COMPUTER EXHIBITION

SAT. JAN. 12th 1985

THE GREAT HALL,
CIVIC CENTRE,
BROMLEY, KENT
INFO: EAST-WEST
TEL: 01-290 5299

THE NEWBRAIN FILES
ALL YOU NEED TO KNOW ABOUT THE NEWBRAIN £9.50 PUBLISHED JANUARY '85
VITAGRAPH LTD, 26 COLLEGE ROAD
BROMLEY, KENT BR1 3PE

BOOKS

COMPUTER BOOK SPECIALIST!
Electron, Spectrum, Oric. S.A.E. for lists. D. A. Armstrong, 30 Octavia Street, Kircaldy, KY2 5HH. Fife, Scotland.

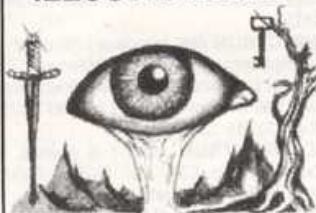
SOFTWARE

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, Freeport, Windmill Hill, Brixham, TQ5 9BR. Tel: 080 45 55532.

SECOND OPINION complex decision maker £5. Cosmic Influence Analyser £5. Tunewriter (for the non-musician) £5. Or send £1 for list of unusual programs for the SPECTRUM. C.C.S., 13 Walton Crescent, Llandudno Junction, Gwynedd.

ILLUSTRATIONS

COMPUTER ILLUSTRATIONS



01 305 0470
01 771 4954

RECRUITMENT

!! PROGRAMMERS !!

Programs urgently required, cash advances paid. We pay all production and advertising costs. For instant attention without obligations, send copy and instructions or write for further details. Independent Software, Goldstar House, 198-200 Queenswood Drive, Leeds 6 LS6 3ND.

FREELANCE PROGRAMMERS

Freelance Assembler Programmers required for the AMSTRAD CPC464 to work from home. Write in the first instance to:

WESSEX SOFTWARE,
25 Shapway Rd, Evercreech,
Somerset BA4 6JT

AMSTRAD

AMSTRAD

* Vortex
Our powerful, but easy to use full feature word-processor £7.95 (inc. p&p)

* Card index — our best-selling Databases. Sort, Search, Find your data as you require. Comprehensive printing facility. £5.95 (inc. p&p)

* 3-in-1 games tape:
Viking Dig/Shootout/Porton Deluxe. Xmas special — all 3 for £4.95.

* Simple maths.
Maths tutor program to help younger children; colourful and encouraging. £5.95.

S.A.E. for details. Cn-POs to:
Viking Software, 10 Russell St,
York YO2 1NW.

* Have a happy Xmas with Viking Software!

SOFTWARE FOR YOUR

AMSTRAD AMSOFT GAMES

CHESS ROLAND IN CAVE HARRIER ATTACK
CUBIT ROLAND IN TIME CRAZY GOLF
PUNCHY ELECTRIC FREDDY GEMS
STRADUS ALIEN BREAKIN SULTANS MAZE
GP DRIVER LASER WARP HUNTER KILLER
SPANNER MAN

ONLY £7.00 EACH

GUIDE TO BASIC 1 £15.00 SPREAD-
SHEET £15.00 WORD-PROCESSING £8.00
HOME BUDGET £15.00 DEVPAC ASSEMBLER
£20.00

AMSTRAD JOYSTICK ONLY £9.95

P&P PLEASE ADD 25p PER ORDER

COs/POs TO M.J.C. SUPPLIES

"SCOJA", LONDON ROAD, HITCHIN

HERTS SG4 5EN

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, 176, TOD-MORDEN ROAD, BURNLEY, LANCs. BB11 3EU.

MODEM III NOW COMPATIBLE WITH AMSTRAD GREEN SCREEN MODEL FOR USE WITH COLOUR T.V.

SEE ACCESSORIES

AMSTRAD

THE TOMB OF KUSLAK

Graphic strategic adventure. 225 locations, 5 levels. Fight goblins, get, use, and drop objects. Rescue 4 treasures. Variable difficulty, different set-up each game.

£3.00

D MUIR, 78 Peverell Park Rd., Plymouth.

Tel: Ply 265 142

CLUBS

AMSTRAD

AMSTRAD OWNERS

Join a dedicated Amstrad club. Join 'Amstrad'. Look what we offer: Monthly tape magazine news, reviews, competitions etc. Software/Hardware discounts. Exchange club (originals only)

Send cheque/P.O. for £3 to:

AMSCUB

42 Mount Stewart Street, Carlisle, Lanarkshire
Your membership kit and first tape magazine will be sent to you by return of post.

MAGAZINES



DRAGON USER

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

WANTED

SPECTRUM 16/48K games wanted (originals) top 50, £2+ paid; + old classics £1.50 + offered. Send lists "Martin" 13 Naunton Crescent, Cheltenham.

WANTED — ORIGINAL BASIC PROGRAMS FOR AMSTRAD CPC464

Yes that's right, basic programs! We are not looking for mvc masterpieces, so don't send any. Just the sort of programs you'd find printed in a magazine.

All those accepted will be included on one of a number of multipart tapes to be realised soon. We pay royalties/cash, so send in as many as you like — we need them urgently. Confidence assured.

Send tapes to:

Amstrad Basic Programs (PCW3),
Egerton Road South, Chorlton,
Manchester M21 1YP

We will reply with our offer within a week.

WRITTEN ANY USEFUL Q.L. PROGRAMS?

Contact: DIRAN

At Viglen Computer

Supplies,

Unit 7, Trumpers Way,
Hanwell, London W7 2QA.

Royalties paid for all marketed software.

WE NEED YOU!

Sinclair Spectrum, CBM 64 and Amstrad machine-code programmers. All types of work.

Short machine-code programs; Arcade, Adventure and Educational games. Please send examples of your work.

Contact the software manager:

Parkway Group,

42, Gloucester Crescent,

Camden Town,

London NW1 7DL

MAKE YOUR PROGRAMS MAKE MONEY!

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

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.

WANTED: artistic Spectrum owners to produce graphic screens for adventure games. Use our own compiled graphics language. Spare time earnings. S.A.E for details: Keysoft, 6 Bruce Grove, Tottenham, London, N17 6RA.

THIS SPACE FOR SALE

£18

TELEPHONE:

PCW CLASSIFIED

01-437 4343 Ext 206

FOR SALE

TANDY for sale: TRS 80 Coco business system 16K computer, disk drive DMP200 printer, colour TV. WP. Spreadsheet + filing software. Excellent condition £1,000 worth for £350. Tel. Reading 869312.

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

SIMON STABLE PROMOTIONS CASSETTE DUPLICATION

46 West End, Launton, Oxon OX6 0DG
Tel: 0869 25 2831

VAT No. 336 2323 79

AUDIO/DATA ESTABLISHED 1970

"A Merry Christmas & A Fruitful New Year
to all our customers, Past, Present & Future!"
"Special Xmas offer! — 50 DS/SD discs @ £65 p/p & VAT inclusive!"

POPULAR Computing WEEKLY

Back Issues

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

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

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

Total £

Please send me a copy of the 1983 PCW Index at £1.20 ☐
I enclose a cheque postal order for £

Name

Address

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

PRINTER BARGAINS

JUST PLUG IN AND GO

INTERFACE/CABLE VAT & CARR. INCLUDED

	QL	BBC	Spec	Vic
Seikosha GP50A/S 40cps 40 column	129	109	99	135
Seikosha GP100A/AS/VC 30-50cps	169	169	169	149
Seikosha GP700A 7 Colour 50cps	365	347	365	370
Shinwa GBA80 New 100cps Friction/Tract.	248	228	248	258
Canon PW1080A 160cps-Draft 27 cps-NLQ	359	345	359	368
Smith Corona TPI Daisywheel 12cps	219	219	219	235
Daisy Step 2000 18cps Daisy Wheel	295	275	295	—
Mannismann Tally MT80 80cps	250	230	250	258
Kaga Taxan KP810 160cps, NLQ	349	335	349	358
CUB Microvitec, new for the Q.L. Matching black — 85 columns — 14" 653x585 pixels. Special low price £259 (cable included).				
Q.L. serial cable £12.00. Q.L. Parallel interface cable £39.00.				

STRONG COMPUTER SYSTEMS

Bryn Cottage, Peniel, Carmarthen, Dyfed
Telephone: 0267 231246 for further information

SIMPLY CHEAPEST SOFTWARE CHECK THESE PRICES

OUR		OUR		OUR		OUR	
SPECTRUM	RRP PRICE	SPECTRUM	RRP PRICE	COMMODORE	RRP PRICE	COMMODORE	RRP PRICE
EUREKA	14.95 10.99	DALEY'S DECATH	6.90 5.20	KONG STRIKES BACK	7.95 5.79	KOKO TONI WILF	6.95 5.24
BACKPACKERS	7.50 5.55	ALL ULTIMATE GAMES	9.95 7.36	GHOSTBUSTERS	10.99 8.25	BOYLDER DASH	8.95 6.64
SKOOL DAZE	5.95 4.45	LOAD RUNNER	9.95 7.36	RAID OVER MOSCOW	9.95 7.50	STAFF OF KARNATH	9.95 7.36
FALL GUYS	6.95 5.05	AVALON	7.95 5.94	SUICIDE EXPRESS	7.95 6.25	MY CHESS II	11.95 8.95
TIR NA NOG	9.95 6.88	ZOMBIE ZOMBIE	6.95 5.21	DRELBS	9.95 7.50	PYJAMARAMA	7.95 6.25
BRAX BLUFF	6.95 5.21	SON OF BLAGGER	5.95 4.35	COMBAT LYNX	8.95 6.75	ALIEN	9.95 7.36
DANGER MOUSE	6.95 5.21	DARK STAR	7.50 5.61	JET SET WILLY	7.95 5.74	BBC	
CYCLONE	6.95 4.96	MATCH POINT	7.95 5.93	FLAK	9.95 7.50		
POTTY PIDGEON	6.95 4.96	BOULDER DASH	7.95 5.79	WING COMMANDER	7.95 5.95		
CHALL.	6.95 5.21	PSYTRON	7.95 5.93	FORT APOCALYPSE	9.95 7.50		
JASPER	6.95 5.21	TORNADO LOW LEVEL	5.95 4.50	SPITFIRE ACE	9.95 7.50	WHITE KNIGHT MARK II	11.50 8.35
PYJAMARAMA	6.95 5.21	DEUS EX MACHINA	15.00 11.00	ZAXXON	9.95 7.50	ELITE	14.95 10.90
ALL LEVELS 9 GAMES	9.95 7.36	START BIKE	6.95 5.05	SPIRIT OF THE STONES	14.95 11.25	AVIATOR	14.95 10.94
PITFALL II	8.99 6.52	KUNG FU	6.95 5.05	STRIP POKER	9.95 7.50	RETURN TO EDEN	9.95 7.36
KOKO TONI WILF	5.95 4.50	HYPER ACTION	5.95 4.55	BRUCE LEE	9.95 7.50	POLE POSITION	9.99 8.54
BEACH HEAD	7.95 5.90			SUMMER GAMES	14.95 10.94	SABRE WOLF	9.95 7.21

ALL TAPES GUARANTEED GENUINE: FIRST CLASS DELIVERY SAME DAY AS ORDER RECEIVED

P.&P. INC. IN PRICE UK: 75p PER TAPE EUROPE: £1 PER TAPE ELSEWHERE

SEND LARGE SAE FOR FULL LIST (state machine)

WHEN ORDERING SEND CHEQUE/P.O. TO:

BARGAIN SOFTWARE

10 MELODY COURT, STONEHILL ROAD ESTATE, LONDON W4 3AW

TEL: (01) 995 2763

(suit Epson etc...) Manual + programs £200 Tel: 03677 229.

CASIO PB700 portable computer 32K ROM, 16K RAM. Brand new with case, two instruction manuals, Nicad rechargeable batteries. (Four Colour printer plus cassette available) costs £200. Accept £130 Phone 01-527 5493.

TRS-80 Model 100 portable 24K Ram including program recorder 2 months old. £450 Brighton 6795351.

FOR SALE Burger time + Heroes of Kahn by Interceptor. Sell for £3.50 each or £6.00 for the two. Phone: Dave 021-777 5023.

STICKY LABELS Tractor feed 3 1/2 x 1 1/2 inches one wide ideal for Christmas cards 70p per 96 ncl p & p. Tel: 0536771 363 after 5pm please.

SAGA EMPEROR keyboard with soundboost and flexible for Spectrum. 67 keys. Easy fitting. Brand new! Cost over £75. Sold my Spectrum 50 now unwanted. Only £50 ono. Phone Bookham 56327.

SHARP MZ80K - 48K computer. Built in monitor and cassette. Sharp Pascal and Basic. Games. Excellent condition. Phone Billericay, Essex (02774) 22117 weekends or after 8pm weekdays £200. Offers considered.

SILVER REED EX44 electronic typewriter - 10/12/15 chars/inch daisywheel + IF44 Centronics interface + 3 extra daisywheels. Some ribbons. £400 new, now 1 year old: sell £290. Tel: 0742 (Sheffield) 662313.

LYNX 48K computer, complete with all leads, manuals, and demo. Tape. Rarely used, still boxed and in excellent condition. Sell for £95. Tel: Lea Valley (0992) 768401 after 6.00.

FREE SNOOKER TABLE 4' by 2' with cues etc for first person to buy either my Currah Speech, my software bundle, or my Walkman detachable speakers, radio thingy (£60 new) or all. Phone 699 7093.

FOR SALE Alphacom 32 printer, brand new £50 o.n.o. Also DKTronks double joystick £10. Plus Spectrum software for sale. Ring 01-203-0329 after 6pm.

MONITOR FOR SALE. Microvitec Cub model 1451, for Acorn, BBC or Electron RGB medium res new in July, little used. £270. Also software at half price. Basingstoke 51623.

LOOK! Intellivision £55. Cartridges £10 ono. Vectrex video game £60. Spike cartridge £10. Acetronic cartridges £5-8. All cartridges include postage. Everything has original packaging and in excellent condition. Tel: 01-802 8724

SHARP MZ80K 48K Ram integral cassette and monitor + printer interface (suit Epson etc.) manual + programs £200. Tel: 03677 229.

MATTEL INTELLIVISION console, complete, in original box. 3 Rom based game with all instruction. £50. Tel: 01-577 2839.

SIMONS BASIC only £6. Also speech synth for CBM64 only £4. Bargains not to be missed, ring 021-742 6334.

ZENITH SCREEN MONITOR for apple. As new, boxed £80. Tel: 037 284 2926.

Q.L. (all versions) Q club membership, Quill, Abacus, Archive and easel. Hardly used & mags. £395. Tel: Rochdale (0706) 54482.

OKI MICROLINE 82A Dot matrix printer 120cps, block graphics, ten character sets, serial and parallel interfaces. Excellent condition, complete with lead £150 ono. Tel: (0789) 68080.

Wanted

WANTED SINCLAIR ZX80 in good condition, old or new Rom and software. Phone: 051 531 7092.

WANTED MEMOTECH 512 or 500 or BBC 'B' 1.2 OS or Atari 800 & disk drive. Will pay fair price. Tel: 0254 29640 after

4.30 pm weekday; anytime weekend.
WANTED SPEECH SYNTH for Vic-20 around £20 to £25 urgently required. M. Croft 33 Kirkes Road, Moorlands, Lancaster, Lancs.

SWAP CURRAH MICRO speech for interface two & joystick or microdrive without interface. Wanted intellivision games console & games. Tel: Blackpool 63443, anytime.

WANTED JUPITER ACE with 16K Rom, will pay up to £20.00. Tel: 061 652 7230 after 4 pm.

WANTED CBM Disk Drive 1541, in exchange for Spectrum 48k or sell for £130. Tel: Maidstone (0622) 55861.

SWAP SEMI PROFESSIONAL Cassette deck (cost £450) and amplifier (cost £140) both unused for computer + extras worth £250+ (CBM64 or Amstrad preferred) or sell £300 ono. 01-863 5113 ask for Deepak.

WANTED: DIGITAL TO ANALOGUE converter board for Spectrum. Must have two channels or more. Will pay up to £30, also wanted: Currah speech unit. Phone Andrew on Bookham 56327.

SWAP SPECTRUM 48K with keyboard, dual joystick interface, joysticks, reliable cassette deck, currah speech, £300 software, books worth £50, mags for CBM64 + C2n, or Amstrad both + extras sell £250. 01-863 5113.

SWAP SNOOKER TABLE 6 x 3, with pool balls and cues for Spectrum. Can't deliver. Southend-on-sea 0702 540452, ask for Paul.

SWAP Atari 600XL and recorder for Spectrum 48K or sell for £95 ono. Oxford if possible. Readvertised due to timewaster. Apply 393 Pegasus Court, Blackbird Leys, Oxford. Ask for Paul.

SPECTRUM programmable interface, (not used). Swap for switchable of Kempston type interface or plus four original games for Currah micro speech. Please phone Hinckley 614597 - Evenings.

PEN PAL wantEd to exchange ideas magazines etc on BBC hardware and software. Write to Carmel Delicata 195 Tower Road, Silema Malta Tel: 010-356-511252. All correspondence answered. Software purchases considered.

WANTED programmers to convert Spectrum program currently on market to Vic-20, Dragon etc. 50% of sales given. Write to S. Johnson, 78 Nairn Street, Crookes, Sheffield S10 1UN or phone (0742) 661671

SWA- CBM 64 software to the value (Superbase, Easyfile, Easystock, Vizawrite, Petspeed, Paperclip, Dallas, Alice, Scrabble, Musicalc, etc. - long list) for 1701 Colour monitor or 1520 Printer/plotter: phone 0702 529431

SWAP Apple ITT, 48K + disk drive, + W/P s/w for Dragon 64 + disk drive + OS/2flex or offers. Tel: Ted, 01-673 7877 (eves.)

WANTED 48K Spectrum, also peripherals interface one, TVX 5000 modem, write D. Black 5 Swan Court, Birkenhead, M'side.

SWAP stereo record player, excellent cond. for Commodore 1520 printer plotter reqd, urgently must be in gd. cond. boxed with instructions if possible. Tel: Hornchurch 45284 after 7pm.

I WILL swap my C.B. with S.W.R. meter, power pack, and TW19 for a colour monitor for a Spectrum or accessories. Tel: Fauldhouse after 4pm weekdays only no. 71524.

LOOK!! swap my Atmos 48K, joystick, interface, software, books, J.V.C. mini TV radio cassette (cassette compatible) and 16K ZX81 + Software, books for Amstrad CPC464, genuine reason tel. Jerry 531 6480 (01).

ADVENTURE HELPLINE

Fantasia Diamond on Spectrum. How do I get across the river? Tony Slater, Flat 3, 87 Dunsmore Road, London N19.

Ghost Town on Atari. I cannot shoe the horse - I don't have the nails, and I can't open the safe with the gunpowder. Can anyone help? Chris Oakes, 62 Ashenground Road, Haywards Heath, West Sussex.

Twin Kingdom Valley on BBC. How do I get the master key from the dragon without getting burned to death? H Kulbick, 167 Duncan Road, Aylestone, Leicester.

Ship of Doom on Spectrum. How do you get the key from under the glass cover in the key room? Martin Parker, la Craie Avenue, Scartho, Grimsby, S Humberside.

The Castle on Spectrum. How do you get out of the chasm? Donald M Mackay, 2 Stewart Drive, Stormway, Isle of Lewis, Scotland.

Zork's Kingdom on Vic20. I cannot get past the pit. Mrs C Fuller, 83 Hill Grove, Salendine Nook, Huddersfield, W Yorks.

Keys of the Wizard on Dragon. I'm one treasure short - I can't open all the chests but I can kill the jester. P Hampson, 10 Cherry Lane, Lawton Heath, Alsager, Stoke-on-Trent, Staffs.

Hobbit on Spectrum. Where do I go after crossing the fast black river in the wooden boat? I can't get beyond the elvish clearing. Phillip Shooter, 127 Green Farm Close, Loundsley Green, Chesterfield, Derbyshire.

Voodoo Castle on Vic20. How do you go through the crack in the wall? Please help! Geoffrey Bear-dsell, 348 Central Park Road, East Ham, London E6.

Twin Kingdom Valley on Commodore 64. How do you get the master key of the dragon, in the north tower of the Desert Castle? Mark Woolway, 17 Bertram Drive, Meols, Wirral, Merseyside.

Velnor's Lair on Spectrum. Where are the oars for the bathtub? Chris Taubert, 136 Western Avenue, Dagenham, E Essex.

Hobbit on Spectrum. How do I kill the monstrous dragon, once I have got the treasure? M Bird, 35 Ashley Close, Pewsey, Wilts.

The Hulk on Commodore 64. How do I lift the ring? How do I get the wax? How do I get the big gem? Keith Willis, 2 Leicester Close, Hadrian Lodge, Newcastle-upon-Tyne, Wallsend, Tyne-and-Wear.

Pimania on Spectrum. What is the significance of the red fish? Mark Lambert, 3 Mere Farm Grove, Oxtou, Birkenhead.

Mystery of Monroe Manor on Commodore 64. How do I open the wardrobe? P A Taylor, 167 Uplands Road, West Moors, Wimborne, Dorset.



Order us about...

HURRY!
Order before the end of this year and claim a special £1 discount...

Here's how to get a pristine copy of Popular Computing Weekly, delivered by a uniformed representative of Her Majesty's Post Office, every week for a year. Or, if you're watching the pennies, for six months.

Normally, it only costs £19.95 to get first-class delivery of your first choice magazine for a full twelve months, and a measly £9.98 for half a years worth of Popular Computing Weekly, weekly.

But if you order before this year comes to an end - that is by December 31 - then we'll reduce the cost of a full year's sub by a further 100 pence to a low, low £18.95.

Order your PCW subscription on this special order form, now.

about 50 times a year.

Popular Computing Weekly First Class Subscriptions Order

Please reserve me a subscription to Popular Computing Weekly for:

☐ 12 months at £19.95 - now only £18.95 if you order before 1989!

☐ 6 months at £9.98.

Overseas Orders:

☐ 12 months for £37.40 - now only £36.40 if you order before 1989!

☐ 6 months for £18.70.

Payment Methods:

☐ I enclose a Cheque/Postal Order payable to Sunshine Publications.

☐ Please charge my credit card ☐ Access ☐ Barclaycard

Number _____

Expires on _____

Signed _____

Name _____

Address _____

Send to: Popular Computing Weekly Subscriptions, 12-13 Little Newport Street, London WC2R 3LD

Amstrad

1	(-) Marie Miner (Software Projects)
2	(-) Hunchback (Ocean)
3	(-) Classic Adventure (Amiga)
4	(-) Classic Adventure (Amiga)
5	(-) Classic Adventure (Amiga)
6	(-) Classic Adventure (Amiga)
7	(-) Classic Adventure (Amiga)
8	(-) Classic Adventure (Amiga)
9	(-) Classic Adventure (Amiga)
10	(-) Classic Adventure (Amiga)

(Figures compiled by Boots/Websters)

Amstrad

1	(-) Marie Miner (Software Projects)
2	(-) Hunchback (Ocean)
3	(-) Classic Adventure (Amiga)
4	(-) Classic Adventure (Amiga)
5	(-) Classic Adventure (Amiga)
6	(-) Classic Adventure (Amiga)
7	(-) Classic Adventure (Amiga)
8	(-) Classic Adventure (Amiga)
9	(-) Classic Adventure (Amiga)
10	(-) Classic Adventure (Amiga)

(Figures compiled by Boots/Websters)

BBC

1	(-) Marie Miner (Software Projects)
2	(-) Hunchback (Ocean)
3	(-) Classic Adventure (Amiga)
4	(-) Classic Adventure (Amiga)
5	(-) Classic Adventure (Amiga)
6	(-) Classic Adventure (Amiga)
7	(-) Classic Adventure (Amiga)
8	(-) Classic Adventure (Amiga)
9	(-) Classic Adventure (Amiga)
10	(-) Classic Adventure (Amiga)

(Figures compiled by Boots/Websters)

Dragon 32

1	(-) Marie Miner (Software Projects)
2	(-) Hunchback (Ocean)
3	(-) Classic Adventure (Amiga)
4	(-) Classic Adventure (Amiga)
5	(-) Classic Adventure (Amiga)
6	(-) Classic Adventure (Amiga)
7	(-) Classic Adventure (Amiga)
8	(-) Classic Adventure (Amiga)
9	(-) Classic Adventure (Amiga)
10	(-) Classic Adventure (Amiga)

(Figures compiled by Boots/Websters)

Spectrum

1	(-) Marie Miner (Software Projects)
2	(-) Hunchback (Ocean)
3	(-) Classic Adventure (Amiga)
4	(-) Classic Adventure (Amiga)
5	(-) Classic Adventure (Amiga)
6	(-) Classic Adventure (Amiga)
7	(-) Classic Adventure (Amiga)
8	(-) Classic Adventure (Amiga)
9	(-) Classic Adventure (Amiga)
10	(-) Classic Adventure (Amiga)

(Figures compiled by Boots/Websters)

Commodore 64

1	(-) Marie Miner (Software Projects)
2	(-) Hunchback (Ocean)
3	(-) Classic Adventure (Amiga)
4	(-) Classic Adventure (Amiga)
5	(-) Classic Adventure (Amiga)
6	(-) Classic Adventure (Amiga)
7	(-) Classic Adventure (Amiga)
8	(-) Classic Adventure (Amiga)
9	(-) Classic Adventure (Amiga)
10	(-) Classic Adventure (Amiga)

(Figures compiled by Boots/Websters)

Vic 20

1	(-) Marie Miner (Software Projects)
2	(-) Hunchback (Ocean)
3	(-) Classic Adventure (Amiga)
4	(-) Classic Adventure (Amiga)
5	(-) Classic Adventure (Amiga)
6	(-) Classic Adventure (Amiga)
7	(-) Classic Adventure (Amiga)
8	(-) Classic Adventure (Amiga)
9	(-) Classic Adventure (Amiga)
10	(-) Classic Adventure (Amiga)

(Figures compiled by Boots/Websters)

Top 10

Now voting on Week 4 — £100 to win

Week 2: No winner — £50 added to Week 4 chart fund

1	(1) Daley Thomson's Decathlon (Spectrum/C64)
2	(6) Beach Head (C64)
3	(4) Underworld (Spectrum)
4	(3) Elite (BBC/Electron)
5	(-) Kokotoni Will (Spectrum/C64)
6	(2) Danger Mouse in Double Trouble (Spectrum/C64)
7	(-) Knight Lore (Spectrum)
8	(-) Sherlock (Spectrum/C64)
9	(5) Pyramarara (Spectrum/C64/Amstrad)
10	(8) Deus ex Machina (Spectrum)

Ocean
US Gold
Ultimate
Acornsoft
Elite
Creative Sparks
Ultimate
Melbourne House
Mikro-Cen
Automata

Readers' Chart No 2

Event	Dates	Venue	Admission	Organisers
Which Computer? Show (over 18s only)	Jan 15-17 (1985) 10.00am-5.00pm 10.00am-4.00pm	NEC Birmingham	Free in advance from organisers	Capp and Pollak 01-891 5051
Hi-Tech and Computers in Education Exhibition	Trade: Jan 24 10.00am-1.00pm Educational: Jan 24 1.00pm-8.00pm Jan 25 11.00am-8.00pm Public: Jan 26 11.00am-6.00pm	Barbican London EC2	Free in advance from organisers	Computer Marketplace 01-930 1612
Apriol and Sirius Computer Show	Feb 5-7 10.00am-6.00pm	Kensington Town Hall London W8	Free in advance from organisers	Paradox 01-241 2354
The LET '85 International Trade Show	Feb 17-18 10.00am-6.00pm Feb 19 10.00am-4.00pm	Olympia 2 London W6	Free in advance from organisers	Turner-Whitland 0823 77000

Diary

All you have to do to vote is to fill in the form below with the names of your current three favourite software titles (or copy the form on to another sheet if you don't want to damage your magazine) and send it off as soon as possible to: Top 10, Popular Computing Weekly, 12-13 Little Newport Street, London WC2H 7PP. We will send £50 each week to the person who correctly predicts that week's top three. If there is no winner then that week's prize is automatically added to the chart on which voting is currently taking place, 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.)

Voting for Week 4 closes at 2pm on Wednesday December 12. Entries received after that time will not be eligible for inclusion in that week's voting.

Name.....

Address.....

My top 3: Voting Week 4

3

2

1

New Releases

HAIL CAESAR

Caesar the Cat was one of the most enchanting programs I've seen (maybe I just like cats) but I later found out that it was basically intended for young children. Oh well. *Caesar's Travels* is definitely for a young market and is obviously intended to be somewhat educational — it's the computer equivalent of bedtime stories.

The story begins with Caesar the Cat in his larder trying to rid it of mice (see previous program), failing, and being chucked unceremoniously into the yard. From then on you can alter the story by a simple choice of keys at each point. For example, in one section you must decide whether to hide in a bin or run away.

Depending on the choices you make at each point, a different story is followed. Some end with Caesar in a pretty sorry state, others with him safely tucked away in a warm home. Here and there in the program there are sections where you must answer some

simple questions to further the adventure.

The graphics are charming with excellent sound effects (Caesar's purr positively glows with pleasure, his plaintive mew is truly heart-tugging). With a wide variety of possible stories the program should last quite a while before it becomes repetitive. I think if you have children under ten, they should be transfixed by this one and I might add that I was, too.

Program *Caesar's Travels*
Price £7.95
Micro Commodore 64
Supplier Mirrorsoft
Holborn Circus
London EC1P 1DQ

BLACK GOLD

All of Sinclair's recent releases have been educational and many of them have been produced by Macmillan. *Oil Strike* is your big chance to run a multinational company and seek oil.

The main section of the program concerns getting surveys on likely looking areas of rock and trying to deduce from the available visual evidence of rock type and structure whether an oil strike is likely.

As you develop more and more strikes, so the world situation develops, boosting or hampering your expansion. You must adjust the rate of production at each oil well in accordance with world market conditions.

The program combines marketing and financial strategy with simple geology as you take risks and try to maximise profits. One of those rare edu-



cational programs that the pupils should like as much as the teachers.

Program *Oil Strike*
Price £9.95
Micro Spectrum
Supplier Sinclair Research
Stanhope Road
Camberley
Surrey GU15 3PS

BUTTERFLIES

Paddington's Garden Game is a machine code collect and dodge whose only distinguishing feature is that it features a main character that looks vaguely like the famous bear. Also, marmalade sandwiches feature somewhere in the plot.

The idea is to move Paddington around a garden collecting butterflies (surely an environmentally unsound act?) and dodging various other objects like hedgehogs and wasps. The garden extends to several screens of a fairly simple kind livened up with the occasional

pond and fountain.

The sandwich lurks somewhere in the garden and gives Paddington bonus points if he can find it. It's OK and little children who are already Paddington addicts may enjoy it, but, honestly, other than the bear it's really nothing special.

Program *Paddington's Garden Game*
Price £6.95
Micro Commodore 64
Supplier Collins Soft
8 Grafton Street
London W1X 3LA

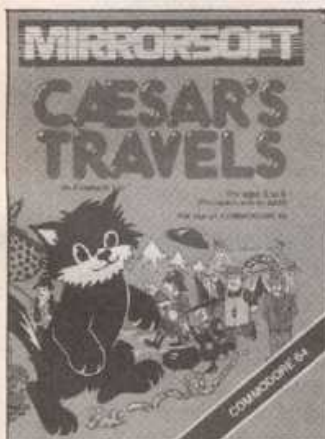
CLEAN UP

Every so often I get programs sent in from readers, most of which are usually dire and are discreetly ignored. But *Litter Bug* from Solsoft is actually pretty good.

Briefly, the plot is to move a little space creature around a scrolling screen collecting rubbish bags and returning them to an incinerator. The screen is full of various sorts of rubbish, some of which is radioactive and must be quickly blasted before it explodes.

The graphics are smooth scrolling sprites and the sound is pretty good too; all in all a perfectly good game. The only problem is the whole thing looks incredibly like an early Ultimate game, so minus marks for originality. Nevertheless, there are worse ways of spending £4.95.

Program *Litter Bug*
Price £4.95
Micro Spectrum
Supplier Solsoft
2 Huntly Road
Liverpool L6 3AJ



This Week

Program	Type	Micro	Price	Supplier
Number 11	S	Amstrad	£5.50	Camel
Assembler	Ut	Amstrad	£11.60	Amor
Flex Friend	Ut	Amstrad	£7.50	Camel
Grasp	Ut	Amstrad	£8.50	Camel
Toolbox	Ut	Amstrad	£4.95	Camel
Holy Horrors	Ad	BBC	£6.99	Romik
The Land of Chark	Ad	BBC	£4.95	Delta 4
Spooky Manor	Ed	BBC	£9.95	Acornsoft

Workshop	Ed	BBC	Price	Supplier
Pottit	Arc	C16	£9.95	Acornsoft
Allard's Tome	Ad	Commodore 64	£6.99	Romik
Animal Magic	Ad	Commodore 64	£6.99	Romik
Tristan and Isolde	Ad	Commodore 64	£8.95	CRL
Blaze	Arc	Commodore 64	£6.99	Romik
Demons of Topaz	Arc	Commodore 64	£5.95	Firebird
Motocross	Arc	Commodore 64	£7.95	System 3
Paddington's Garden	Arc	Commodore 64	£6.95	Collins Soft

Pick of
the week

FROG STEW

Mikro Gen's programs have been getting better and better recently — the graphics have got bigger, the games design have improved markedly. The techniques which have improved the arcade games so much have now been introduced to create a graphics adventure with some of the most impressive illustrations yet seen.

The Witches Cauldron not only features excellent graphics, but has an unusual and entertaining plot. You have been transformed by the kind of magic that is part of the standard kit in adventure games, into a frog and must transform yourself, stage by stage through virtually every kind of intermediate animal until you arrive back to your human state.

You actually appear on the

screen as the animal you currently are; one interesting feature of the plot is that your choices within the adventure are limited by what animal you are. There are riddles to be solved in return for help, a nice new character set and intelligent use of colour not only in the graphics, but in the text itself.

It's cute rather than macho with a lot of humour, but fiendish enough for all that. It understands pretty complicated sentences and kept me entertained for hours. What more do you want?

Program *The Witches Cauldron*
Price £6.95
Micro Spectrum
Supplier Mikro-Gen
44 The Broadway
Bracknell
Berks

blurb says that the game has five separate game screens this is true, but really it is only the same idea represented in different ways — in this respect it is a bit like life or *Finnegans Wake* for that matter.

And so the idea on which it all hinges — you are a bartender (the bartender or publican is apparently known as a Tapper in America from whence this program comes — isn't English a funny language?) who must serve a mob of unruly customers, all of whom demand instant service and none of whom pay for their drinks — a bit like our office party ac-

tually.

Your barman must rush about from customer to customer serving their drinks before they overrun the bar. Not only this, but empty glasses are returned by being slid back across the bar top, you have to be there to catch them and return a full glass.

So it's a running about, dodging back and forth at ever greater speed, keeping your eyes open for customers and glasses type of game, and either that's enough or it isn't.

Program *Tapper*
Price £9.95
Micro Commodore 64

Supplier US Gold
Unit 10
Parkway Industrial
Centre
Heneage Street
Birmingham B7 4LY

SUPER FUN

In *Demons of Topaz*, the idea is that you are a spaceman and you must collect legendary sacred crystals from the demon guardians. The way through the many passages to each crystal is difficult and requires much pondering of pace and jumps — watch out if you fall because your little spaceman will crash to earth with decidedly nasty bump! (Hang on a minute, I seem to have written this before somewhere.)

Anyway, it's absolutely fantastic the way you can go through all these screens of action with different problems to be solved on each one (hang on, I'm getting confused — what month is this, what year?). Can you figure out how to get from platform to platform and collect the sacred crystals (I

keep seeing this mine with penguins and kangaroos and keys you have to collect).

What amazingly exciting fun it all is! Aren't you glad you are in such an innovative, razor's edge of technology-type industry?

Program *Demons of Topaz*
Price £8.95
Micro Commodore 64
Supplier Firebird Software
Wellington House
Upper St Martin's Lane
London WC2H 9DL

ROLLS ROYCE

The Expert Sprite Editor is the Rolls Royce of sprite editors, of which there are many for the Commodore 64.

Anything you want for the design of sprites is there, well documented and with all the additional information about using the sprites from Basic you could wish. Expensive but good.

Program *Expert Sprite Editor*
Price £8.95
Micro Commodore 64
Supplier Android Dreams
94 Rednall Road
Kings Morton
Birmingham B38 8DU

Compiled by Graham Taylor

New Releases is designed to let people know what software is coming on the market. If you have a new game or utility which you are about to release send a copy and accompanying details to: New Releases, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.



This Week

Acornsoft, Betjeman House, 104 Hills Rd, Cambridge CB2 1LQ
Arnor, 76 Isham Road, London, SW16 4TF **CRL**, CRL House, 9 Kings Yard, Carpenter's Road, London E15 2HD, 01 533 2918
Cheetahsoft, 24 Ray Street, London, EC1R 3DJ, 01 833 4909
Camel, Wellpark, Willeys Ave, Exeter EX2 8BE, 0392 211892
Century City, 99 High Street, Dudley West, Midlands DY1 1QP, 0384 57077
Collins Soft, 8 Grafton Street, London W1X 3LA, 01 493 7070
Delta 4, The Shieling, New Road, Swanmore, Hants SO3 9PE, 04893 5800
Eclipse, 79 Ardrossen Gardens, Worcester Park, Surrey, KT4 7AX, 01 330 3116
Firebird, Wellington House, Upper St Martin's Lane, London WC2H 9DL, 01 379 6755
Impsoft, 149 Balham Hill, London SW12, 01 675 5577
Kuma, Kuma Computers, 12 Horseshoe Park, Pangbourne, RG8 7JW, 07357 4335
Megatron, 22 Mountfield Gardens, Kenton, Newcastle upon

Tyne, NE3 3DB, 091 285 1721
Microdeal, 41 Truro Road, St Austell, Cornwall, PL25 5JE, 0726 73456
Mirrorsoft, Mirror Group, Holborn Circus, London EC1P 1DQ, 01 353 0246
Real Time, Prospect House, 32 Sovereign Street, Leeds LS1 4BJ, 0532 458948
Romik, 272 Argyll Avenue, Slough, SL1 4HE, 0753 71535
Solsoft, 2 Hurlly Road, Liverpool L63AJ, 0532 458948
System 3, 138 Carlton Avenue, East Wembley, Middlesex, 01 835 3593
US Gold, US Gold, Unit 10 The Parkway Ind Centre, Heneage Street, Birmingham B7 4LY, 021 359 3020.

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.

Puzzle

Ziggurat

For what seems like years I've been listening to software companies discussing the problem of how to find people who pirate tapes — and various suggestions of what to do

screen, displaying a series of numbers and symbols. The screen is divided into two main sections. The top section displays a large, stylized number '1' in the center, with the words '1000' and '1000' on either side. The bottom section displays a large, stylized number '2' in the center, with the words '1000' and '1000' on either side. The screen is surrounded by a black border.

to read, conveys a subliminal message straight into the deepest levels of the unconscious mind, instilling firm commands: Set fire to your tape-copying software. Kick your cassette until violent.

Do you think it could work? The technical details of all this would, of course, have to be left

to the software people to sort out. I fully expect that as the technique is developed further along William Gibson's lines, the twitching, brain-scrambled bodies of failed

There's only one small remaining worry. Recently I was using an assembler which (like so many assemblers) takes several hundred years to load from tape. Isn't available in disc, and software pirates will become commonplace.

crashes if you so much as breathe in the same room. One wrong keystroke at the menu level (let alone when actually trying to run machine-code) can make the whole thing seize up. I know this

because I hit a cursor key by mistake and the program had a fit. Furious bashing at the *break* key produced a mysterious pause and then, before I was dumped back into Basic, the message "Copying tapes is illegal" appeared.

I spent several hours hating and cursing whoever wrote that program. I haven't dared since even to pick up William Gibson's book, just in case...

DAVID LANGFORD

David Langford

I spent several hours hating and cursing whoever wrote that program. I haven't dared since even to pick up William Gibson's book, just in case...

because I hit a cursor key by mistake and the program had a fit. Furious bashing at the *break* key produced a mysterious pause and then, before I was dumped back into Basic, the message "Copying tapes is illegal" appeared.

crashes if you so much as breathe in the same room. One wrong keystroke at the menu level (let alone when actually trying to run machine-code) can make the whole thing seize up. I know this

There's only one small remaining worry. Recently I was using an assembler which (like so many assemblers) takes several hundred years to load from tape. Isn't available in disc, and software pirates will become commonplace.

to the software people to sort out. I fully expect that as the technique is developed further along William Gibson's lines, the twitching, brain-scrambled bodies of failed

Do you think it could work? The technical details of all this would, of course, have to be left

to read, conveys a subliminal message straight into the deepest levels of the unconscious mind, instilling firm commands: Set fire to your tape-copying software. Kick your cassette until violent.

screen, sucking in the gaze of the user, producing a deepening hypnotic trance (unless, of course the high-res graphics aren't too hot) until the screen, flashing on and off too swiftly for the eye

[illegible]

the optic nerve. This can cause epilepsy and softens up the miscreant for the appalling sub-sonic vibrations which drone from the m-cro's speaker, at those special low frequencies

At the first break-in attempt, the program hits back! First the screen begins to flicker at a certain strobe frequency, tuned to the rhythms of the machine's internal clock.

men ever to walk this earth, wants to make a
furtive and illicit copy of *Pimanic Kongtrogger*
Liamattack for his own vile purposes. The first
step of his monstrous plot is to break into the

On the ordinary, commercial scale I see it working something like this. Professor Moriarty, a criminal of deepest dye and one of the most evil

If the puzzle can be sensibly solved using a computer, then the winner will have included a listing of the program used to find the correct answer. The closing date for Puzzle No 136 is December 31.

Winner of Puzzle No 131
The winner is Jenny Lightowler of Burnell Road, Sheffield, who receives £10.

```
VALSTR$(S0))) 80 IF S0 < F AND S0 = INT(S0)
THEN PRINT "T", I, "ROWS", ROW "SORS", F,
"2", S0 90 NEXT F 100 ROW = ROW + 1 110
GOTO 30
```

solution.

The program generates successive triangular numbers by summing consecutive integers, each total being tested to see if it can be broken into component square pairs. The first answer that

Solution to Puzzle 131
325 blocks can form a triangle of 25 tiers, and squares of: 18 x 18 and 1 x 1; 17 x 17 and 6 x 6; or 16 x 16 and 10 x 10.

Now, the doctor had the advantage of knowing Master Scatterbrayne's age. We don't, but can you determine what the combination was — and Simon's age?

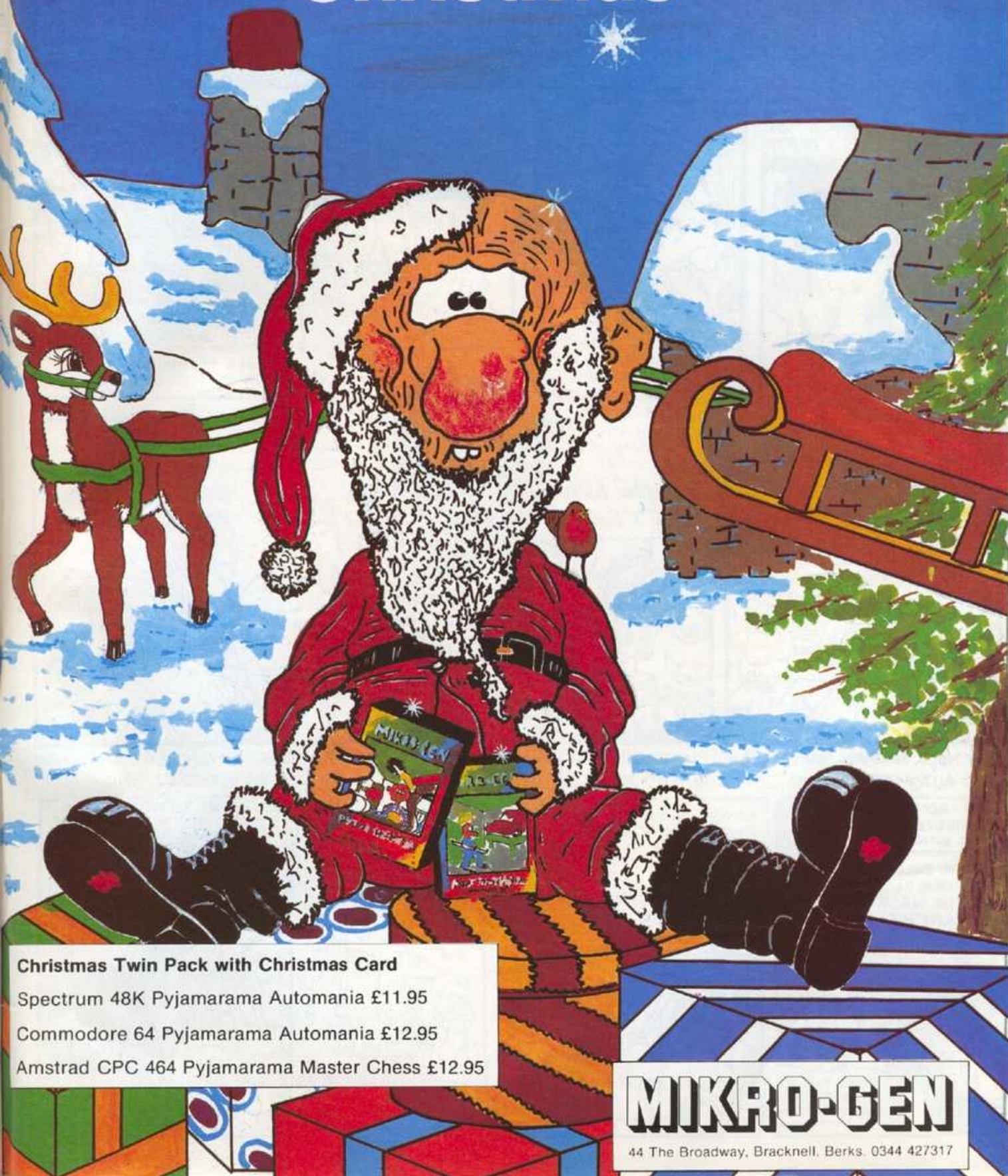
"I know exactly which one it is," exclaimed Simon, "You see, I have just recalled what the

"I know that the number divided by the sum of its digits is equal to my age (in years)," he said hopelessly to Dr. Dimwitz, who happened to be passing.

Simon Scatterbrayne has chained his bicycle to the railings outside the 'Dog and Puddle', and now finds that he has forgotten the 3-digit combination that opens the lock.

Locked out

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

AHEM, LADIES AND GENTLEMEN, BEFORE WE CONTINUE WITH THIS WEEKS CARTOON, I'D JUST LIKE TO BID THANKS, ON BEHALF OF MY PAIS AT AUTOMATA, TO ALL THE EXHIBITORS AND VISITORS AT THE LAST ALLY PALLY ZX MICROFAIR, WHOSE KIND DONATIONS TO THE ETHIOPIA DISASTER FUND TOTALLED £218. THANK YOU.

THE GANG HAVE PASSED THROUGH THE GATES INTO PILLAND WHERE THEY MUST SORT OUT THEIR TAX...

WELL, D'YOU KNOW ANY GOOD HOTELS?

YEAH-A MATE OF MINE WORKS AT THE SAVELDY.

BEEN BRAHM...

NOW-ZE KARTUNE!!

HE'LL LET US HAVE A ROOM OR TWO FOR A FREE COPY OF BARTZ.

WATCHIT, PIMAN - THAT'S ADVERTISING, NOT EVER NEXT?

WELL? DID YOU FIX US UP?

NO! HE'S LEFT!

SOME PI IN A FUNNY COSTUME WAS THERE...

LET'S TRY THE PILTON!

SORRY, FILTUS VPPUS!

NONSENSE! YOU MUST HAVE SOME SPACE HERE!

NOPE, SORRY.

PRAKTUS TITUS!

LISTEN, SLOB... IF YOU DON'T FIND US A ROOM, WE'RE ALL GONNA BOSS IN YOUR LOBBY-FOR-EVER!!

WELL, PERHAPS THERE IS A SPACE...

GREAT! SITUATED TWIXT A FORDESCORT AND A CHARIOT IN THE HOTEL MULTISTOREY CAR PARK.

WHAT ARE ALL THESE ROMAN PIMEN DOING HERE, ANYWAY?

KEEPING THE LOCALS OCCUPIED?

HEY, I KNOW A SHIPTUAR SONG AROUND SHARLOTS...

SWEET CHA!

OH, COME TO TO CARRY ME 'OME...

I MUST DO MY LAUNDRY - I DIDN'T BRING A CHANGE OF PILLOW-CASE, WHO ELSE IS COMING?

LET'S ALL GO AND WASH OUR DIRTY LIMEN IN PUBLIC!

SOFTWARE LAU

MUST BE FAIRY SNOW!!

HERE WE BEGINNING TO SNOW!

ARE... OH, IT'S

OH - NO ROOM AT THE LAUNDETTTE EITHER, YOU BOYS GONNA BE LONG?

AR, WE BELONG ON YARNDER ILL, BUT WE GOTTER WASH UMMAR SACKS! WANT ANY SOPE FLAKES?

THANKS, BUT MY CHUM, KASTAPIMAN IS BRINGING SOME

NO MAN, AH SAID AH WAS GREENGIN MAH AERIAL!!

HEY! THERE'S SOMEONE IN THAT MACHINE, GOING ROUND AND ROUND WITH THE SOCKS! STAND BACK!

NAM! DON'T DU THART!!

YEUK! WATER! SOCKS! SUDS, SUDS, SUDS! IM SURROUNDED BY SILKY SUDS, SUDS, SUDS!

E KEEP! AGN! E'AD A MESSIT, SOM WE SHOVERD IM INSIDE!

IT'S ALL PI IN THE SKY!

WELL BEFORE I DELIVER MY MESSAGE...

WHAT'S COMING NEXT? WHAT ARE THOSE GUYS AT AUTOMATA UP TO?

DAVID LAKE PCW

FIND OUT MORE - NEXT WEEK!!!

GET YOUR AUTOMATA XMAS STOCKING! PIMAN'S GREATEST HITS VOL II AND THE 1985 CALENDAR - ONLY £4!! ONLY FROM US: AUTOMATA U.K. LTD, 27, HIGHLAND ROAD, SOUTHSEA, HAMPSHIRE PO4 9DA. TEL (0705) 735242. (END OF AD.)