

POPULAR

40 Rock

Only 50p.

Computing

with Home Computing Weekly

WEEKLY

21-27 November 1985

It's the best selling weekly

Vol 4 No 47

Acorn paves way for 16-bit BBC machine

ACORN has unveiled its long-awaited Communicator micro/modem/telephone device to rival ICL's QL-based One-Per-Desk unit.

The Communicator is the first Acorn product to use the 16-bit version of the BBC and Electron's 6502 processor, the 65SC816 chip.

Its launch at the Compec Business Computer Show has increased speculation that the 16-bit version of the BBC – the BBC C – based on the same chip, may be released next year.

Acorn is committed, through its agreement with the BBC which has another

four years to run, to continue to introduce new BBC models. The 65SC816 software compatible 16-bit version of the BBC micro was originally

expected to have been released in time for Christmas but Acorn's cash troubles and the two financial rescues by

continued on page 5

INSIDE THIS WEEK

- Soft Aid money paid – p4
- Six-page guide to Christmas micros – begins p9
- Build your dream micro and win an Amstrad 6128 – p28

Back to the Future



ELECTRIC Dreams has licensed the new Steven Spielberg produced movie Back to the Future and is developing an arcade adventure game based on the film plot, due to be launched in January, about a month after the film is released.

It will be the first computer game to feature actual pictures from a film, digitised and incorporated into the game.

The film concerns Marty, who travels into the past to 1955 and meets his parents, then the same age as him.

continued on page 4



THE MS 2000 mouse package for the C128 and C64 can act as a pen, paint brush or air-brush, to draw straight lines, free lines, dotted lines, rectangles, circles, or ellipses.

The software is icon-driven, using pull-down menus.

It costs £69.90, including the software. Details from Wigmores House, 32 Savile Row, London W1.

MICRO MAGIC



Find out if you have won an Amstrad 6128 this week or at least some special Popular Computing Weekly cassette labels. Enter your personal Micro Magic number into our special computer program on page 36.

INSIDE WORLD DOUBLES SNOOKER TICKETS TO WIN — SEE PAGE 6



LORD OF THE RINGS

GAME ONE

AT LAST! The eagerly awaited sequel to the fabulous classic "The Hobbit" is now available. "The Hobbit", classed as 'the ultimate adventure game of all time', was just a taste of what you can expect in LORD OF THE RINGS. Astonishing vocabulary, graphics and more locations than you could imagine possible!

LORD OF THE RINGS Game 1 is available on C64, BBC, Spectrum and Amstrad at £15.95. This stunning package includes two cassettes, large booklet and a copy of "The Lord of the Rings" Part 1.

M E L B O U R N E H O U S E

4 NEWS

Soft Aid cash latest . . . ST software at Compec

6 COMPETITION

Win tickets to the World Snooker Finals

10 HARDWARE SPECTACULAR

A hard hitting summary of the machines on offer this Christmas

12 BUYERS GUIDE

What machine costs what and where to buy it

17 BYTES AND PIECES

More useful routines and technical hints for use in your own programs

18 SOFTWARE REVIEWS

Batalyx on the 64 and I of the Mask for the Spectrum

20 QL

Beef up SuperBasic with these extra commands

23 SPECTRUM

Part two of our turbo Save and Load routines

25 COMMODORE 64

A comprehensive database for tape and disc users

27 AMSTRAD

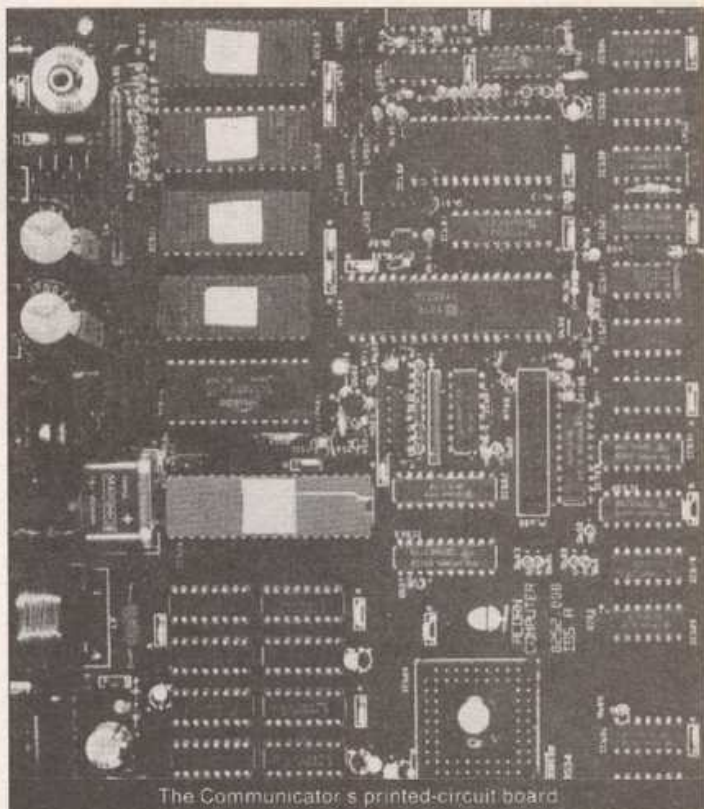
A sophisticated sound sampler using the Amstrad tape machine

28 FUTURE MICRO

Design the micro of your dreams . . . and find out what it would cost

31 BBC

Interrupt driven music in your own programs



The Communicator's printed-circuit board

5 Micro Magic

44 Charts

6 Letters

48 New Releases

34 Adventure Corner

50 Puzzle, Ziggurat, Hackers

36 Adventure Corner

EDITORIAL

Anyone who is intending to buy a micro this Christmas faces a bewildering and unprecedented choice.

With 20 or so different models to choose from, where does one begin? The most disturbing aspect of it all is that never has the future looked so uncertain. Not in terms of company crises, since in fact after a traumatic year most companies now look relatively stable, but in terms of machines.

How many of this Christmas's micros will continue to be manufactured next year? And how many of next year's models will be compatible with the old ones? The answer is comparatively few of this Christmas's micros look to have a long future. And the new machines will be only upwardly software compatible.

Sinclair for example is likely to launch its second QL model next

year. It is unlikely to have microdrives and seems certain to have more than 128K. Programs for the new micro may be too big to run on the present QL. The 128K Spectrum also has the same memory advantage together with better sound.

What about Commodore's Plus/4 and C16 models? The company looks set to discontinue their manufacture next year and the main thrust of Commodore's activities is already going behind the C128 and Amiga. Will the final version of the Atari 820ST be the same as those being sold now? There has already been one Rom upgrade.

There is really only one guide. Without software the micro is just a mess of electronic components which can be very time consuming to bring to life. Choose on the basis of what software is available for each micro. Available now - not at some time in the future.

Editor David Kelly News editor Christina Erskine Features editor Graham Taylor Software editor John Cook Production editor Lynne Constable Editorial secretary Lucinda Lee Advertisement manager Jeff Raggett Advertisement Executive Diane Holyoak Classified executive David Osen Administration Geraldine Smyth Managing editor Duncan Scot Publishing director Jenny Ireland. Published by Sunshine Publications Ltd, 12-13 Little Newport Street, London WC2H 7PP. Tel 01-437 4343 Telex 296275 Typeset by Publishers Reprographics Services Ltd, 4 Roger Street, London WC1. Printed by Greenaway Harrison, Sutton Road, Southend-on-sea, Essex. Distributed by S M Distribution, London SW9, Tel 01-274 8811, Telex 281643 © Sunshine Publications Ltd 1985.

ABC

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

Popular Computing Weekly. Tel: 01-437 4343.

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

Computer Trade Association Magazine of the Year

ADVERTISEMENT

'The potential for great graphics on the Enterprise is incredible'
- Dave Collins, Bubble Bus



Spectrum settles Soft Aid storm

OVER £100,000 raised through the *Soft Aid* appeal due to be transferred to Band Aid at the end of October, but until last week still being held by the charity tape's distributor MicroDealer (see *Popular Computing Weekly*, November 14) is now to be paid over in full.

The company has reversed its earlier decision to pay the money in unspecified instalments and will release the full amount this week.

"I have been in contact with John Kennedy at Band Aid and we have agreed to pay over as soon as possible every single penny owed," said Michael Stern, chairman of MicroDealer's parent company Spectrum Group.

"I have today made out a cheque for the full amount owed until the end of November for £130,144.09 and we will be making further payments for the continuing sales of the *Soft Aid* tape in December and January."

"I am extremely disappointed in the way the *Soft*

Aid deal has been handled. I really did not know anything about this because MicroDealer runs as a completely separate enterprise. I am a man of honour and I have never come across a situation like this in the whole



Stern: man of honour

of my business life. I can assure you that as long as I am chairman of Spectrum Group every single penny that is owed to Band Aid will be paid over."

John Kennedy for Band Aid

confirmed he had received the *Soft Aid* cheque and said, "I am very pleased indeed that it has been possible to resolve the problem so quickly".

Last week Michael Stern was still trying to fathom out the details of the original verbal agreement between Rod Cousins and MicroDealer's joint managing director Neil Johnson. Neil Johnson left the company several weeks ago. "It was incredible that there was no written agreement relating to the *Soft Aid* distribution and fund collection," he commented.

● Spectrum Group - which distributes photographic equipment as well as home computers and software, last week announced financial results for the year to June 30 showing, despite turn-over up from £29.8m to £48.7m, an overall pre-tax loss of £5.12m. This compares with a profit of £1.8m for the previous year. The severe down-turn in the home computer market was blamed for the loss.

C128 monitor interface on the way

MICRO OWNERS up-grading to the new Commodore 128, should soon be able to use their existing 80-column monitor with the 128, thanks to an interface being developed by Robcom.

The C128 an RGB-I 80-col-

umn output and most monitors on the market - except Commodore's own 1701 model specifically for the C128 at £299.99 - require an RGB input.

Robcom's interface, though, will convert the RGB-I output into a form acceptable for an RGB monitor.

Further details from Robcom, 36 Market Place, London NW11.

Toshiba's new MSX now here

TOSHIBA'S enhanced MSX machine, the HX-22, is now in the shops. At £249, the machine features a built in RS232C interface, 80K Ram and 64K Rom. Part of that Rom space is taken up by the built-in word processor, *Bank Street Writer*.

"It's a bit late - we originally intended it for September, but this is the machine that takes us over into 1986," said Chris Greet, product manager of Toshiba UK.

Toshiba's first MSX micro, the HX-10, is currently being sold in a bundled package with software and a data recorder for £99.99, and looks likely to be phased out after Christmas.

"We'll probably be very low on stocks of the HX-10 next year," Chris Greet continued.

"But the prospects for MSX next year are looking good; interest in the standard has definitely been increasing."

Management buy-out at Thorn EMI

A MANAGEMENT buy out is being organised at Thorn-EMI Computer Software, following Thorn's announcement that it is to cease investment in its home entertainment distribution and publishing division.

Henry Kitchen, general manager of its international micro software department hopes that the new company will be up and running before the end of the year.

"The entertainment ranges, such as Creative Sparks and Sparklers, will come with the buy-out, as does the distribution," he said.

Thorn/EMI software, through its label Creative Sparks, produced a number of charting titles including *Macbeth* and *Orc Attack*.

ST gets program boost at Compec

NEW SOFTWARE for the Atari ST was well to the fore at Compec, the hardware and software exhibition for professional users, held at Olympia from November 12-15.

TDI Software introduced *TDI Modula-2/ST*, its modular programming language for software writers. It contains a full Gem interface and a full screen editor and compiler at £99.95. The company also showed UCSD Pascal, a full implementation of the language with a TOS filer for access to ST data at £145. Details from TDI at 29 Alma Vale Road, Bristol.

Lasersoft launched an ST version of its *Laserbase* database, originally developed for the Macintosh.

Chipsoft showed *ST Accounts*, a fully integrated accounting package comprising sales ledger, purchase ledger, nominal ledger and stock control. It was written specifically for the ST under Gem. Designed with small businesses in mind, it costs £287.50. Details from Chipsoft at 302, High Street, Slough, Berks.

On the hardware side, Acorn launched its Communicator micro (see separate story) and Commodore again tantalised visitors by only showing the Amiga at a nearby hotel to those with special invitations. Amiga representatives at Commodore's hospitality suite at Compec were closely guarding the whereabouts of the Amiga to would-be gatecrashers.

Future dreams

◀ continued from page 1

The film and game are about his adventures in 1955 and efforts to get back to 1985.

Back to the Future is the first of a series of film tie-ins licensed by Electric Dreams from Universal Pictures. At least two more are planned, based around major pictures currently in production and to be released during 1986.

Acorn paves way for 16-bit BBC machine

◀ continued from page 1

Olivetti earlier this year are thought to have put back Acorn's plans.

"If there was to be a BBC Model C we wouldn't admit it," said Bob Coates, Acorn's BBC micro product manager. "At the moment the concept of extending the BBC range is out of the window. Effort is now going into developing the BBC as the European standard for educational micros."

The Communicator - like the suggested BBC C - is Basic compatible with BBC Basic version 3.0. Just as with Sinclair's One-per-Desk project, it will not be marketed or

Acorn's parent company Olivetti and the British office automation firm ITL have apparently already shown interest in the machine.

The Communicator has Ram sockets for either 64K or 256K bit chips, so that the memory can be 128K or 512K. The machine can either use its own telephone handset available as an extra or can use an existing telephone connected to the Communicator. It also has a built-in V21 and V23 standard modem, Centronics compatible printer port, RS432 port, expansion bus, and RGB monitor output. A small liquid-crystal display is available as an optional extra. A number of software packages are available for the system including Acorn's MOS (modem operating system), Econet, BBC Basic, and a number of utilities and applications programs. It can also be quite easily made BBC machine-code software compatible.

It has a full qwerty keyboard with separate numeric

pad which can be used either as a calculator or telephone dialler.

An Acorn spokesman at Compec said that Acorn was now taking orders for the Communicator, and that the first production models would probably be seen early next year. When available, the machines will cost around a £1,000 for the basic model.

Superman out this week

SUPERMAN, Beyond Software's star title this Christmas, should be released for the C64 this week, after a delay of several weeks.

"First Star is very concerned that the holder of the UK rights, which is Beyond, and the European rights owner should get the title absolutely simultaneously," explained Clive Bailey of Beyond.

The European rights owner is US Gold, which will be making Superman available for export to the continent.

Yummie Yuppie and trendy

HEALTH, wealth and self-improvement software will be the next growth area for the software industry, according to an American research report.

The focus of the market will shift to the post-Yuppie generation and 'baby boomers', says the International Resource Development Inc, which predicts that a program which will evaluate a likely death date for the user and then output ways in which the user can postpone the inevitable will be big business in the late eighties.

Other areas where software packages could be useful are program to help people improve their memory, give up smoking, cut down on alcohol and exude sexual self-confidence.

International Resource Development is asking £670 for its report, entitled *Health, Wealth and Self-improvement Home Software*.



produced directly by Acorn. Instead it will be sold as a product to be 'badged'. Both

Sick of all your listings and those loose sheets of info getting lost?!

DATA BINDERS

Heavy duty, large capacity A4 binder with front and side pockets. Printed insert cards for easy identification. Comes complete with contents page and divider sheets. Colours - Black or cream to suit Micro.



£5.95

QuickShot II

£6.99

QL £10.95

KEMPSTON INTERFACES

Standard: £9.75
Tristate: £12.45
Professional: £16.45



on-off switch

and spectrum

£4.95



Please send me:

..... Qty.. £.....

..... Qty.. £.....

..... Qty.. £.....

My Computer is a Total: £.....

All prices include post & packing

Please make cheques payable to TEC Publications, 24 Victoria Rd, Bromsgrove, Worcs, B61 6DW.

Name.....

Address.....

Dealer Enquiries Welcome Tel (0527) 74567



TIGER SOFTWARE

Supplier of software and hardware to the home & business micro user.

November Specials!

COMMODORE 64 CHRISTMAS PACK OFFER!!

* CBM64 COMPUTER
* C2N DATA RECORDER
* MUSIC MAKER SYNTHESISER
* ADRIAN MOLE SOFTWARE PACK
* DESIGNER PENCIL

ALL THIS FOR ONLY £184.85

COMMODORE PERIPHERAL PACK!!

* MPS803 PRINTER + 1541 DISC DRIVE
BOTH FOR ONLY £185.50

* DPS1101 DAISYWHEEL LETTER QUALITY PRINTER:
PRICE ONLY £185.50

* MUSIC MAKER KEYBOARD £27.85

* COMMODORE 128 COMPUTER (3 computers in 1!) £251.85

* SANYO 14" FULL COLOUR MONITOR, COMMODORE COMPATIBLE - PLUS LEAD £169.50

* SINCLAIR QL COMPUTER, only £188.50

* EPSON P40 PRINTER (Parallel OR Serial) £50.75

* EPSON P80 PRINTER (Parallel OR Serial) £149.95

* BROTHER M-1009 PRINTER (Parallel) £174.25

Do you own a SPECTRUM, COMMODORE or BBC Micro? If yes, then why not join our TIGER CLUB? Membership is just £8.50 per year, for which you receive EVERY 2 months a computer game on cassette - selected from well known names plus an updated price list of peripherals and computers all at special LOW club members prices. Also, details of a very special offer - only available to TIGER CLUB members! - SEND S.A.E. for further details!

ALL PRICES INCLUDE VAT Please add £7 towards carriage.

TIGER SOFTWARE
6, NORTH HILL WAY
BRIDPORT
DORSET
DT6 4JX
Tel: 0308 23655

Name.....

Address.....

.....

.....

.....

Please send me

I enclose £.....

Please send details of TIGER CLUB ☐ (tick)

Letters

Limited protection

I read with interest your editorial concerning piracy (issue November 7) and the frustrations of using anti-piracy systems.

I have just fallen foul of the Lenslok system on the Spectrum version of *Elite* and feel I must warn others of its limitations.

Beware! I cannot get it to work easily with either my large 26 inch screen colour TV or my small - screen portable black-and-white. So, after hours of frustration I find I can't play the game - yet there is no warning of the apparent limitations of the Lenslok system given anywhere on the packaging.

The most irritating aspect of the whole affair is that Lenslok is totally unnecessary to protect *Elite*. It would be impossible to play the game without the 60-page instruction booklet or the keyboard function chart supplied in the package.

I have written to Firebird concerning the limitations of Lenslok and am awaiting their reply with interest.

Paul Ioannou
11 Second Avenue
Manor Drive
Halifax
N. Yorks

We would be interested to hear of other people's experiences with Lenslok and other protection devices. Certainly, we have experi-

enced difficulties loading games with Lenslok, and have even managed to confuse the Lenslok devices from different games. Surely, any protection system must be simple to use?

Warm appreciation

I would like to express this Trust's warmest appreciation for the extremely generous support from your readers, for our memorable Telethon event.

It was the help of this sort which has made it possible for us to give the backing to so many excellent causes for youth which really deserve all the support they can get.

I would like to say a very big thank you to all who contributed.

Baroness Lane-Fox
Chairman Thames Help Trust
306-316 Euston Road
London NW1 3BB

Customer in mind

Amstrad and Alan Sugar have come in for a lot of stick lately in *Popular's* letters pages, mainly on the grounds that they don't care about their customers because they introduced the 6128 machine so swiftly after the 664.

I think it's time the balance was redressed a little, as my own recent experiences with the company show they have the customer very much in mind.

I was lucky enough to get

one of the first batch of PCW8256 machines to reach Dixons, an important machines to me as a freelance writer making the switch from the typewriter to word processing. After a few days I discovered a problem with the feature which automatically page-numbered a document, the problem being that it didn't.

This turned out to be a bug in the first version of *LocoScript*, and a few days after reporting it I received a replacement disc with version 1.04 on it. A few days later another disc arrived, this time containing version 1.1.

Since then I've had a couple of other queries about using *LocoScript* to do certain things, the first being replied to by letter within a matter of days, the second by a lengthy phone call from Roland Perry who helped write the program as well as design the original CPC464. He was genuinely interested in how I found the machine and *LocoScript* in use.

I do think Alan Sugar made a bad decision over the release dates of the 664 and 6128 machines, but we're all entitled to one mistake and as far as I'm concerned he's never made any others. He produces excellent computers at very cheap prices with the lowest return rate in the industry. He delivers them on time, told people how many PCW8256s he was bringing in, doesn't produce mislead-



"It all started to go wrong when I discovered I needed a new monitor to up-grade my Commodore 64."

ing advertisements and doesn't hang on to his customers' money for several months without providing the goods.

Give the man and his company a break.

Mike Gerrard
London, N4

BBC software

I am writing to remind you of the fact that there is such a computer called the BBC. Your seem to have forgotten this.

C. Murray
6 Sarum
Roman Wood
Bracknell
Berks

We haven't forgotten the BBC at all, there just hasn't been much new software for the BBC in the past couple of weeks.

CDS Competition

Another ball game . . .

This week *Popular Computing Weekly* goes for maximum break with a competition to win two tickets for the World Doubles Snooker Championships. Five runners-up can have their pick of five great prizes featuring snooker champion Steve Davis.

The prizes come courtesy of CDS Microsystems whose computer snooker program endorsed by Steve Davis is available on all the popular home micros including Commodore 64, C16, Spectrum, Amstrad, QL and Enterprise. Versions for other machines are planned.

The prizes

First 2 tickets to the Hoffmeister World Doubles Snooker Championship at Northampton. These will be for the final

day's play on the 15th of December.

Five runners up may have their choice of prize from the following:

- Steve Davis T shirt
- Steve Davis Sweat Shirt
- Steve Davis Cue
- Steve Davis Video
- Steve Davis Autobiography.

The Competition

To win you have to correctly answer the questions below. Winners will be the first six correct answers drawn at random on the 6th of December. Send your answers to Steve Davis Competition, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP.

Questions

- 1) What, in snooker, is the correct order

for potting the colours?

- 2) Who is the current Snooker World Champion?
- 3) What is the total score value of all the coloured balls?

Answers

- 1)
- 2)
- 3)

Your Address

.

Micro owned

Prize preferred

All entries must reach us by 12pm on the 6th December. The editors decision is final.

MICRODEAL QL

These Great games are available for your QL



LANDS OF HAVOC A 2,000 plus screen Arcade Adventure described as the first MEGA GAME for the Q.L. Include 9 full colour maps... the book of change... excellent graphics and sound. The arcade style of this game makes it playable by young children and adults alike.

£19.95.

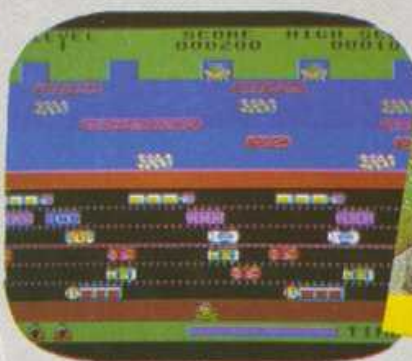
CRAZY PAINTER Incredibly addictive and totally original arcade game. 8 levels of difficulty, hi-res graphics and superb music. Try to paint the floor of a really busy house but chase off unwanted Dogs, Snakes and Bugs - avoid the tins and bubbles of turps and stop the paint running on a unique challenge screen.

£12.95



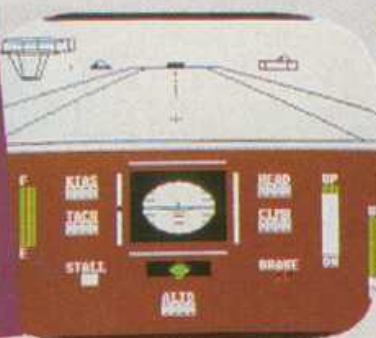
CUTHBERT IN SPACE Fast moving "jet-pac" type arcade game. Play the part of CUTHBERT looting the moronians planet. A real Zap arcade game with a strategic breakdown feature.

£14.95



HOPPER A giant leap forward for the Q.L. and guaranteed to keep you 'ribbitted' to your seats "FROGGER" type arcade game with extra lanes of cars and crocodiles!

£14.95



Q.L. FLIGHT Flight simulator with 9 different scenarios. Take off - land - refuel a light aircraft. You can perform aerobatics and fly from scenario to scenario. Avoid Power lines - Mountains and watch your fuel!!! in this realistic simulation. Wire line graphics. Release date November 1985. **£19.95**

24 Hour Order System

Microdeal games are available from Q.L. dealers or by post from:

MICROPOST

MICROPOST, 41, Truro Road, St. Austell, Cornwall PL25 5JE. Tel: 0726 68020.

All major credit cards accepted for telephone orders.





**Trying to play all the games you can get for the Sinclair
(About 5,000 times.)**



Spectrum could kill you.

How would you like to be blasted out of the sky by anti-aircraft guns?

Or perhaps you'd prefer to be vapourised by a Thargoid starship.

Or eaten for breakfast by mutant rats.

Well, you have all this and more to look forward to, if you get a Sinclair Spectrum +.

Because there are more games available for the Spectrum + than any other home computer.

(About 5,000 the last time we counted.)

Not all of which lead to such sticky ends, we might add.

You may, for instance, rather battle it out on the chess board with a Russian grand master. Or cross swords with Nick Faldo on the golf course.

You won't just have the pick of the current titles either.

You'll get first shot at the new ones too. Because most of them become available for the Spectrum + before anything else.

And because there are so many other Spectrum owners there are more books and magazines and clubs to join.

So if you get a Spectrum +, you may well end up in a Grand Prix pile-up.

And your chances of being killed by Gremlins are very high.

But you'll never die of boredom.

sinclair

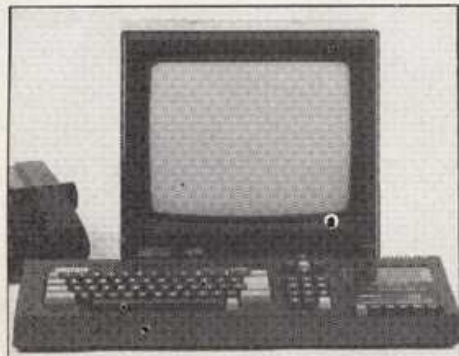
Xmas micro guide

In this guide to currently available microcomputers we have tried to look at the position both from the point of view of the first time buyer and of the upgrader. We have tried to be clear and unequivocal in our comments because, after all, a lot of money may be at stake. Nevertheless, remember that somebody, somewhere, thinks that nothing could ever surpass the dear old ZX81

Amstrad CPC464

A Z80 based 64K computer with a screen resolution of 640 x 200 pixels, a choice of up to 27 colours and an 80 column text screen using a monitor supplied as part of the machine. Choice of green screen or colour monitor. The keyboard is reasonable quality, suitable for typing, and features a numeric keypad, a cursor cluster and a facility to redefine up to 32 of the keys for specific functions.

The CPC464 also features a built-in cassette unit which has the immediate



advantage of neatness and compatibility, but has the disadvantage of requiring the whole unit to be sent away should it break down.

The machine has an excellent Basic with many sophisticated features including facilities to make use of system interrupts, and a three channel sound chip similar to those found in other home micros. One unusual feature is stereo sound output if connected to a hi-fi system. A Centronics port is standard.

Software

Unlike almost every other computer company in the country, Amstrad got the launch of the machine right and from day one there was software available. This was part of the reason for the machine's success and its success has in turn ensured plenty of software support. It is fair to say that the Amstrad is now nearly as well supported on new software releases as the Commodore and the Spectrum.

Amstrad software is comparable with Commodore 64 and Spectrum software, although it still tends not to get games

specifically developed for the strengths and weaknesses of the machine, but rather conversions of Spectrum titles. Sometimes (as with some of the Ultimate titles) these surpass the originals. With the addition of a disc drive giving CP/M compatibility, the Amstrad has better business software support than either the Spectrum or the Commodore 64.

Expandable?

Adding a disc drive to the 464 gives you not only fast program access but CP/M compatibility, which ensures a business software future for the Amstrad. Peripherals include light pens, speech synthesisers, Rom boards and serial interfaces. There is every reason to believe support will continue and grow particularly since peripheral devices for the CPC 464 should also be suitable for the 6128 (see below) giving potential suppliers a large market.

The only doubt over the machine's future is the same as that affecting all the most successful machines here - the technology is relatively old and at some point it will be superseded by more powerful machines. For most buyers this should not be a major concern, though.

Overall

The Amstrad 464 is a good first choice of machine for those who want a computer for the family. It is suitable for small business purposes (with the disc drive) and having a monitor included in the package means no TV arguments and better display.

If you are certain that your Amstrad will only be used for word processing/accounts purposes the green screen monitor will do, otherwise you would be well advised to spend the extra cash on the colour monitor. It is vital for games and most significantly there is yet no way of upgrading later, anyway you would end up with a wasted green screen monitor. Potential business users should probably be looking at the 6128.

When to buy

Chances are the CPC464 is about as cheap as it's going to get. Amstrad's policy of upward compatibility means

that it forms the entry level machine to a standard Amstrad will continue to build on. As such it will be supported for a while yet.

Amstrad CPC6128

Main technical features are as CPC464 since the two machines are in these respects identical. The 6128 comes with a built-in disc drive and 128K of memory. This also means that it automatically has CP/M compatibility (as when you buy a disc drive for the 464). The machine does not have a built in cassette, but will nevertheless load cassette software from your own cassette player.

The 128K actually gives 41K available to Basic, though some of the extra memory can be used to hold data or screen information. CP/M is given 61K.

Software

Compatible with all CPC 464 programs except a handful produced by independent suppliers. It has full compatibility with CP/M 80 except that the Amstrad uses 3" discs rather than the usual 3½" format. Virtually nothing is available 'off the shelf', although Amstrad seems to be



making some efforts to gain licences.

The CP/M compatibility has some problems associated with it. Many of the big name CP/M programs like *Wordstar* cost £200 or more. Their manufacturers are not keen to make them available at the kind of prices appropriate to home micro owners.

What seems more likely to happen is that Amstrad will make available some of the lesser known CP/M titles at a more reasonable price.

Expandable?

As CPC 464. It looks set for a good few years. Don't expect to see many games specifically for the 6128, since it isn't really in suppliers' interests to produce games which aren't 464 compatible.

Overall

If your budget will go this far and being on the cutting edge of technology is important to you, this must rank highly. It is excellent value and a potentially valuable tool for small businesses at a fraction of the cost of anything similar. See 464 for colour monitor choice.

When to buy

Not likely to get much cheaper.

Amstrad PCW8256

A Z80 based computer with 256K of Ram. Although related to the technology of the other Amstrad machines, the PCW8256 is different in several important re-



spects. It does not have colour graphics or sound, but instead features a 90 column by 32 lines display on a monitor. A 3" disc drive is built into the monitor space and a printer comes as standard.

The 82 key keyboard is specifically designed for use with the sophisticated built-in word processor which forms the *raison d'être* for this machine - the PCW8256 is simply an excellent word processor at an astonishing price. That it will also run CP/M, comes with a sophisticated Basic and DR Logo as standard is not insignificant.

Software

This machine is not compatible with other Amstrad micros - something some dealers seem to be curiously unaware of when they are selling you one. It will run CP/M, but suffers from the same problems as the 6128 and the fact that *Dbase II*, for example - an obvious office partner for the word processor - costs nearly as much as the system.

Nevertheless, Amstrad does seem to be sticking to a promise to get plenty of CP/M material converted to 3".

Expandable?

Essentially a unit designed for a specific purpose so questions of expandability become less important. There is an option to connect a 3" disc drive (very significant for the reasons given above) and to connect another printer.

Overall

In the end it seems that most micro

owners only find one or two serious uses for their machines - word processing and storing information. If you are sure that your requirements will never extend to games or colour graphics, this is your first choice machine.

When to buy

Won't get cheaper, but might be worth waiting to see what software turns up.

Atari (except 520ST)

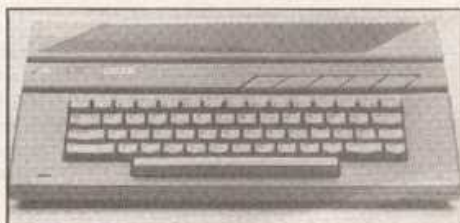
Though remodelled a couple of years ago, the Atari machines (memory is the only difference) have been around for ages - before the Spectrum, in fact. It is testimony to the excellence of the original design that in many ways they are graphically superior to any of the machines in their price bracket today.

The machines have a 6502 chip and a number of specialist chips for sound and graphics, which give superb results. For example, the sound chip is rivalled in facilities only by the Sid chip, but has four instead of only three channels.

The maximum screen resolution is 320 by 192 with a choice of 256 colours, up to 128 of which may be on screen at the same time. The keyboard has 62 keys including a number of special function keys for Basic commands like *Reset* and *Start*. Standard ports include a Rom slot, two joystick inputs, monitor connection and an edge connector.

Software

A complex situation. There is a vast amount of existing software for this machine mostly from America, but there is relatively little support for it in this country. There are games which will certainly be converted for the Amstrad, Spectrum and Commodore, but almost never converted for the Atari. This does mean that Atari owners miss out on much of the most exciting home grown software. There is no question, however, of being 'stuck' with an unsupported machine.



Expandable

There are a vast number of Atari peripherals of every kind. A wide choice of printers and graphics tablets, light pens, etc. The only problem is that connecting non-Atari products requires an interface such as the 850 interface module (£99).

Overall

The machines are being offered in various bundle options at very cheap prices.

If you aren't worried about having any particular titles available to you and are

happy to 'put up' with classics like *Pole Position* and *Raid on Fractalus*, you won't find anything cheaper. One point, buy a bundle that includes a tape machine.

The 128K Atari XE is a recent machine fully compatible with the old ones, but with extra memory and a stylish new keyboard. There is not, however, any software available that makes use of the extra K and it does not, like the bigger Amstrad machines, have any compatibility with another operating system.

When to buy

Can't get much cheaper.

Atari 520ST

Utterly different from the other Atari machines, indeed potentially more powerful than any other machines, here. The Atari ST uses much more recent technology than the others, the 68000 processor is faster and can address a larger memory. The machine comes with 512K as standard although a 260ST is still awaited.

The machine comes with a wide variety of ports, centronics, serial, RGB video output, joysticks, mouse connection and Midi giving it compatibility with



electronic musical instruments.

The ST features Gem command system - an equivalent to the Apple Macintosh's highly regarded system of icons and mouse operated user interface.

Despite Midi, the ST comes with a fairly standard sound generator like that on the other Atari machines. Where the extra power really shows is in the graphics - a maximum resolution of 640 by 400 pixels and 512 colours. To get the benefit of this, you will need to buy a high resolution monitor and a disc drive.

The extensive keyboard has 95 keys and a numeric keypad, although many commands can be issued via the mouse which is included in the system.

Software

There isn't any. Well, that's not quite true: there are a tiny number of pieces of independent software, mostly sophisticated utilities for machine code programmers. The machine does come with Gem Paint graphics system and Gem Write word processor as well as a couple of operating systems but essentially the machine is too new for any real software base to have built up yet.

Expandable?

The memory can be expanded almost ad infinitum. The machine is compatible

Hardware spectacular

with most printers and other devices like modems. Atari can be expected to aggressively support the ST if it proves successful.

The Midi compatibility is a nice touch for musicians and means recent electronic keyboards can be connected and controlled from the ST.

Overall

A wait and see. Though cheap for the price, in one sense, the 520 ST with a monochrome monitor and disc drive nevertheless costs £749 and a colour monitor will almost certainly be necessary at some point. A better bet looks like being the 260 ST which will come with a built-in disc drive for around £400 to £500 (that reduced memory won't bother most people) and is more likely to gain big sales. Then we could see some exciting software for the machine. For those who are really interested in the state of the art, for whom money is no object, an Amiga would be a much better choice.

The problem with the ST is that nobody is keen to be part of an experiment with a new technology and everyone is waiting for everyone else. I can't advise you to do differently.

When to buy

Wait. Wait. Wait.

CBM C16 and Plus/4

These two machines are compatible, although marketed differently. The C16 sold reasonably well last Christmas, but it is fair to say that both machines have been major failures for Commodore. There are a variety of reasons for this, their own competition from the 64 is one, the memory of the C16 another.

The Plus/4 is marketed as a sort of business machine and reference is made to the built-in business software it contains. However, this software is barely beyond a toy and would not be suitable for most day to day business purposes.

We have not included full details of these machines simply because the advice is simple - they have almost no software support, are unlikely to get any and cannot be recommended, despite the fact that a number of chains are offering them at very low prices.

Commodore 64

A very successful machine in this country only beaten by the Spectrum for sales. The Commodore 64 is highly regarded as a games machine because of its good quality graphics (similar the the Atari but with less colours), and extraordinarily good sound. The Sid chip, though only three channels, is very powerful and does amount to a synthesiser

within the machine. A number of recent software titles have indicated just how flexible the chip can be. Although nominally 64K, the memory for most programming purposes is more like 40K.

The biggest complaint about the Commodore is its very poor Basic which gives no easy access to the high res graphics or sound. This makes life very difficult for the beginner who finds that a whole string of Pokes is needed to use the sound chip effectively. This is one



reason why the machine has done fairly badly in educational markets.

The main 6502 processor is also slow and there are a few occasions where this has meant games which run less effectively on the Commodore than, say, the Spectrum.

Software

Vast. Almost all the major games houses in this country support the machine and

'The Buyers Guide

	Spectrum Plus package	Sinclair QL	Commodore 16 starter pack	Commodore 64 Christmas Compendium	Commodore Plus/4	Commodore 128	Acorn Electron	BBC Plus 64K	BBC Plus 128K
Boots	£139.99	£199.99	-	£199.99	-	£269.99 (in top 25 stores only)	-	-	-
Comet*	£129.95	-	-	-	-	£286.90 (and with 1570 in single package)	-	-	-
Dixons/Currys	£139	£199	£49.99	£199	£99.99	£269.99	£99	(by special order only)	(by special order only)
Greens	£139.99 (includes light pen)	-	-	£199.99	£99.99	£269.99 (in selected stores) £449 with 1570 disc drive	-	-	-
John Lewis	£129	£199	-	£199	-	£445 (with 1570 in package)	-	-	£495
John Menzies	£139.99	£199.99 (with Seikosha CP5 printer)	-	£199.99	-	£269.99	-	-	-
Laskys	£139.99	-	-	£199.99	-	£269.99 (£449.99 with 1570)	-	-	-
Rumbelows	-	-	-	£199	-	£269	-	-	-
WH Smith	£139.95	-	-	£199.99	-	£269.99 (in selected stores only)	-	-	-
FW Woolworth	£109.95 (cpu plus software only)	-	£49.95	£199.99	-	-	£49.95 (selected Woolco stores only)	-	-
Selfridges	£139.95	£199	-	£199.99	-	£269.99	-	-	-
Spectrum Group†	£139.99	-	-	£199.99	-	£269.95	-	-	£499

* Prices reviewed regularly, but were correct when going to press
† Prices approximate - exact price is settled by individual stores

there are few new titles that do not appear on it. Games are frequently of excellent quality and variety. The machine is marginally less well supported in terms of other kinds of software; the educational market has already been mentioned.

Nevertheless there are plenty of databases, word processors and languages to go around. Serious software is marginally more expensive on the Commodore than the Spectrum.

Expandable

No problems here; there are plenty of peripherals available for the machine from digitisers to sound samplers. In fact, musicians will find a host of different sound generation and controlling devices available. However, to connect the 64 to conventional printers and modems, various interfaces are required.

Overall

A good choice as a games machine, a less good one for education. As a business machine the C64 is a contender but perhaps not first choice because of the compatibility problems.

When to buy

Unlikely to get any cheaper nor will it be superseded by anything at a similar price. See C128.

C128

A curious hybrid machine recently launched. It features a Commodore 64 and a Z80 processor for CP/M compatibility in one box. Somewhat similar in its effect to the Amstrad 6128. Whilst the standard Commodore disc drive is, unlike the built-in Amstrad one, 5 $\frac{1}{4}$ " and therefore immediately CP/M compatible it is not part of the machine and must be bought separately. Without it the C128 is merely a Commodore 64 and therefore the disc drive can hardly be regarded as optional. This makes this machine rather expensive compared to the Amstrad 6128, which offers similar facilities for less and includes a monitor.

Expandable?

As Commodore 64 plus the bonus of CP/M compatibility.

Software

As C64 plus CP/M although, again, relative to the price of the machine much CP/M software is expensive.

Overall

As a Commodore 64 this is a machine with plenty of software backup; in its other guises it becomes rather an expensive way of getting CP/M compared to the Amstrad 6128.

When to buy

Some problems getting hold of the disc drives at present, so wait. The very cynical are betting on it not doing well at its current (with disc drive) price.

BBC B

The basic specifications are a 6502 processor with 32K Rom and a maximum screen resolution of 640 x 256 pixels. A large number of ports come as standard including a Centronics printer port, four analogue ports, a user port and a serial interface. Sound facilities are similar to the Amstrad, although the various sound parameters are more complex.

The point about the BBC is flexibility - there are a vast number of possible permutations. The BBC+ is essentially the same machine with 64K instead of the usual 32K and the BBC 128 has 128K.

Software

Plenty of software around, particularly of an educational bias. The machine is still the popular choice for schools and is outrageously overpromoted on every BBC TV computer programme. Some basic programs like word processors and databases are available as chips.

The computer is much less well served for games, whilst there are plenty around and a few classics like *Elite* and *Revs*, most of the more interesting

to What's Where'

Amstrad CPC 464	Amstrad CPC 6128	Amstrad PCW 8256	Atari 800XL	Atari 130XE	Atari 520 ST	MSX	Tatung Einstein	Enterprise 128	Memotech MTX 512
£299 colour £199 mono	£399 colour £299 mono	-	-	£169.99	-	Toshiba HX-10 package: £99.99	-	-	-
£289.95 colour £189.95 mono	£384.95 colour £289.95 mono	-	-	-	-	-	-	-	-
£299 colour £199 mono	£399 colour £299 mono	£460	£99.99 (with data recorder, software, joystick) £169.99 (with 1050 disc drive)	£169.99	-	Sony Hit Bit: £99.90	£399 (special package)	-	-
£299 colour £199 mono	£399 colour £299 mono	-	-	-	-	Toshiba HX-10 package: £99.99	-	-	-
£289 colour £189 mono £299 colour £199 mono	£384 colour £289 mono £399 colour £299 mono	£460 £469.99	-	-	-	-	-	-	-
£299 colour £199 mono	£399 colour £299 mono	-	-	-	£749.99	Toshiba HX-10 package: £99.99 Toshiba HX-10 package: £99.99	-	-	-
£299 colour £199 mono	£399 colour £299 mono	£458.85	-	-	-	-	-	-	-
£289 colour £199 mono	-	-	-	-	-	Goldstar: £149 (selected Woolco stores only)	-	-	-
£289 colour £199 mono	£399 colour £299 mono	£457.95	-	-	£749	-	-	£249.95 (64K £179.95)	-
-	-	-	£99.99	-	-	-	-	-	£99.99

Prices are subject to change without notice, but to the best of our knowledge, were correct at the time of going to press.

Hardware spectacular

titles do not appear on the machine. This is partly because the memory of the basic machine - 32K is too little, and also reflects the fact that the machine is not as popular for games as the Spectrum/Commodore 64/Amstrad triumvirate.

Expandable?

It is the expandability of the BBC that has kept it going over several years. There are additional processors, teletext adaptors, Prestel adaptors, speech chips, even an IEEE adaptor and a Winchester disc. The BBC B's standard disc drive is excellent and fast and is one of the reasons the BBC has been used successfully as a business machine.

Overall

The BBC B (and the other BBC machines) are by general agreement overpriced and underpowered. They have two large virtues, BBC Basic which, being used in schools, means continuity for your children at home and flexibility through the vast number of ports.

When to buy

People are always predicting a BBC price drop and it may be that because it has been dropped recently the basic BBC B may be around cheaply.

Electron

As BBC B except that this cut down machine lacks most of the ports found in that machine and some of the graphics modes. Although the Basic is exactly the same, some of the more sophisticated hardware controlling Basic commands are not available.

Software

Less available than the BBC, though there are few major differences between the machines. Some companies produce programs with a BBC version on one side and an Electron version on the other. There is little quality disc based business software for it.

Expandable?

Much less than the BBC, Acorn do a basic add-on, but the machine is far less well supported.

Overall

Best to avoid the Electron unless your main concern is BBC Basic compatibility.

When to buy

Available in some cheap 'bundle' deals from specialist chains for Christmas.

MSX

MSX is not a machine but a standard. There are various, mainly Japanese, machines which run MSX, but they are essentially the same. Differences revolve around layout and keyboard rather than anything else. The basic MSX standard is fairly similar to the Amstrad 464, Z80 processor, 64K (mostly), graphics resolution of 256 by 192 pixels and

the fairly powerful Microsoft Basic.

The MSX machines are fairly well supplied with ports including Centronics, twin joysticks, video and cartridge. Most MSX machines feature high quality keyboards with function keys.

Software

Generally poor. The machines are supported by a few companies but most software comes via Japan and Europe where the MSX system has been more successful. At their best the MSX games are up to anything seen on the Commodore 64; indeed with their use of sprites they tend to look fairly similar. But there is plenty of sub standard material out at full price on MSX which would be forced into a budget price range on the Commodore 64.

Expandable?

Rather restricted. There are a few light pens, disc drives around, but the amounts and variety is limited and prices are high.

Overall

Though well made with good Basic and a few good games, the first batch of MSX machines do not seem like good buys. There is a real danger of their being left on the shelf both literally and metaphorically.

When to buy

If you really want an MSX machine, it's worth hunting around. They are on sale for very low prices.

Spectrum

Z80 based microcomputer with 48K. Graphics resolution of 256 by 192, but problems when trying to use colour to that resolution. The colour resolution is lower and this means that the infamous 'attribute problems' occur when, for example in games with moving figures, the objects change colour as they move past different backgrounds. The sound is appalling: one channel simple beep that stops all other processing activity. Continuous sound with fast moving graphics is therefore impossible, although clever programming can get around this. Limited ports, user edge connector, TV output, load and save, and that's it. The keyboard on Spectrum + is plastic without a step (in early models if you turned it upside down the keys fell off).

Software

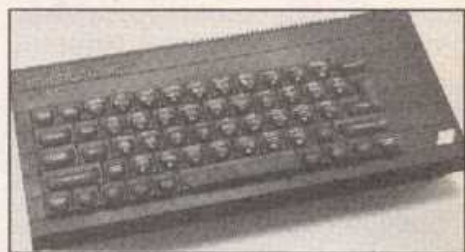
Unrivalled. Not only does virtually every software house in the country produce material for the Spectrum, but some of the most innovative material appears first on this machine. Pioneering work by Ultimate Play the Game amongst others raised the level of what was possible and could be expected from the Spectrum. Quality products also helped in the development of an extensive range of budget software.

Though nobody's first choice as a

business machine since, amongst a thousand other things, the Spectrum doesn't even have standard disc drives, there is a reasonable amount of such material around.

Expandable?

Most of the Spectrum's deficiencies can be remedied; Centronics interfaces, and



joystick ports are a first choice. Sinclair's Interface one gives a serial port and the controller for Microdrives - Sinclair's special form of disc drive that has the qualities of being very small and not always working properly. Proper disc drives are available, though not necessarily compatible with most software.

Through sheer force of popularity, Spectrums are well served in almost any kind of peripheral going.

Overall

The Spectrum is not a good computer. (Letters to the editor please.) It was, however, a price busting computer and deservedly became a massive success and that fact alone is enough to make it worth placing high on anyone's list.

When to buy

The only reason to wait is that there will be a 128K Spectrum early next year which might force a small price cut on the Spectrum +. What is worth while is looking out for the Spectrum 48k (rubber key version); this can sometimes be bought cheaply and is exactly the same internally as the Spectrum +. With the money you save you could then buy a decent keyboard.

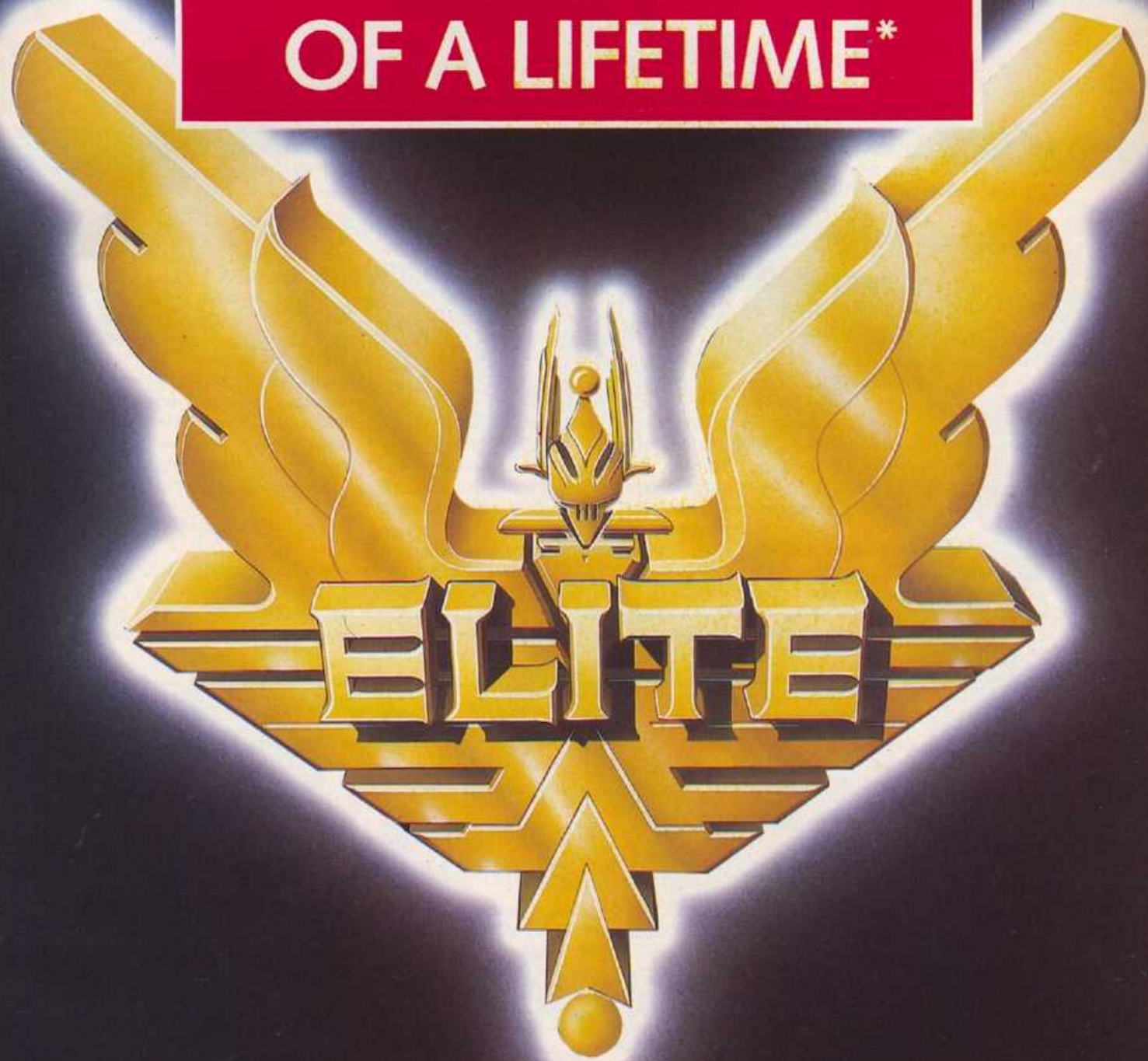
QL

A 68008 based machine. This chip is one of the 'new wave' of processors that will (at some point) replace the existing technology. The 68008 is essentially the same as the 68000 found in the ST.

The QL has two microdrives built in, a flat Spectrum + style keyboard with five function keys and 128K as standard. Screen resolution is a maximum of 512 by 256 pixels meaning that a monitor is necessary for best effect. Eight colours are available, although there are ways of combining them to make extra colours.

The machine has a fine Basic called SuperBasic which contains features beyond those found on the BBC. It also comes with four generally well regarded software packages; *Archive*, *Easel*, *Quill*, *Abacus* which are database, business graphics, word processor and spreadsheet respectively.

THE GAME OF A LIFETIME*



Available for Commodore 64, Spectrum 48K and Spectrum +. Coming soon: Amstrad and MSX.



FIREBIRD SOFTWARE · WELLINGTON HOUSE
UPPER ST MARTIN'S LANE · LONDON WC2H 9DL

WINTER SPORTS

*Ice Hockey, Speed Skating, Ski Jumping,
Down Hill, Slalom, Giant Slalom, Bob Sled, Biathlon.*



*Electric
Dreams*

S O F T W A R E

Available on the 48K Spectrum and Amstrad from Electric Dreams Software.
31 Carlton Crescent, Southampton. Tel: (0703) 225282

Hardware spectacular

Sound facilities, true to Sinclair form, are dire. One channel only, although this time it doesn't hold up the rest of the processing. A step forward, I suppose. Main ports: two serial, two joystick (non standard) video, TV, memory, Rom.

Software

Poor. Though the machine has been out for a while, there are few quality packages available. The games, in particular, are below Spectrum quality for the most part, ridiculous given the extra power of the machine. Business packages are better; Sinclair has put out a few cash programs and training packages of some merit. Independent houses have mainly concentrated on programming languages and the like. However, with the price drop from £399 to £199 the situation may change.

Expandable?

Proper disc drives are available, as is a centronics interface for most printers. Generally, the basic peripherals like modems, joysticks, disc drives have turned up. The more esoteric stuff has not; for example, no light pens or speech synthesisers as yet.

Overall

A flawed machine which mixes exciting new elements with drastic bodes in even measures. It has a powerful processor but, despite everything Sinclair says,



those Microdrives are still ridiculously unreliable. Save everything three times on three different cartridges.

When to buy

Won't get much cheaper, but could be worth waiting to see if more software turns up. A maybe if the included business packages are all you'll need.

Enterprise 128

A Z80 based machine with 128K expandable almost infinitely. Centronics and serial interfaces for both printer connection and networking come as standard as does monitor and stereo hi-fi connections. The Enterprise has a specially designed sound chip to give it four quite powerful sound channels. The graphics chip is similarly specialised, capable of 672 by 512 pixels and 256 colours.

The Basic is fairly good and the large

48K Rom is extensive and well designed. The keyboard is a disappointment, however, being somewhat Spectrum + in style featuring flat plastic keys. An unusual feature is a built-in joystick which simulates cursor movement, but it is short and rather unreliable looking.

Software

Only from Enterprise. This machine has little independent support. Enterprise are doing quite a good job of releasing interesting software for the machine and the best of it is well up to Spectrum/Commodore standards.

Expandable?

Potentially very expandable. Enterprise provide Ram and disc drives and indeed the main slogan when the machine was launched was 'with obsolescence built out'. But a wide range of peripherals depends on the long-term success of the machine and that is in doubt.

Overall

A powerful well designed machine (except in the keyboard and looks department) that deserves to do well, but isn't really doing so at the moment.

When to buy

No imminent price drop likely. Worth watching to see how it fares over Christmas. It isn't dead yet, but warrants caution.

Bytes & Pieces

Joystick on C64 by Peter Graves

Embarrassment time - observant Commodore owners will have noticed that several lines of last week's Commodore listing were severely cut off in their prime. Our apologies - the full program is now in your possession.

```
100 REM JOYSTICK REGISTER OPERATION BY PETER GRAVES
110 POKE 646,1:POKE 53281,6:POKE 53280,6
120 GOTO 1000
130 PRINT "J":PRINT TAB(11) "JOYSTICK OPERATION"
140 PRINT TAB(7) " F J + I "
150 PRINT TAB(7) "BIT 7 6 5 4 3 2 1 0"
160 PRINT TAB(11) " "
170 PRINT TAB(11) " "
180 PRINT TAB(11) " "
190 PRINT TAB(7) "DECIMAL":PRINT "NOW OPERATE THE JOYSTICK IN PORT 1"
200 POKE 1410,(PEEK(56321)AND1)+48:POKE 1408,(PEEK(56321)AND2)/2+48
210 POKE 1406,(PEEK(56321)AND4)/4+48:POKE 1404,(PEEK(56321)AND8)/8+48
220 POKE 1402,(PEEK(56321)AND16)/16+48
230 PRINT " "TAB(15):PEEK(56321):=" PEEK(56321)":GOTO 200
1000 REM
1010 PRINT CHR$(142)
1020 PRINT " "
1030 POKE 52,48:POKE 56,48:CLR:POKE 56334,PEEK(56334)AND254:POKE 1,PEEK(1)AND251
1040 FOR I=0 TO 1023:POKE I+12288,PEEK(I+53248):NEXT I:POKE 1,PEEK(1)OR4
1050 POKE 56334,PEEK(56334)OR1:POKE 53272,(PEEK(53272)AND240)+12
1060 FOR N=12520 TO 12527:READ A:POKE N,A:NEXT
1070 FOR N=12504 TO 12511:READ A:POKE N,A:NEXT
1080 DATA 0,8,12,254,254,12,8,0
1090 DATA 0,24,24,24,126,60,24,0
1140 GOTO 130
```

Token exchange on Spectrum by S Martin

Token Exchange is a short machine code routine. Its main purpose is to exchange a specified token, ie *Print*, for another specified token, ie *LPrint*.

To use, the listing should be entered and then *Run*. If the OK message appears

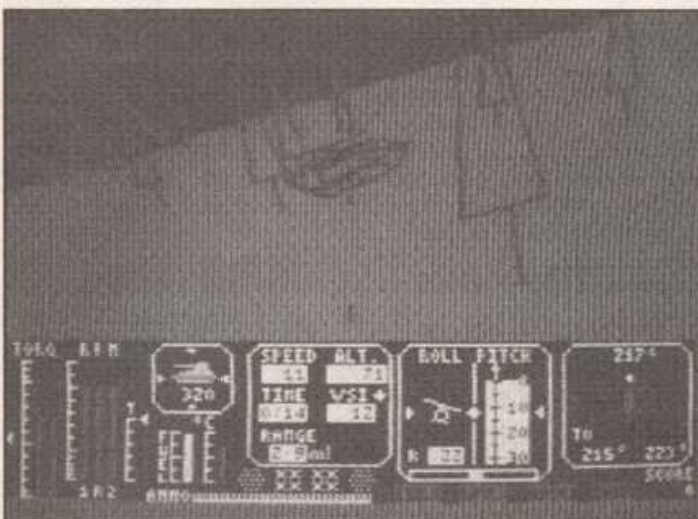
the code should be saved thus:
Save "token-ex" Code 65320,48

Now *Poke* 65358,CODE (token to be replaced) and *Poke* 65359,CODE (replacement token). Then *Randomize* *Usr* 65320. If all is well you should now have your Listing with your required replacement(s).

The routine should be loaded by *Clear* 65319 then *Load* "" Code.

Hence this very simple routine not only allows one to say replace *Print* statements with *LPrint* statements, etc., but also allows the programmer to cheat the Basic interpreter by entering lines such as 20 Rem 3,2 then calling the routine. One could have a line such as 20 Screen\$ 3,2 which is totally illegal.

```
5 REM 48k version
10 REM TOKEN EXCHANGE
15 REM BY S.MARTIN
20 REM GOING=65358
25 REM COMING=65359
30 CLEAR 65319
40 FOR a=65320 TO 65367
45 READ d
50 POKE a,d
60 NEXT a
70 DATA 42,75,92,237,91,83,92,237
75 DATA 82,229,193,42,83,92,58,78
80 DATA 255,87,126,186,40,8,35,11
85 DATA 120,177,32,246,201,118,58,79
90 DATA 255,119,24,242,118,118,0,0
95 DATA 118,118,118,201,0,0,0,0
100 REM RANDOMIZE USR 65320
```

Whirlybird

Program Tomahawk Micro
Spectrum **Price** £9.95
Supplier Digital Integration,
Watchmoor Trade Centre,
Watchmoor Road,
Camberley, Surrey GU15
3AJ.

Cue Ride of the Valkyrie. I'm swooping over a smoothly drawn 3D vector graphics landscape at 60 knots, just 20 feet above the ground. On the radar my computer indicates the course necessary to intercept the first enemy target. I swoop round, tilting dramatically, and head off into enemy

territory.

It's in sight and they're firing at me. I prepare to fire, tilt my nose down and KA-POW, KA-POW!

Tomahawk is Digital Intergration's sequel to *Fighter Pilot* and this time it's the turn of chopper pilots, with the US Army Advanced Attack Helicopter at their command. While conventional aircraft simulators are ten a penny on the Spectrum, this is distinctly different and it boasts the added adrenalin booster of armed combat. It's really most satisfying to be able to stop on an (airborne) sixpence, fire guns or guided missiles, suddenly drop... even fly backwards when you engage the enemy.

Controlling the machine is surprisingly simple. Just keep an eye on the relevant control panel and info, balancing the nose tilt with the collective (lift) to obtain movement and thanks to the ultra clear instructions you

too will soon be flying at Trainee level, though with the addition of crosswinds and infra red night flying, plus three higher levels there's plenty to keep you busy. Whether you choose joysticks or the keyboards the controls are easily picked up.

My only problem with the game was that it uses the much heralded anti-piracy system, Lenslok.

Tomahawk is likely to be the first available game to use it and as such Digital Intergration have learnt the hard way. In its initial form many people, myself included, found that it resulted in a maddening guessing game as time and time again we failed to identify the code. Sensibly Digital Integration immediately set out to modify the system. Providing it's sorted out the problem, Digital has a winner with Tomahawk.

John Minson



Choices

Program Multi-Basic Rom
Micro BBC Model B/B+
Price £39.95 **Supplier** Cambridge Microprocessor Systems Software, Unit 18, Industrial Estate, Chelmsford Road, Great Dunmow, Essex CM6 1XG

Usually the term multi-tasking evokes ideas of large business computers sorting huge databases whilst simultaneously running a word processing package. The *Multi-Basic* Rom, from CMS, may not be in this league but it certainly places some very useful tools at the Basic programmers' disposal.

The Rom provides a number of new commands which are designed to allow the user to write programs which appear to perform more than one task at a time, without resorting to machine code. Amstrad users have the command *Every* built into their Basic. This instructs the computer to stop whatever it is doing and perform a specific subroutine every so many seconds. Having performed the routine, the execution of the main program continues

from the place at which it was interrupted. The *Multi-Basic* Rom provides the BBC user with a similar command, plus much more.

The Rom is enabled using the command **Multi*, it doesn't devour any user Ram, but it does make extensive use of zero page. This will not trouble the Basic programmer, but should be born in mind by the machine code buff.

The pieces of code which the user wants to run as "background" routines must first be defined as *Tasks*. These can be thought of as *Procedures* which are specific to multi-Basic. The main two commands for calling these *Tasks* are *Every* and *Whenever*. *Every* performs a named task every n centiseconds. *Whenever* performs its task whenever a specified event occurs, eg, a key press.

The Rom is accompanied by an excellent 150 page spiral bound manual. This provides sufficient information to satisfy both expert and novice alike. The applications for such a piece of software are endless in both the home and industrial environments.

Jon Revis



Traditional

Program Souls of Darkon Micro
Any Amstrad CPC **Price** £7.95 **Supplier** Task Set Software, 13 High Street, Bridlington, YO16 4PR.

Task Set have produced some of my favourite arcade games, first for the Commodore and more recently for the Amstrad and Spectrum computers. This is the first adventure I have seen from then and I'm glad to say that I wasn't disappointed.

Technically it is rather a traditional affair, text and graphics with a predominantly simple verb/noun input. It also has a tendency to say 'You can't do that' a trifle too often (check out Melbourne House's *Morden's Quest* for a classic lesson in anticipating almost every possible input, together with a plausible explanation of *Why* you can't do something). Vocabulary and clues of a kind are available on request.

On a more positive note there are quite long and atmospheric passages of text, for once not sacrificed because of the graphics. The pictures are unusual in that

they are drawn in high res on a yellow background rather than using several colours. In fact they work well, have a character all of their own, and appear almost instantly.

I found the plot quite addictive, set on an alien world dominated by the evil Darkon using a kind of hybrid technology/magic.

It is your job to depose him



of course and in the early stages it will be a task of moderate difficulty. There are other characters there to help, although thankfully they don't sing or move around of their own accord.

Well worth the money for adventure fans and there is probably much more to it that I haven't seen yet. I know that Task Set rate it highly, and they have excellent standards.

Tony Kendle



Tally Ho

Program *Battle Of Britain*
Micro CBM64/Spectrum/
Amstrad/Atari **Price** £9.95
Supplier PSS, 452 Stoney
Stanton Rd, Coventry CV6
5BR.

In July 1940 the German High Command started preparations to invade England and christened the plans "Operation Sealion". The battle commenced in earnest on August 10th and went down in history as one of the most courageous of WWII; it resulted in the defeat of the German Luftwaffe, and the cancellation of "Operation Sealion".

Now it's your chance to relive those glorious days, chaps, so get out the false handlebar moustaches, check out the old Spitfire and commence to do battle.

PSS are old hands at this type of computer wargames, combining strategy with a certain amount of arcade ac-

tion. The strategic level of the game is played on a map depicting the South East/West of England and Northern France; you are in control of Fighter Command and your task is to deploy squadrons of Spitfires and Hurricanes against the incoming squadrons of the Luftwaffe. You must bear in mind such things as limited flying time, ammunition, availability of landing strips to refuel and the size of the invading squadrons, which usually consist of bombers and fighters.

Movement of your forces is joystick controlled, done by moving a white box around the screen and covering a graphic symbol, eg, aeroplane, radar base, etc, and pressing the fire button. An instant readout is flashed onto the screen informing you which squadrons are ready to 'scramble' and the strength of the base. Once scrambled you can move the squadron anywhere on the map to intercept the German forces; messages will tell you when the

fighters need to refuel or when a squadron is lost.

A certain amount of tactical play must be adopted to be successful, positioning your forces at the correct points of interception is crucial. On interception you can choose whether to play the arcade sequences or not, I found them rather repetitious and was glad I had a choice.

There are three levels of play, the Training game, Blitzkrieg and the very challenging Campaign game; the latter is played over 30 days

with the option to save each day's play - excellent when you've just finished fighting off 300 aircraft.

I found the game well presented with clear, concise instructions and able to generate the right mental feeling, which made me, on seeing one rather large invasion force, cry out in desperation. Certainly a game that will make your head hurt and your hands sweat.

Roger Garrett



Face to face

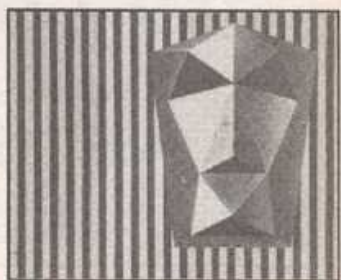
Program *I, of the Mask*
Micro Spectrum **Price** £6.95
Supplier Electric Dreams
Software, 31 Carlton Cres-
cent, Southampton, Hamp-
shire SO1 2EW.

Shouldn't that be Me, of the Mask? No worry, because this is as much an enigma as its author, Scottish sculptor Sandy White, who first came to fame with *Ant Attack*.

Now he's back. This time your tiny figure has been consigned to a giant maze to undergo a testing. He runs around these corridors, which are obviously not the corridors of power - just look at the energy drain - until he comes to a junction where he encounters three crystals. With limited ammunition he can shoot one for a long distance teleport, one for a short hop and the third reveals part of a robot that must be assembled from the feet first by shooting the relevant section three times.

While the corridor graphics aren't 100% smooth the

effect of the madcap charge round the maze is aided by the frantic animation of the figure. But there's little to do



in the corridors, with the game almost steering itself. My first reaction was disappointment. Then I began to look at it from a different perspective. Seen as a strategy puzzle *I, of the Mask* makes more sense. You have to figure out where the nearest crystals are, where the teleports will take you, where the robot sections are, and all within the power constraints.

I'd only recommend this with reservations. Sandy's Solid Soft techniques no longer look so novel but the more cerebral puzzler may like it. As I said, an enigma.

John Minson



Flip out

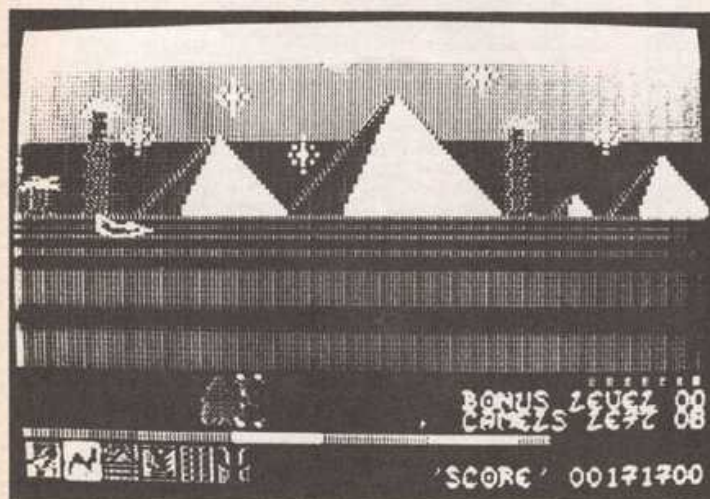
Program *Batalyx* **Micro**
Commodore 64 **Price** £8.95
Supplier Ariolasoft Retail

Yes folks, softwares' answer to Neil from the *Young Ones*, that age old psychedelic hippie Jeff Minter is back from semi retirement, and, presents us with another weird and wonderful, colourful extravagan-

and excellent music.

Batalyx is really six games in one. A game system, if you like, and after setting the time duration - from an hour down to five minutes - you can, by pressing 1-6, skip from one game to another as the mood takes you and the scoring is carried across from one segment to the next.

Game one is called *Hallucin-O-Bomblets* and has a little robot droid trying to take out all manner of strange shaped aliens - smashing



za full of the usual Minter touches and copious notes

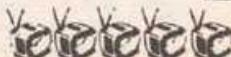
stuff. The next game is an updated version of *Attack of*

the *Mutant Camels*, game three puts you on the back of one of those camels riding toward its pyramid base trying to activate it by following a trail of spheres, a test for your reactions here. On to *Chippy on the Run* - very strange this one - all about painting walls (*Q-bert* style) and zapping lights, oh well... next comes my favourite, *Syncro II* which presents us with bouncing spheres and a bunch of col-

oured grids with rotate. The idea is to make the spheres come to a halt by skillfully changing the speed of selected grids which alters the flight pattern of the spheres.

Finally is a version of *Psychedelia* that superb program that lets you do just about anything with patterns set to music. Select this as a breather between bouts!

Andy Moss



PPC

****SPECTRUM****

GAME	RRP	OUR PRICE
GEOFF CAPES	7.95	5.45
WHAM MUSIC BOX	9.95	7.00
THEY SOLD A MILLION	9.95	7.00
EVIL CROWN	9.95	7.00
CODENAME MAT II	8.95	6.25
MORTY ON THE RUN	7.95	5.45
I OF THE MASK	9.95	7.00
INTERNAT BASKETBALL	7.95	5.45
INTERNAT KARATE	6.50	4.00
IMPOSSIBLE MISSION	7.95	5.45
F. BRUNO'S BOXING	8.95	4.75
DALEY'S SUPERTEST	6.95	4.75
BOUNTY BOB	7.95	5.45
NOW GAMES	8.95	6.25
ADRIAN MOLE	9.95	7.00
ASTROCLONE	7.95	5.45
ROBIN OF THE WOOD	9.95	7.00
CRITICAL MASS	8.95	6.25
HYPERSPORTS	7.95	5.45
HALL OF FAME	9.95	7.00
BATTLE OF THE BULGE	9.95	7.00
BACK TO SCHOOL	6.95	4.75
WATERLOO	9.95	7.00
BEACHHEAD II	7.95	5.45
FAIRLIGHT	9.95	7.00
ROBIN OF SHERWOOD	9.95	7.00
SABOTEUR	8.95	6.25
RED MOON	6.95	4.75
HIGHWAY ENCOUNTER	7.95	5.45
HACKER	7.95	5.45
FIGHTING WARRIOR	7.95	5.45
MARSPORT	9.95	7.00
GYROSCOPE	7.95	5.45
ELITE	14.95	10.50
POPEYE	6.95	4.75
INTERNAT RUGBY	7.95	5.45
BORED OF THE RINGS	6.95	4.75
ROBIN OF SHERLOCK	7.95	5.45
TAUCETI	9.95	7.00
STARQUAKE	7.95	5.45
NEVERENDING STORY	9.95	7.00
ROTHMANS FOOTBALL QUIZ	8.95	6.25
SEAS OF BLOOD	9.95	6.00
SWORDS OF SORCERY	9.95	6.75
XCEL	7.95	5.45
TOMAHAWK	9.95	7.00
ROBOT MESSIAH	7.95	5.45
ZOIDS	7.95	5.45
WINTER SPORTS	9.95	7.00
SWEET'S WORLD	7.95	5.45
YIE AR KUNG FU	7.95	5.45
ARENA	9.95	7.00

****COMMODORE****

THEY SOLD A MILLION	9.95	7.00
HALL OF FAME	9.95	7.00
KENNEDY APPROACH	14.95	11.00
BATTLE FOR BRITAIN	9.95	7.00
SCHIZOPHRENIA	7.95	6.00
SUPER ZAXXON	9.95	7.00
FRANK BRUNO	7.95	6.00
FRANK BRUNO (disk)	14.95	10.00

GAME	RRP	OUR PRICE
STARON	9.95	7.00
WHO DARES WINS II	7.95	5.45
SCARABEUS	9.95	7.50
SCHOOLDAZE	6.95	4.75
HENRY & FRIENDS II	6.95	4.75
ADRIAN MOLE	9.95	7.00
FIGHTING WARRIOR	9.95	7.00
ROBIN OF THE WOOD	9.95	7.00
SUMMER GAMES II	9.95	7.00
PARADROID	7.95	6.50
ELITE	14.95	10.50
FAULKLANDS 82	9.95	7.00
IMNHOTEP	9.95	7.00
FIGHT NIGHT	9.95	7.00
RAMBO	6.95	6.25
SCALELECTRIX	12.95	9.50
NEVERENDING STORY	9.95	7.00
ELECTRASOUND	14.95	10.00
BEACH HEAD II	9.95	7.00
HYPERSPORTS	8.95	6.25
ROBIN OF SHERWOOD	9.95	7.00
THEATRE EUROPE	9.95	7.00
BATTLE OF THE BULGE	9.95	7.00
TERROROLINDS	6.95	4.75
RED MOON	6.95	4.75
SKYFOX	9.95	7.00
CODENAME MAT II	8.95	6.25
BALATA	9.95	7.00
WINTER GAMES	8.95	7.00
SPACE PILOT II	7.95	5.45
RACING DESTRUCTION SET	12.95	9.50

****AMSTRAD****

3D BOXING	9.95	7.00
3D BOXING (disk)	13.95	10.50
GRAND PRIX	9.95	7.00
GRAND PRIX (disk)	13.95	10.50
SOULS OF DARKON	8.95	6.00
SOUTHERN BELLE	8.95	6.00
BRUNO BOXING	8.95	6.00
BRUNO BOXING (disk)	13.95	10.50
BATTLE FOR BRITAIN	9.95	7.00
HYPERSPORTS	8.95	6.25
SPY VS SPY I	9.95	7.00
ADRIAN MOLE	9.95	7.00
SORCERY	8.95	6.25
QUILL	16.95	12.50
ILLUSTRATOR	16.95	12.50
THEY SOLD A MILLION	9.95	7.00
THEY SOLD A MILLION (disk)	14.95	10.00
GLEN HODDLE'S SOCCER	8.95	6.25
CAULDRON	8.95	6.25
BOUNTY BOB	9.95	7.00

ALL AMSTRAD DISKS & UTILITIES ARE IN STOCK
BOX OF TEN DISKS 35.00

ALL PRICES INCLUDE P&P
OVERSEAS ORDERS ADD £1.00 P&P

ANY TITLES NOT SHOWN CAN BE SUPPLIED
AT 25% OFF RRP. PLEASE MAKE CHEQUES/POs PAYABLE TO: PPC AND SEND TO:

PPC MAIL ORDER
9 BENNECK HOUSE, 100 TOLPITS LANE
WATFORD, HERTS WD1 8PZ
(0923 43855)

PPC Guarantee that all products will be delivered within 7 days of receiving order or cheques will not be cashed until products are despatched

PD614

IS IT A
DEFENDER
OF THE WEAK?
NO!
IS IT A
CHAMPION OF
THE DOWN
TRODDEN?
NO!

IT'S THE MOST COWARDLY
PANIC STRICKEN
GERIATRIC EVER TO
WEAR A STORE
DETECTIVES
UNIFORM.



KEEP YOUR EYES OPEN
FOR GRUMPY GUMPHREY
SUPER SLEUTH

COMING SOON FROM

Gremlin Graphics

+ SUPER BREAKER +

+++ EXTRA +++

CONTAINS TWO GREAT UTILITY DISKS: SUPER BREAKER
& SUPER BREAKER-PLUS (TOTAL OF 7 UTILITIES)

This great offer includes a multitude of useful utilities:
Turbo Breaker-II, Turbo Breaker Plus, Arrowfile-II, Super
Diskopy, Transfer-II, Disk Doctor and Turbo Menu Maker in one
package representing unbeatable value.

TURBO BREAKER PLUS: This all new package transfers many
of the games not covered in Turbo Breaker-II. Transfers:
Nearly all Novaloads, Firebird, new Mastertronic, Beyond,
Leisure genius and many more individual files.

TURBO BREAKER-II: This package will transfer: Pavloader,
Burner, Activision, Ariola and many more.

MENU MAKER: will make menu on your disk with an option to
turbo load from disk.

TRANSFER-II: Transfers nearly all slow load programmes.

SUPER DISKOPY: Copies unprotected disks in 3 minutes and
also copies many protected disks in 6 minutes.

ARROW FILE-II: A filing programme that allows you to read
disk directories straight into the file so that you can keep
a record of all your disk software.

DISK DOCTOR: Disk editing utility that allows you to edit
any block on the disk. Also include scratched file recovery
and directory editing facilities.

ALL THESE GREAT UTILITIES ON TWO DISKS FOR A MERE £27.00

Separate: Super Breaker..Menu Maker, Turbo breaker-II,
Super Diskopy, Transfer-II...£22.00
Super Breaker+..Turbo Breaker+..Disk doctor,
Arrowfile-II£15.00

ARROW MICRO SERVICES

CBM 64

20 Portmeadow Walk
London SE2

CBM 64

Before your very eyes

The final helping of this fast save/load routine on Spectrum from John Pickford

From last week, you should now have two programs saved to tape - the turbo load and turbo save routines. Now type in Program Three (below) and save it with, save "HEADER" Line 9999.

Right; now you're ready to test it. First find an old game with a loading screen (Atic Atac will do). We'll use the loading screen because it's easy to see if anything goes wrong. Now load in Program Three followed by the turbo-save routine (program one last week). Enter 16384 for the start address and 6912 for the length. Enter anything you like for the filename, it won't make the slightest bit of difference. For those of you with no imagination try "A Loading Screen", which, by sheer coincidence, is 16 characters long (the maximum length of a

filename).

Now insert the cassette with the game on it and press play. When the screen picture has loaded the border will go all funny and the computer will make a buzzing noise, do not worry, this is normal. Now insert a blank cassette in your datarecorder, press Play Record, then any key on the computer. If everything has gone well the screen should be saved to tape at double speed.

To load it back, reset the machine, type Clear 65214 and load in the turbo-load routine (Program Two last week). This is the moment of truth (exciting isn't it?), type Randomize Usr 65215:Pause O. If you haven't made a mistake then you should now see the message "Searching ... " at the bottom of the screen. Now insert the cassette with the newly re-

corded loading screen and press Play. After a few seconds you should see the message "Found:- A Loading Screen Loading" and the screen\$ will load before your eyes at twice the normal speed.

The sequence described above can be used to save any code file (not Basic). All you need to know is the length and start address of the file. To convert some commercial software you may need a 'Tape Header Reader', which can be found in most Tool-Kit programs. You may also have trouble with programs which use memory above address 65214, because the code overlaps the Save & Load routines. This can be solved by loading the code into a lower address and then moving it up with a simple machine code program.

If you can't be bothered to type in all the listings, I would be happy to supply you with a copy of all the routines for £2.50 (cassette) or £4.50 (microdrive). Send cheques to J Pickford, 11 Oldham Avenue, Stockport, SK1 4BG.

```

1 REM Program Three
2
3 REM1985 J.Pickford
4
5 REM  HEADER MAKER
6
7
8
9
10 PAPER 0: BORDER 0: INK 7: CLS
11 INPUT "Start Address of file? ";sa: RANDOMIZE sa:
12 POKE 23312,PEEK 23670: POKE 23313,PEEK 23671: PRINT ""
13 START ADDRESS:";sa: BEEP .1,1
14 INPUT "length of file? ";le: RANDOMIZE le: POKE 23
15 314,PEEK 23670: POKE 23315,PEEK 23671: PRINT ""
16 LENGTH:";le: BEEP .1,1
17 DIM n$(16): INPUT "Filename?"; LINE n$: FOR f=1 TO
18 16: POKE (23295+f),CODE n$(f): NEXT f: PRINT "" F
19 ILENAME:";n$: BEEP .1,1
20 100 PRINT "" *LOAD FILE FROM TAPE*: LOAD ""COD
21 E sa
22 150 FOR f=1 TO 4e4: OUT 254,PEEK 23672: BORDER 1: IF I
23 NKEY$="" THEN NEXT f
24 200 IF sa=16384 THEN PRINT £0;AT 1,0; INK 8; PAPER 8;
25 "FOUND:- ";n$;" LOADING"
26 300 RANDOMIZE sa: LET 1=USR 65215
27 9998 STOP
28 9999 CLEAR 65215: PRINT "LOAD TURBOSAVE ROUTINE": LOAD
29 ""CODE : RUN

```




This boy is a fugitive.



This girl is dangerous.



This lady is deadly.



This man is harmless.



Menu manipulation

The first of three parts of a comprehensive database for the 64 - by W Sabbagh

Com File is a sophisticated file system that can be used in the home or by small business users, who wish to put their C64 to practical use.

Com File can be used by disc or tape owners. Disc users can however make use of the maximum power of the program. Although a printer is not essential, it can prove useful, especially for the business user. Com File is simply a data manipulation program.

After the data structure has been defined, users of Com File can print, save, sort, search and view this data. The program also comprises a mathematical menu for calculations.

No computer knowledge is necessary, as Com File is error proof (using the Com File error screen). Mistakes can usually be easily corrected from instructions on the screen.

The program

Com File is controlled by two primary

menus, which in turn lead to secondary menus (up to three levels). Although this may sound difficult to use, in practice it only takes minutes to learn how to use the program.

The first of the primary menus is concerned with defining the file format, although a format defined previously can be loaded from disc or tape separately.

The second primary menu is concerned with manipulating the data file. Several options are offered, most of which lead to their own secondary menus (such as printer menu, save/disc house-keeping menu, or calculation menu).

More instructions and listing next week.

```

10 REM *****
20 REM *
30 REM * COM FILE SYSTEM *
40 REM *
50 REM * (C) WAIL SABBAGH -1985- *
60 REM *
70 REM *****
80 POKE$3280,0:POKE$3281,0:PRINT"BI"
90 PRINT"J"
100 REM*****MENU *****
110 PRINT"J"
120 PRINT"JWELCOME TO COM FILE SYSTEM FOR CBM 64"
130 PRINT"J"
140 PRINT"J"
150 PRINT"JCENTRAL MENU"
160 PRINT"J"
170 PRINT"J"
180 FORX=1TO5
190 PRINT"J"
200 NEXT
210 PRINT"JII*****OPEN A NEW DATA FILE"
220 PRINT"J"
230 PRINT"J"
240 PRINT"J"
250 GETAF
260 IFAS="1"THEN300
270 IFAS="2"THEN1000
280 GOTO250
290 REM*****OPEN A NEW DATA FILE**
310 PRINT"J"
320 PRINT"J"
330 PRINT"JOPTION 1 SELECTED..OPEN A NEW FILE"
340 PRINT"J"
350 PRINT"J*****ENTER NAME OF DATA FILE -MAX 10 CHAR-"
360 INPUT"J",N$
370 IF LEN(N$)<1ORLEN(N$)>10 THEN300
380 PRINT"J*****NO. OF FIELDS -MAX 20 FIELDS-"
390 INPUT"J",N$
400 IF N$<2ORN$>20THENPRINT"*****":GOTO300
410 PRINT"J*****FORX=1TO10:PRINT*****";
411 PRINT"J";NEXT
415 PRINT"J*****DO YOU REQUIRE A PASS WORD (Y/N)J.C"
420 GETAF
430 IF AS="N"THENN$="COM SALAM":GOTO500
440 IF AS="Y"THEN460
450 GOTO420
460 PRINT"J*****PASS WORD -MAX 12 CHAR-*****"
470 INPUT"J",P$
480 IF LEN(P$)<1ORLEN(P$)>12THEN410
490 PRINT"J*****";
500 PRINT"J*****";NEXT
510 PRINT"J*****IF=4 J(NF+1)*****"
520 PRINT"J*****ENTER MAX NUMBER OF RECORDS IN FILEJ.C"
530 DIM#(RE,NF),F$(NF),EX$(NF),EX$(NF)
540 FORF=1TO NF
545 PRINT"J*****FORX=1TO10:PRINT*****";
550 NEXT
550 PRINT"J*****FIELD NO J.F"
560 PRINT"J*****FIELD TITLE -MAX 10 CHAR-*****"
570 PRINT"J*****";F$(F)
580 IF LEN(F$(F))<1ORLEN(F$(F))>10THEN550
590 NEXTF
600 COUNTER=0:REN NO OF ENTRIES
700 GOTO 2000
1000 REM *****LOAD*****
1020 PRINT"J*****LOAD DATA*****"
1030 PRINT"J"
1040 PRINT"J"
1050 PRINT"J*****PLEASE SELECT CHOICE*****PRINT"
1060 PRINT"J*****VIEW DISK DIRECTORY*****PRINT"
1070 PRINT"J*****LOAD FILE FROM DISK*****PRINT"
1080 PRINT"J*****LOAD FILE FROM TAPE*****PRINT"
1090 PRINT"J*****RETURN TO MENU*****PRINT"
1100 GET AF:IFAF<"1"ORAF>"4"THEN 1140
1110 A=VAL(AS):ON A GOTO 1200,1300,1400,10
1200 RO=1:GOSUB 6000:RO=0:GOTO 1000
1300 PRINT"J*****DISK*****"
1310 PRINT"J"
1320 PRINT"J"
1330 PRINT"J*****NAME OF FILE TO LOAD"
1340 PRINT"J*****";N$
1350 OPEN1:0,0,"R":CLOSE1:GOSUB 1900
1360 OPEN2:0,2,"R":N$+";S,R":CLOSE2:GOSUB 1900
1365 OPEN2:0,2,"R":N$+";S,R"
1370 JNV=0
1380 GOTO 1600
1400 PRINT"J*****TAPE*****"
1410 PRINT"J"
1420 PRINT"J"
1430 PRINT"J*****NAME OF FILE TO LOAD*****PRINT*****RETURN TO LOAD FIRST FILE"
1440 PRINT"J*****";N$
1450 OPEN2:1,0,N$
1470 JNV=1
1480 GOTO 1600
1600 INPUT2,N$
1610 INPUT2,P$:IFP<"O"COM SALAM"THEN GOSUB 1800
1620 INPUT2,RE
1630 INPUT2,NF
1640 INPUT2,C:DIM#(RE,NF),ER$(NF),ER$(NF),F$(NF)
1645 FORC=1TONF:INPUT2,F$(C):NEXTC
1650 FOR X=1TOC
1660 PRINT"J*****LOADING RECORD *****";X
1670 FORV=1TONF
1680 INPUT2,RE(X,V)
1690 NEXTV,X:CLOSE2:IFP="COM SALAM"THENP$="COM SALAM"
1700 IFV=8THEN GOSUB 1900
1705 IF P$<"O" THENPRINT"*****ILLIGAL ENTRY TO *****END"
1710 GOSUB 60500
1720 GOTO 2000
1800 PRINT"J"
1910 PRINT"J*****CON PASS WORD*****"
1915 PRINT"J*****"
1930 PRINT"J*****IS PROTECTED*****"
1940 PRINT"J*****ENTER USER PASS WORD*****"
1950 INPUT"J",P$
1960 IF P$<"O" THEN GOTO 1800
1970 RETURN
1980 OPEN1:0,15:INPUT15,ER$:CLOSE15:IF ER=0THEN RETURN
1910 RO=1:ER$="*****DISK ERROR *****"
1920 GOTO 10000
2000 REM*****CONTROL MENU*****
2010 PRINT"J"
2015 PRINT"J"
2020 PRINT"J*****COM FILE SYSTEM (C) 1985 V3.2 *****"
2025 PRINT"J*****N$*****ENTRIES*****":COUNTER
2030 PRINT"J*****";J:=FRE(0)
2040 PRINT"J*****";
2050 FORX=1TO10
2060 PRINT"J*****";
2070 NEXTX
2080 PRINT"J*****";
2090 PRINT"J*****";
2100 PRINT"J*****ENTER NEXT RECORD"
2110 PRINT"J*****READ/SEARCH MENU"
2120 PRINT"J*****PRINTER OUTPUT MENU"
2130 PRINT"J*****LOAD/OPEN NEW FILE MENU"
2140 PRINT"J*****SORT DATA FILE"
2150 PRINT"J*****SAVE DATA FILE"
2155 PRINT"J*****EDIT MENU"
2160 PRINT"J*****CALCULATION MENU"
2170 PRINT"J*****EXIT COM TO BASIC"
2175 REM PRINT:PRINT"*****DEPRESS KEY TO SELECT*****"
2180 GET AF
2190 IFAF<"0"ORAF>"9"THEN 2100
2200 A=VAL(AS):IF A=0 THENA=10
2210 ON A GOTO 3000,4000,5000,6000,7000,8000,11000,13000,12000,9000
3000 REM*****OPTION 1*****
3010 PRINT"J"
3020 PRINT"J*****OPTION 1*****":COUNTER+1
3030 PRINT"J*****";
3040 PRINT"J*****"
3050 COMCO=1:IF COMRE THENCO=CO-1:ER$="FILE FULL TO CAPACITY":GOTO 10000
3060 FOR X=1TONF:PRINT
3070 PRINT"J*****";INPUT#(CO,X)
3080 NEXTX
3090 GOTO 2000
4000 REM*****OPTION 2*****
4020 PRINT"J*****OPTION 2*****":READ/SEARCH*****"
4030 PRINT"J*****";
4040 PRINT"J*****";
4050 PRINT"J*****PLEASE SELECT CHOICE*****"
4060 PRINT"J*****"
4070 PRINT"J*****DISPLAY RECORD BY:ND*****PRINT"
4080 PRINT"J*****READ BLOCK OF FILE*****PRINT"
4090 PRINT"J*****SEARCH THROUGH FILE*****PRINT"
4100 PRINT"J*****SUBSEARCH THROUGH FIELD*****PRINT"
4110 PRINT"J*****BROWSE THROUGH FILE*****PRINT"
4120 PRINT"J*****"
4125 GET AF
4130 IF AF<"1" OR AF>"5"THEN 4125
4140 A=VAL(AS):22=0
4150 ON A GOTO 4200,4250,4350,4500,4800,2000
4200 PRINT"J"
4210 PRINT"J*****ENTER RECORD NO TO DISPLAY*****C"
4220 PRINT"J*****";N$

```


CHRISTMAS MICROFAIR



Looking forward to a high-tech Christmas?
Then come along to the CHRISTMAS MICROFAIR at the Horticultural Hall, London SW1 on the 14th December.
It's enough to make even Santa Claus's eyes light up.
Everything you ever wanted for the ZX Spectrum, Spectrum + and the QL under one roof, in one day of non-stop computer entertainment.
Software, hardware, books, add-ons, printers, monitors, user clubs, magazines, computers, and a fantastic range of gizmos that are not generally available in the shops.
There's all those 'just released' programs for the Spectrum and QL, and more than one opportunity of getting something at special "show" prices.
Send for reduced-price advance tickets now.

CHRISTMAS MICROFAIR
DECEMBER 14TH 1985, HORTICULTURAL HALL
GREYCOAT STREET / ELVERTON STREET LONDON SW1
10am - 6pm
ADMISSION: £1.75 (ADULTS); £1.25 (KIDS UNDER 14yrs)

SEND FOR REDUCED PRICE ADVANCE TICKETS TODAY

Send to Mike Johnston (Organiser), Dept PCW ZX MICROFAIRS,
71 Park Lane, London N17 0HG.

Please send me _____ advance tickets
(Adult @ £1.25)

Please send me _____ advance tickets
(Child under 14 @ £1.00)

Name: _____

Address: _____

Please include a stamped, self-addressed envelope and make cheques/POs payable to ZX Microfair

EXHIBITORS. CALL MIKE JOHNSTON ON 01-801 9172
FOR DETAILS OF STAND AVAILABILITY.

17th
ZX MICROFAIR

TAPE and DRIVE SPECTRUM and AMSTRAD UTILITIES

All our programs carry:

- * A FULL MONEY BACK GUARANTEE * FULL MANUALS
- * AN UPDATE SERVICE

***** SPECTRUM *****

TC7 - ALL SPECTRUM OWNERS NEED this specialist tape utility. Send SAE for FULL DETAILS of this AMAZING program.

- * Integral Header reader. Baud rate measurer.
- * Handles high speed or jerky parts - converts to normal for study/driver transfer.
- * Handles Headerless parts etc, etc, etc. Available with MT6 - a special m/driver program.

TC7 on tape £6.50 (or £7.50 with MT6). On cartridge £9.99 (inc MT6).

TAPE to DRIVE transfer for SPECTRUM OWNERS

You need our MD1b (for m/driver) or WD1b (for Wafa/disc drive). They have the tools to convert programs to make them + other utilities. For latest programs you will also need TC7. MD1b or WD1b on tape £6.99.

LERM information sheets - £1 each - up to to number 5 available. Each sheet tells you how to transfer 8 specific POPULAR programs to your drive using our software. MUST send SAE

TRANSFER PACK - everything you need - TC7 + MD1b + MT6 on cartridge + information sheets 1-3 all for £15.50. (Other drive owners get a similar pack with the programs on tape + sheets for same price.)

***** AMSTRAD *****

TAPESPEED ONE (TS1) - ESSENTIAL FOR ALL 464 + 6128 OWNERS. Convert your slow loading software from 1000 to a max of 3600 baud. Stop and study programs.

- * Fully automatic. Handles continuously up to 44k.
- * Save at range of 9 speeds. Header reader + Status.
- * Handles HEADERLESS files, Spectrum loaders etc, etc.

PRICE ONLY £6.50 - state 464 or 6128

DISC MANAGER ONE - for CP 464 or 6128 (state which). Essential to help you manage your AMSTRAD drive.

- * Does a CAT to TV or printer. Easy REPEAT ERASURES.
- * 2 Discs editors. Recover ERASED files. Menu driven.
- * Simple and fast whole disc or sector BACKUP copier.

PRICE ONLY £5.99 - amazing!

THE PRICES QUOTED ARE ALL INCLUSIVE EXCEPT overseas: add £1 within Europe, £1.50 others. SAE for more information.

LERM, DEPT PCW, 10 BRUNSWICK GDNS, CORBY, NORTHANTS NN18 9ER

PL08

GOODE BYTE

SPECTRUM

GAME	RRP	PRICE
FRANKIE G. T. HOLLYWOOD	9.95	6.99
GRAHAM GOOCH'S CRICKET	9.95	6.99
SPY vs SPY	9.95	6.99
DUN DURACH	9.95	6.99
EXPLODING FIST	9.95	6.99
NEVER ENDING STORY	9.95	7.45
HYPERSPORTS	7.95	5.50
FIGHTING WARRIOR	7.95	5.50
TAU CETI	9.95	6.99
GYROSCOPE	7.95	5.50
AZIMATE 3000	4.99	3.95
FAIRLIGHT	9.95	7.50
BC QUEST TYRES	7.95	5.95
HACKER	7.95	5.95
MARS PORT	9.95	7.50
BORED OF THE RINGS	6.95	5.25
MONTY ON THE RUN	7.95	5.95
RED MOON	6.95	5.25
NICK FALDO'S OPEN	9.95	7.50
BATTLE OF THE BULGE	9.95	7.50
IMPOSSIBLE MISSION	7.95	5.95
DYNAMITE DAN	6.95	5.25
THAT'S THE SPIRIT	6.95	5.25
FAIRLIGHT	9.95	7.50
SOUTHERN BELLE	7.95	5.95
SS COMPILATIONS (PSS)	4.99	3.75
INTERNATIONAL KARATE	6.50	4.25
FRANK BRUNO'S BOXING	6.95	5.25
DALEYS SUPERTEST	6.95	5.25
PROFINATION	7.95	5.95
CODENAME MAT II	8.95	6.75
TERREMOLINOS	6.95	5.25
DOOMDARK'S REVENGE	9.95	7.50
SHADOW OF UNICORN	14.95	11.70
ELITE	14.95	10.25
ROBIN OF SHERLOCK	7.95	5.50
ROBIN OF THE WOOD	9.95	6.99
SEA'S OF BLOOD	9.95	6.99
SWORDS OF SORCERY	9.95	6.99

COMMODORE

FRANKIE G. T. HOLLYWOOD	9.95	7.50
WAY OF EXPLODING FIST	9.95	7.50
WINTER GAMES	9.95	7.45
FIGHTING WARRIOR	8.95	6.70
RACING DESTRUCTION (cassette)	12.95	9.70
BATALYX	9.95	7.45
GRAHAM GOOCH'S CRICKET	9.95	7.50
HYPERSPORTS	8.95	6.75
THEATRE EUROPE	9.95	7.50
BATTLE OF BRITAIN	9.95	7.45

GAME	RRP	PRICE
SPY vs SPY	9.95	7.50
TERREMOLINOS	6.95	5.25
SKYFOX (cassette)	9.95	7.50
WIZARDRY	9.95	7.50
IMHOTEP	9.95	7.45
CODENAME MAT II	8.95	6.75
HACKER	9.95	7.50
WORLD SERIES BASEBALL	7.95	5.95
NEVER ENDING STORY	9.95	7.45
RED MOON	6.95	5.25
NICK FALDO'S OPEN	9.95	7.50
BATTLE OF THE BULGE	9.95	7.50
THING ON A SPRING	7.95	5.95
BEACH HEAD II	9.95	7.50
PARADROID	7.95	5.95
WIZZARDS AIR	8.95	6.75
MONTY ON THE RUN	9.95	7.45
FRANK BRUNO'S BOXING	7.95	5.95
NODES OF YESOD	9.95	7.50
PSI WARRIOR	9.95	7.50
THEY SOLD A MILLION	9.95	6.99
WHAM MUSIC BOX	9.95	6.99
WIZARD	9.95	6.99
THE LITTLE COMPUTER PEOPLE	9.95	6.99

AMSTRAD

COMBAT LYNX	8.95	6.75
SABREWOLF	9.95	7.45
EXPLODING FIST	9.95	7.50
DUMMY RUN	9.95	7.45
VIEW TO A KILL	10.99	8.99
SORCERY	8.95	6.75
DARK STAR	7.95	5.95
MATCHDAY	8.95	6.70
DUN DURACH	9.95	7.50
RED ARROWS	9.95	7.50
W.S. BASEBALL	8.95	6.70
ALL AMSOFT DISKS	12.95	9.95
THEY SOLD A MILLION	9.95	6.99
GEOFF CAPES	8.95	5.99
FIGHTING WARRIOR	8.95	5.99
TERREMOLINOS	7.95	5.50

MSX

HYPER SPORTS 1 KONAMI	14.95	11.00
HYPER SPORTS 2 KONAMI	14.95	11.00
TRACK FIELD 1 KONAMI	14.95	11.00
TRACK FIELD 2 KONAMI	14.95	11.00
SKY JAGUAR KONAMI	14.95	11.00
TENNIS KONAMI	14.95	11.00

SPECIAL OFFER QUICKSHOT II £6.50

ALL PRICES INCLUDE P&P

PLEASE NOTE IF OUR ORDER EXCEEDS £50

YOU GET 10% FURTHER DISCOUNT

SEND CHEQUES/P.O. TO

GOODEBYE PCW10

UNIT 10-11, IMPERIAL STUDIOS,

IMPERIAL, LONDON SW6

(TEL: 01-731 4807)

PD359A

Speech generator

Sound sampling on Amstrad - Paul Hardcastle impressions made easy by **Brian Cadge**

The program presented here allows you to add speech synthesis easily to any Basic program - no extra hardware is required and the program will run on any Amstrad CPC. The method used to generate speech is that of 'Digital Recording'. The advantage of this technique over allophone methods is that the 'accent' of the speech can clearly be heard - for example, a male voice is clearly distinguishable from a female voice. The disadvantage of this method is that it is relatively expensive in terms of memory usage.

Program notes

The speech is sampled (recorded) from the cassette deck (built in on the 484, external on the other machines) and is reproduced by software using channel B of the sound chip - this gives equal output to left and right speakers if played back through a stereo amplifier. To use the program, type in the basic loader program - taking care with the data statements. If you have made no mistakes then two new RSX commands are added to Basic, these are **RECORD** and **REPLAY**.

The **RECORD** command has the following

format; **RECORD, start, length** where 'start' is the address from where incoming data is to be stored, and 'length' is the number of bytes to be stored. As the program itself sits at the top of Ram from 42000 onwards, a good place to start putting data is at 30000 - remember to lower HIMEM first. For example, record yourself saying "3-2-1 Popular Computing" on cassette - the louder and clearer the better - put this tape in the Amstrad tape deck and type the following; **MEMORY 29999: RECORD,30000,10000**.

The cassette motor is turned on and a message to 'Press Enter to start recording' is displayed - this is to enable you to position the tape ready to input the speech. As you hear "one", press Enter and the sound from the cassette will be sampled and stored in Ram.

Now to replay this sound use the **REPLAY** command as follows; **REPLAY,30000,10000** and you should be able to recognize yourself saying "Popular Computing" fairly clearly. **Replay** can also take a third optional parameter to specify volume. If this is left out, as in the example above, then a default value of seven is assumed, but you may specify any volume from 0 to 15, try; **REPLAY,30000,10000,15**, and you will hear "Popular Computing" at twice the volume.

It soon becomes apparent that the more sound you wish to store, the more Ram it uses. In fact, about one second of speech uses about 1K of Ram. Of course, you can store any number of separate sounds as long as you note the start and length addresses. For example, in a game you might want to have the computer say "Game Over" and "Well Done" at appropriate points. This speech could be pre-sampled from tape and saved as a binary file - loaded in with the game. Then, using appropriate addresses with the **REPLAY** command within the game will allow the phrases to be spoken at the correct time.

Sound is sampled from the cassette read data port used to load programs, and is reproduced via the AY-3-8912 sound chip, using channel B.

As the program is so time critical it must run with interrupts disabled whilst sampling and reproducing the sound. Therefore the sound chip is accessed directly rather than by using the OS routine MC-SOUND-REGISTER.

Experience has shown that anything recorded at a level of less than 0 db will be ignored by the cassette hardware, therefore speech to be sampled should be recorded at a higher level than normal (the higher the better). Although the program can sample any sound from the cassette deck, I have found that only clear speech with little background noise can be satisfactorily reproduced.

There are countless uses of speech synthesis within all types of programs, limited only by your imagination, and your Ram!

```

10 'Digital Speech Basic Loader
20 MEMORY 41999
30 FOR i=42000 TO 42328
40 READ a$:v=VAL("&"a$)
50 cs=cs+v:POKE i,v
60 NEXT i
70 IF cs<>41144 THEN PRINT"DATA ERROR - Check listing";CHR$(7):STOP
80 CALL 42000
90 CLS:PRINT"New commands loaded - you can now NEW this loader Program."
100 END
110 DATA C3,3A,A5,F3,E5,DD,E1,06,08,AF,CD,35,A4,CD,2F,A4,17,10,F7,DD,77,00
120 DATA DD,23,1B,7A,B3,20,EA,FB,C9,26,11,25,20,FD,C9,C5,06,F5,ED,60,CB,14
130 DATA C1,C9,F5,3E,C0,06,F6,ED,79,06,F4,F1,ED,79,06,F6,3E,80,ED,79,06,F4
140 DATA ED,49,06,F6,AF,ED,79,C9,CD,A7,BC,F3,3E,03,0E,00,CD,3E,A4,3E,07,0E
150 DATA 3D,CD,3E,A4,3E,02,0E,00,CD,3E,A4,C9,E5,D5,CD,5A,A4,D1,E1,06,08,CB
160 DATA 06,C5,DC,9B,A4,D4,A5,A4,E5,26,01,CD,31,A4,E1,C1,10,ED,23,1B,7A,B3
170 DATA 20,E5,CD,A7,BC,FB,C9,F5,3E,09,0E,09,CD,3E,A4,F1,C9,F5,3E,09,0E,00
180 DATA CD,3E,A4,F1,C9,FE,03,20,0E,DD,7E,00,E6,0F,32,9F,A4,DD,23,DD,23,1B
190 DATA 08,FE,02,C0,3E,09,32,9F,A4,DD,5E,00,DD,56,01,DD,6E,02,DD,66,03,CD
200 DATA 74,A4,C9,DD,5E,00,DD,56,01,DD,6E,02,DD,66,03,FE,02,C0,06,F6,3E,10
210 DATA ED,79,E5,21,1A,A5,7E,B7,28,06,CD,5A,BB,23,18,F6,CD,18,BB,FE,0D,20
220 DATA F9,3E,E0,CD,5A,BB,E1,CD,13,A4,3E,08,CD,5A,BB,3E,E1,CD,5A,BB,CD,71
230 DATA BC,C9,50,72,65,73,73,20,45,4E,54,45,52,20,74,6F,20,73,74,61,72,74
240 DATA 20,72,65,63,6F,72,64,69,6E,67,3A,00,01,44,A5,21,59,A5,CD,D1,BC,C9
250 DATA 4C,A5,C3,AF,A4,C3,D9,A4,52,45,50,4C,41,D9,52,45,43,4F,52,C4,00

```


Choose Your Next Micro

BUILD YOUR NEXT MICRO

— and win an Amstrad 6128!

Here's your chance to piece together your next micro and win an Amstrad 6128, complete with disc drive and monochrome monitor.

What to do:

- 1) First decide how much you are prepared to pay.
- 2) Then, starting with the processor box (where it says 'Start Here'), follow the arrows, ticking the boxes next to the features you want - making sure you don't go over your price limit.
- 3) Now fill in the coupon at the bottom right corner of the opposite page and send it off - before December 6 - to: *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP.
- 4) The most inventive answer to the tie-break phrase wins the Amstrad.

The results from all your questionnaires will be crunched by our computer to produce a picture of the computer you really want.

This is your chance to tell the micro manufacturers what micro to make - don't miss it.

DISPLAY

Existing TV (low-res 40 columns)
Monochrome monitor (hi-res 80 columns)
Colour monitor (hi-res 80 columns)

KEYBOARD

Calculator-type
Rubber keys
Professional quality

COMMUNICATIONS

RS232 (simple networking)
RS232 with modem

GRAPHICS

Low-res 40 columns £5 ☐
Hi-res 80 columns £10 ☐
Hi-res 80 columns with custom graphic chip (blitter) £75 ☐

RAM

64K £50 ☐ 256K £150 ☐
128K £75 ☐ 512K £200 ☐

PROCESSOR

280 8 bit (e.g. Spectrum, Amstrad) £20 ☐
6502 8 bit (e.g. BBC, Commodore 64) £40 ☐
8086 16 bit (e.g. IBM) £100 ☐
68000 16 bit (e.g. Atari ST, Macintosh) £100 ☐

PRINTER

PRICE

Dot matrix (entry level)	£100	<input type="checkbox"/>
Printer plotter	£150	<input type="checkbox"/>
Dot matrix (nr letter qual)	£250	<input type="checkbox"/>
Daisywheel (basic slow)	£300	<input type="checkbox"/>
Daisywheel (professional)	£400	<input type="checkbox"/>

START HERE

Which, if any, of these do you use now?

Amstrad ☐
BBC ☐
Commodore (64 etc) ☐
QL ☐
Spectrum ☐
Other, please specify ☐

What is the most you would pay for a computer which has all the features you have ticked?

Less than £250 ☐
Between £250 and £499 ☐
Between £500 and £749 ☐
Between £750 and £999 ☐
£1000 or more ☐

Which if any of these do you want to use your computer for?

Music ☐
Games ☐
Graphics ☐
Programming ☐
Other, please specify ☐

Choose Your Next Micro

© John Mawhood 1985

columns only) nil ☐
 -res 80 columns) £100 ☐
 0 columns) £150 ☐

PRICE

£2 ☐
 £4 ☐
 £15 ☐

RS232 with auto-answer £175 ☐
 £15 ☐ modem
 £125 ☐ Prestel emulation £20 ☐

OTHER PERIPHERALS

Joystick £15 ☐
 Music keyboard £75 ☐
 Music keyboard with synthesiser £250 ☐
 Mouse £30 ☐
 Lightpen £30 ☐
 Graphics tablet £70 ☐
 Video controller £100 ☐
 House control system £100 ☐

DATA STORAGE

Built in cassette drive £20 ☐
 Stringy floppy drive £35 ☐
 Disc-drive £100 ☐
 Twin disc-drive £175 ☐
 CDRom drive £200 ☐

SOUND

Beep £2 ☐
 3 channel stereo £8 ☐
 8 channel stereo with MIDI computer output £75 ☐

☐ ON

☐ READ

OPERATING SYSTEM

Manufacturer's own £20 ☐
 CP/M (requires Z80 processor) £50 ☐
 GEM-like icon environment £200 ☐
 (requires 16-bit processor and mouse)
 Apple II compatible (requires 6502 processor) £200 ☐
 PC DOS (requires 8086 or 8088 processor) £350 ☐
 PC DOS emulator on 68000 processor £450 ☐

OTHER FEATURES

Full multi-tasking (requires 16 bit processor) £40 ☐

LANGUAGE

None nil ☐
 BASIC £10 ☐
 Any other (s) £10 each ☐
 Please specify which

any of the following would you want
 our computer for?

☐ Small business operations ☐
☐ Household management ☐
☐ Keeping records ☐
☐ Wordprocessing ☐
 Please specify

Don't Forget:

Send your completed entry form to Micro for the Future, 12/13 Little Newport Street, London WC2H 7PP

Name
 Address

Age

My phrase is (not more than ten words):
 The most important feature of my new micro is.....

CUT PRICE SOFTWARE

Spectrum	RRP	OUR PRICE	Commodore	RRP	OUR PRICE	Amstrad	RRP	OUR PRICE
Gyroscope	7.95	5.90	Elite	14.95	10.00	Southern Belle	7.95	6.25
Shadow of the Unicorn	14.95	13.50	Int. Karate	8.50	6.00	W/Series Baseball	8.95	6.60
Monty on the Run	7.95	6.50	Quake Minus 1	9.95	7.50	Raid over Moscow	9.95	7.25
Elite	14.95	11.00	Mercenary	9.95	7.25	Matchday	9.95	7.25
I of the Mask	9.95	7.25	Neverending Story	9.95	7.25	Transact	29.95	5.99
In Karate	6.50	5.00	Imhotep (Ultimate)	9.95	7.25	Starion	9.95	7.25
Daley's Super-Test	8.95	6.00	Daley's Super-Test	7.90	6.00	Invostat	29.95	5.99
Critical Mass	8.95	6.00	Fighting Warrior	9.95	7.25	Frank Bruno's Boxing	8.95	6.95
Exploding Fist	8.95	6.95	H. Smiths Showjumping	9.95	7.25	Cyrus II Chess (disk)	13.95	10.95
Starquake	7.95	5.50	Battle of Britain	9.95	7.25	Sorcery II (Disk only)	14.95	10.95
Marsport	9.95	7.25	Monty on the Run	9.95	7.00	Marsport	9.95	7.25
Fighting Warrior	7.95	6.25	Winter Games	9.95	7.25	Hacker	9.99	7.40
Anticore	7.95	5.90	Beach Head II	9.95	7.25	Neverending Story	9.95	7.25
Impossible Mission	7.95	6.25	Sabre Wulf	9.95	7.25	Battle of Britain	9.95	7.25
Neverending Story	9.95	7.25	Summer Games II	9.95	7.25	Hypersports	9.95	6.50
World Series Basketball	6.95	5.25	Starion	9.95	7.25	Syria II Chess	9.95	7.25
Rambo	7.95	6.25	Hacker	9.99	7.50	Sold a Million	9.95	7.00
Sold a Million	9.95	7.00	Spy Vs Spy II	9.95	7.25	Glen Hoddle's Soccer	9.95	7.00
Robin of the Hood	9.95	7.00	Sold a Million	9.95	7.00	Spy Vs Spy	9.95	7.00
Tau Ceti	7.95	6.00	Robin of the Hood	9.95	7.00	Cauldron	7.99	6.00
Yie Ar Kung Fu	7.95	5.40	Yie Ar Kung Fu	8.95	6.00	Fighting Warrior	9.95	6.50
Xel	9.95	7.00	Skooldaze	6.95	4.75	AMSTRAD DISK SOFTWARE NOW		
Back to School	6.95	4.75	L. C. Computer People (D)	14.95	11.95	AVAILABLE. Please ring for details		
Special offer - Spectrum order £20			Commodore order £20 or more			Special Offer - Amstrad order £20		
or more ICLE WORKS or BRAXX			BOULDERDASH FREE with order.			or more FLIGHT PATH 737 FREE		

P&P included. Overseas orders add 75p per tape. For Mail Order please send Cheque/PO payable to CFS Visual Access Card orders by phone welcome, too.

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

PD628

MICROVOX

is a professional sound sampler
(Feargal Sharkey uses one!)

However it doesn't cost £20,000 or
even £2,000 but a mere £229.95

You'll need a Commodore 64 or 128
with a disk drive. A MIDI-compatible
keyboard is useful, but not essential.

The extensive MICROVOX software
allows you to edit waveforms and save
sounds to disk. It has a 2000 note
sequencer, a digital delay line and
much more!

SUPERSOFT

Winchester House, Canning Road,
Wealdstone, Harrow, HA3 7SJ

Tel: 01-861 1166 for further details and
our free catalogue

PD106A

SOFT INSIGHT

DISCOUNT SOFTWARE

SPECTRUM	RRP	OUR PRICE	WORLD SERIES BASEBALL	RRP	OUR PRICE	COMMODORE	RRP	OUR PRICE
ANY LEVEL 9 GAMES	9.99	7.45	SCRABBLE	9.95	7.45	ANY OF US GOLD	9.95	7.45
GYROSCOPE	7.95	5.95	ANY AMSOFT GAMES	9.95	7.50	ANY ACTIVISION	9.95	7.45
I OF THE MASK	9.95	7.45	ANY LEVEL 9 GAMES	9.95	7.45	ANY LEVEL 9	9.95	7.45
MARSPORE	9.95	7.45	ALIEN 8	9.95	7.45	MERCENARY	9.95	7.45
TAU CETI	9.95	7.45	3D GRAND PRIX	9.95	7.45	NEVER ENDING STORY	9.95	7.45
NEVER ENDING STORY	9.95	7.45	KNIGHTLORE	9.95	7.45	SKYFOX	9.95	7.45
MONTY ON THE RUN	9.95	5.95	MARSPORE	9.95	7.45	WIZARDRY	9.95	7.45
G. GOODIES CRICKET	9.95	7.45	COMPILER	34.95	28.95	WINTER GAMES	9.95	7.45
SABOTEUR	8.95	6.77	RED MOON	6.95	5.20	SUMMER GAMES II	9.95	7.45
FAIRLIGHT	9.95	7.45	MASTERFILE	24.95	18.95	FIGHTING WARRIOR	9.95	7.45
WHAM MUSIC BOX	9.95	7.45	NEVER ENDING STORY	9.95	7.45	KARATEKA	9.95	7.45
EXPLODING FIST	8.95	6.71	RAID	9.95	7.45	BATTLE OF BRITAIN	9.95	7.45
THE ARTIST	12.95	10.00	MATCHDAY	9.95	7.45	UNDERWORLD	9.95	7.45
ELITE	14.95	11.21	FORMULA 1	8.95	6.71	ZAXXON II	9.95	7.45
BORER OF THE RINGS	6.95	5.20	HIGHWAY ENCOUNTER	8.95	7.00	TERRORMOLINOS	9.95	7.40
CRITICAL MASS	8.95	6.71	THEY SOLD A MILLION	9.95	7.45	THEY SOLD A MILLION	9.95	7.45
STARQUAKE	7.95	5.96	SPY VS SPY	9.95	7.45	ADRIAN MOLE	9.95	7.45
IMPOSSIBLE MISSION	7.95	5.96	ADRIAN MOLE	9.95	7.45	DYNAMITE DAN	9.95	7.45
WORLD SERIES BASKETBALL	7.95	5.96	DYNAMITE DAN	8.95	6.71	ARCADE HALL OF FAME	9.95	7.45
WINTERSPORTS	9.95	7.45	TERRORMOLINOS	9.95	6.71	RACING DESTRUCTION SET	9.95	7.45
THEY SOLD A MILLION	9.95	7.45	FIGHTING WARRIOR	8.95	6.71	ATARI		
BACK TO SCHOOL	8.95	5.20	CAULDRON	8.99	6.75	MERCENARY	9.95	7.45
INTERNATIONAL KARATE	6.50	5.00	BOUNTY BOB STRIKES BACK	9.95	7.45	THEATRE EUROPE	9.95	7.45
ARCADE HALL OF FAME	9.95	7.45	KNIGHTLORE	9.95	7.45	BALL BLAZER	9.95	7.45
ROBIN OF THE WOOD	9.95	7.45	MONOPOLY	9.95	7.45	UP 'N DOWN	9.95	7.45
ROBIN OF SHERLOCK	6.95	5.20	PHANTOM	9.95	7.45	FRACTALUS	9.95	7.45
BEACHHEAD II	7.95	5.96	RED MOON	6.95	5.20	SUPER ZAXXON	9.95	7.45
BOUNTY BOB STRIKES BACK	7.95	5.96	MATCHDAY	9.95	7.45			
AMSTRAD			ALIEN 8	9.95	7.45			
			STRIKE FORCE HARRIER	9.95	7.45			
			REPTON II	9.95	7.45			

PD631

C & F ASSOCIATES

BBC	RRP	OUR PRICE	SPECTRUM	RRP	OUR PRICE
ENTHART 7 (80 TRACK)	16.95	14.95	MARSPORE	9.95	6.90
BLUE RIBBON GAMES			FAIRLIGHT	9.95	7.25
DISK 1 (40 TRACK)	9.95	7.50	RED ARROWS	8.95	5.75
DISK 2 (40 TRACK)	9.95	7.50	THE ARTIST	12.95	9.95
COMBAT LYNX	8.95	6.75	STARQUAKE	7.95	5.95
BOFFIN	9.95	6.90	HARRIER ATTACK	5.95	4.50
CASTLE QUEST	12.95	8.95	THAT'S THE SPIRIT	7.95	5.20
FELIX & THE FRUIT MONSTERS	7.50	2.50	RED MOON	6.95	5.50
RED MOON	6.95	5.50	ATAC ATAC	5.50	4.50
SWOOP	7.95	1.95	NIGHTSHADE	9.95	6.90
FELIX & THE EVIL WEEVILS	6.95	2.50	UNDERWORLD	9.95	7.25
ATAC ATAC	7.95	5.95	THE PYRAMID	5.50	2.50
TEMPEST	9.95	7.25	KNIGHT LORE	9.95	7.25
KILLER GORILLA	7.95	2.50	SAM STOAT SAFE BREAKER	6.95	5.50
ALIEN-8	9.95	7.25	AQUAPLANE	6.95	1.95
RUBBLE TROUBLE	7.95	2.50			
REPTON	9.95	7.25	AMSTRAD		
BUMBLE BEE	7.95	2.50	RED ARROWS (DISK)	12.95	7.50
KNIGHT LORE	9.95	7.25	RED ARROWS	8.95	5.75
SABRE WOLF	9.95	7.25	KNIGHT LORE	9.95	7.25
FOOTBALL MANAGER	7.95	5.95	WIZARDS LAIR	8.95	6.25
GHOULS	7.95	2.50	PROJECT FUTURE	8.95	6.75
			COMBAT LYNX	8.95	5.95
			ROCCO	8.95	6.75
ELECTRON			ALIEN 8	9.95	7.25
NIGHTMARE MAZE	2.50	2.25	RED MOON	6.95	5.50
BOFFIN	9.95	6.90	DUN DARACH	9.95	7.25
COMBAT LYNX	8.95	6.75	BRIAN BLOODAXE	8.95	5.95
CASTLE ASSAULT	2.50	2.25	TASWORD 464 (CASS)	19.95	16.95
			TASWORD 464/664 (D)	24.95	19.95
			TASWORD 6128 (D)	24.95	19.95
SPECTRUM					
WIZARDS LAIR	6.99	5.50	COMMODORE 64		
ALIEN-8	9.95	7.25	IMHOTEP	9.95	6.25
ABU SIMBEL	7.95	5.95	RED ARROWS	8.95	5.75
NODES OF YESOD	9.95	6.25	BLACKWYCHE	9.95	6.25
A VIEW TO A KILL	10.99	7.50	WIZARDS LAIR	8.95	6.25
DUN DARACH	9.95	7.25	WANTED: MONTY MOLE	7.95	5.95
HERBERT'S DUMMY RUN	9.95	7.25	HARRIER ATTACK	5.95	4.50
ROCCO	7.95	5.95	ENTOMBED	9.95	6.25
GYRON	9.95	7.25	THING ON A SPRING	7.95	5.95
EVERY ONE'S A WALLY	9.95	7.25	COMBAT LYNX	8.95	6.75
COMBAT LYNX	8.95	6.75	SHADOWFIRE	9.95	7.25
MONTY ON THE RUN	7.95	5.95	WIZARDRY	9.95	7.25
SHADOWFIRE	9.95	7.25	RED MOON	6.95	5.50
BEACHHEAD	7.95	5.95	NODES OF YESOD	9.95	6.25
AIRWOLF	6.95	5.50			
JUMBLY	6.95	2.50	COMMODORE C16		
MONTY IS INNOCENT	6.95	5.50	DORK'S DILEMMA	6.95	5.95
WANTED: MONTY MOLE	6.95	5.50	SWORD OF DESTINY	6.95	5.95
BEAKY & THE EGG SNATCHERS	6.50	2.50			

PLEASE NOTE: BBC DISC SOFTWARE GUARANTEED FOR ACORN DFS ONLY

ALL PRICES INCLUDE VAT AND POSTAGE & PACKING
(Overseas Orders add £1.00 per item)

CHEQUES/PO PAYABLE TO: C & F ASSOCIATES
AND SEND TO

C & F ASSOCIATES (PCW), PO BOX 2, BIDEFORD EX39 3RE PD624A

POPULAR Computing WEEKLY

BINDER £3.50 + p&p

Keep your issues in order with a specially designed
Popular Computing Weekly binder holding up to 13
copies for quick reference back to that program
listing or article.

Send me..... *Popular Computing Weekly* binders
at **£3.50 each** plus postage (**£1 U.K., £1.50 Europe,**
£2.50 Rest of World)

☐ I enclose a cheque/postal order for.....
made payable to Sunshine Publications Ltd.

☐ Please charge my Access/Visa Card No:

Name _____

Address _____

Postcode _____ Country _____

Which computer do you use? _____

Return this coupon together with payment to:

PCW BINDER
12-13 Little Newport Street
London WC2H 7PP, UK

HA10

Play it again, Sam

Now you've composed the music - how to use it in your own programs - on BBC B by Cy Noble

This is the last in a series of three programs for creating music on the BBC B. This one uses the tune data created by the first Program, Creator. It interrupts whatever the computer is doing 50 times a second, using the frame sync event, and tops up the sound channel buffers with the sound data currently required then calls and Osword operating system routine to play the sound. If the buffer is full it exists without doing anything.

Being machine code it is so fast you notice nothing and the computer appears to be doing two things at once. You could be writing a program, printing a listing, have graphic animation going and the music keeps playing. This

is how it is done in all your favourite games - by machine code routines like this one.

After you've typed in the programs (and saved them) and debugged them you'll have a means of writing music easily and quickly for performance on the Beeb. If you don't feel up to doing all that work (a monumental task) then send £10 to me for a cassette containing the entire suite of programs. If you send £11.50 you get a five inch disc with all the programs plus two demo tunes, plus all three articles in this series in *Wordwise* format. A three inch disc costs £15 because they are more expensive for me to buy.

The listing is copiously Remmed and

the workings are explained there, so here I'll tell you how to use it.

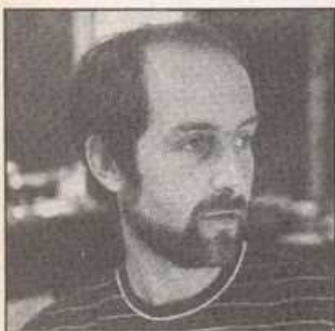
This program assembles machine code at &900 as written. It takes up just over one page of memory (a Page = &100 - ie, 256 - bytes) and will keep playing the music over and expand over until *Break* or until you command it to play another tune. Bear in mind that as the routine is more than one page it will overlap part of the next page. Now page &800 is where the function key definitions live and page &C00 is used if characters are redefined with *VDU 23*. For example, if you define more than four envelopes then envelopes five onwards take &10 (ie 16 decimal) bytes each starting at &900 so the best location to assemble is at &940 if you've got eight envelopes. I've deliberately put the 'set-up' subroutine at the end because once it has been called it is of no further use and can be overwritten if required. As long as the address for 'switch' does not go above &AFF even a hard break will not disturb the essential parts. Next week, more listing and the final instructions.

```

10REM Title 'ITMUSIC'
20REM By Cy Noble
30REM 323 North Circular Rd.
40REM London N13 5JH
50:
60REM Caution: If you define more
70REM than 4 envelopes then &900
80REM should be changed to
90REM some other suitable address
100REM (see text)
110:
120interrupt=&900:REM Alter to suit
130osbyte=&FFF4
140osword=&FFF1
150tune1adr=&1100:REM Change these
160tune2adr=&1400:REM addresses to
170tune3adr=&1500:REM suit (see text)
180bufadr=&8C:tuneadr=&8E:REM +&8F
190:
200PROCassemble
210CALL setup
220CLS
230:
240IF FNchecksum<>32658 PRINT"Checksum erro
r"CHR#7:PRINT"Check your assembly code":END
250CLS:PRINT"Save assembled machine code ?"
260PROCquery
270IF CX<3 THEN 400
280INPUT"Name for machine code file "mcfile
$
290PROCquery
300IF CX<3 THEN 280
310SA$="BA,"+mcfile$+" "+STR$interrupt+" "+
STR$(endcode+1)+" "+STR$setup
320PROCcassette("RECORD")
330PROCquery
340IF CX<3 THEN 250
350OSCLI SA$
360MOTOR 0
370:
380REM checksum should be 32658
390:
400CLS:PRINT"Note these for reference""
410PRINT"Load address for tune 1=";"tune1a
dr
420PRINT"Load address for tune 2=";"tune2a
dr
430PRINT"Load address for tune 3=";"tune3a
dr
440PRINT:PRINT"changetune routine at &";^ch
angetune
450PRINT"switch=";"switch
460PRINT"setup=";"setup
470PRINT"checksum=";FNchecksum
480PRINT""Load a tune Boss ?"
490PROCquery
500IF CX<3 END
510:
520INPUT"Name of tune data file "tune$
530INPUT"Name of envelope data file "env$
540PROCcassette("PLAY")
550PROCquery
560IF CX<3 THEN 480
570tune$="LOAD "+tune$+" "+STR$tune1adr
580OSCLI tune$
590env$="LOAD "+env$+" BC0"
600OSCLI env$
610MOTOR 0
620switch=1:REM or 2,3 etc (see text)
630CALL changetune
640END
650:
660DEFPROCassemble
670FOR PASS=0TO1
680PZ=interrupt
690OPT PASS*3 \ change to PASS*2
700:
710.event \ Check if it is the
720CMP #4 \ event we want i.e
730BEQ event1 \ vertical sync - and
740JMP out \ get out if not
750:
760.event1 \ It is our event so
770PHA \ save all the
780TXA \ registers
790PHA
800TYA
810PHA
820:
830.checkbuffer \ calculate the sound
840LDY #0 \ channel buffer and
850LDA #251
860SEC
870SBC buffer,Y
880TAX
890LDY #255
900LDA #128
910JSR osbyte
920CPX #0 \ if x is zero it is
930BNE event2 \ full up and we
940:
950.exit \ restore the
960PLA \ registers and
970TAY
980PLA
990TAX \ get out
1000PLA
1010.out
1020JMP (&230)
1030: \ Otherwise -
1040.event2 \ we check to see if
1050LDA notecount \ all the notes have
1060CMP howmany \ been played.
1070BNE doosword \ Go play the next
1080LDA tempadr \ one if not or
1090STA tuneadr \ set the pointers
1100LDA tempadr+1 \ back to the
1110STA tuneadr+1 \ start of the
1120LDY #0 \ data table for
1130STY notecount \ this tune -but the
1140LDA (tuneadr),Y \ first byte is
1150STA howmany \ how many notes
1160INC tuneadr \ & this is the 1st
1170JSR expand \ expand & put note
1180JMP checkbuffer \ in buffer & check

```


Tony Bridge's Adventure Corner



Final Quill

In this, the last of our current look at *Quill'd* adventures (though we shall of course see more in the future, let's discuss more programs from readers. Kevin Maddox of Rainford has sent me his adventure which he calls *Elfindor*. Presentation is quite good, featuring an old-English typeface that is legible enough for the player to be able to discern two spelling mistakes and a punctuation mistake on the first screen. Now, every one is fallible, of course, but at least the opening screen should be presentable! However, though pre-*Patch* and pre-*Illustrator*, the game is quite playable, with a lot of combat.

Ambushed

The scenario is of the genus Fantasy/Slab-and-Slash, concerning your quest for the Golden Bow and Arrow of Gondor, stolen by an Orc from the body of ambushed Dwarf, Krane. Kevin goes out of his way to ensure that I realise just how complex the whole thing is (though complexity doesn't necessarily mean a good adventure), and I can believe him. He neglected, however, to tell me how to fight back when attacked, so I wasn't able to progress very far. But the game is very colourful and there seems to be a great number of locations, with lots of objects.

Kevin tells me (though I haven't tested the information) that these objects have uses which are not always so apparent, so a lot of to-ing and fro-ing is required in order to find out what they all do. I like this sort of puzzling,

and the author tells me that even he takes 500 moves to complete the adventure, so a good long game is guaranteed for all! And it is just £3.50 from: Sigma Soft 8, Pine Dale, Reinfeld, Merseyside WA11 8DP.

One of the places in which *The Quill* would come in very useful is the classroom: there have been one or two "educational" uses of the utility, a notable example being the *Jack in Magicland* series from Turtle Software, which uses an elegant alternative to the two-word input and its attendant frustrations and delays, a

ghosts and Bob's yer Uncle. The adventure is a good one, fairly dripping with atmosphere - the mists draw in across the darkening fields as you wander around the village, and of course you come across all the famous real-life (?) ghosts of the neighbourhood.

The game is worth-while, and although I would like to know more about the involvement of the computer club in the writing of the adventure, the collaboration has seen good results. If you'd like to know more about the experiences and problems they

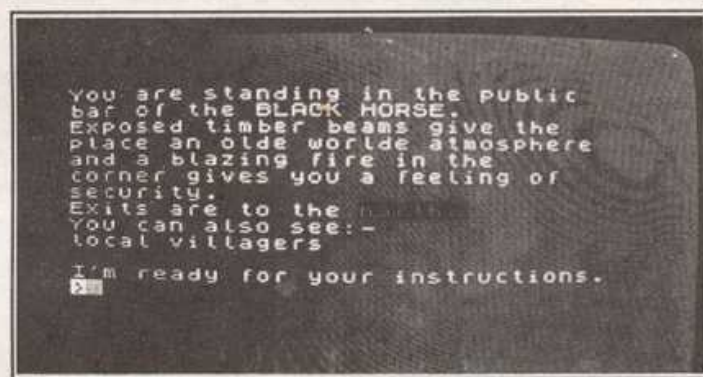
mate knowledge of the characters and locations - for example, the shape of Mark's nose (not entirely unadjacent to that of Concorde!) is not a fact known to millions, but it is a rather important clue in the solving of the adventure.

For this reason, the storyline may not appeal to a wide audience, but to those in the know it should be worth having a look: Roy Stead, 34 Cherry Sutton, Hough Green, Widnes, Cheshire WA8 9TN.

Geographical *Quill'd* adventures, as I've said, have made a few appearances, and I looked at one some time ago from Nightingale Software, *Operation SOS*: the geographical aspect of this adventure is not the be and end-all of the game, but nevertheless is far enough out of kilter to be annoying.

Fridaysoft feels strongly enough about this subject to have released their own attempt at a stroll around London's landmarks in the guise of a quest for the secret combination to a safe deposit box - *London Adventure* on the Spectrum.

One hundred locations are skilfully linked together to give a good feeling of walking around a real London. The problems are fairly logical, though the limitations of *The Quill* make for some ugly command requirements. I would recommend you look at this realistic, occasionally amusing and reasonably priced (£4.95 on cassette and £6.75 on microdrive) wander through the streets of London: Fridaysoft, Unit F, The Maltings, Station Road,



Ghosthunters from Duncan Bowen

multiple-choice format.

Some while ago, I mentioned the Duncan Bowen School of Ashford in Kent - the computer club there got together and did just that, creating their own *Quill'd* adventure, featuring, naturally enough, scenes and characters from their own locality.

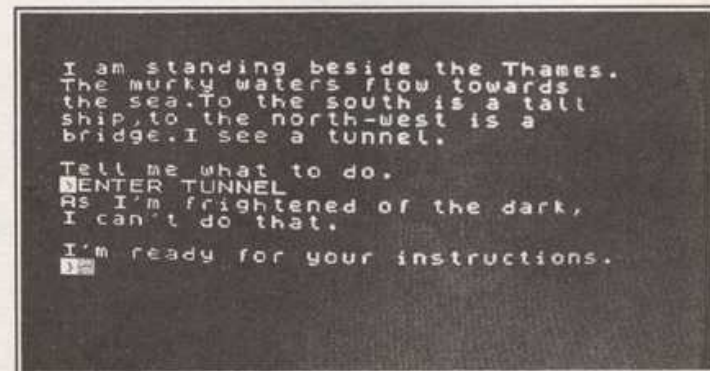
Ghosts

Another way of using *The Quill* is in giving the player a tour of a real landscape, which seems to be a good way of introducing some local history: this has been done before, too, but Duncan Bowen's *Ghosthunters* new game seems to have taken things a step further, in getting a group to work on an adventure featuring local colour.

Near Ashford is a village called Pluckley, reputed to be the most haunted in England. Your task is to escape the village, using knowledge you have gained from a mysterious book in the local library. Find the six missing pages and the attendant

had, or indeed just fancy having a closer look at the adventure, contact Mr J Fleming at Duncan Bowen Youth Wing, Kingsnorth Road, Ashford, Kent TN23 2LY.

Kentaylor is another program dealing with a school, though this time written by just one of the pupils, Roy Stead. Concerning, as it does, a particular school and the adventure would seem to appeal mainly to those who happen to frequent the school or



London Adventure from Fridaysoft

the parents and friends thereof. Most of the problems have solutions which can only be found by someone with inti-

Sawbridgeworth, Herts CM21 9JX.

Tony Bridge

SPECIAL OFFER!!

HIGH QUALITY COMPUTER PROGRAM DATA RECORDER

A once only opportunity to own a high quality mains operated data store at just over 1/2 price!

Originally manufactured for a world famous computer retailer, a supply surplus allows us to offer this unit, which normally sells for around £35, at this incredible price. Ideal for use with Spectrum, BBC, Amstrad (extra connectors required) and most other leading makes.

Note: It is not suitable for the Commodore 64.

Mail to: 19/21 HIGH ST, ACTON W3 6NG.

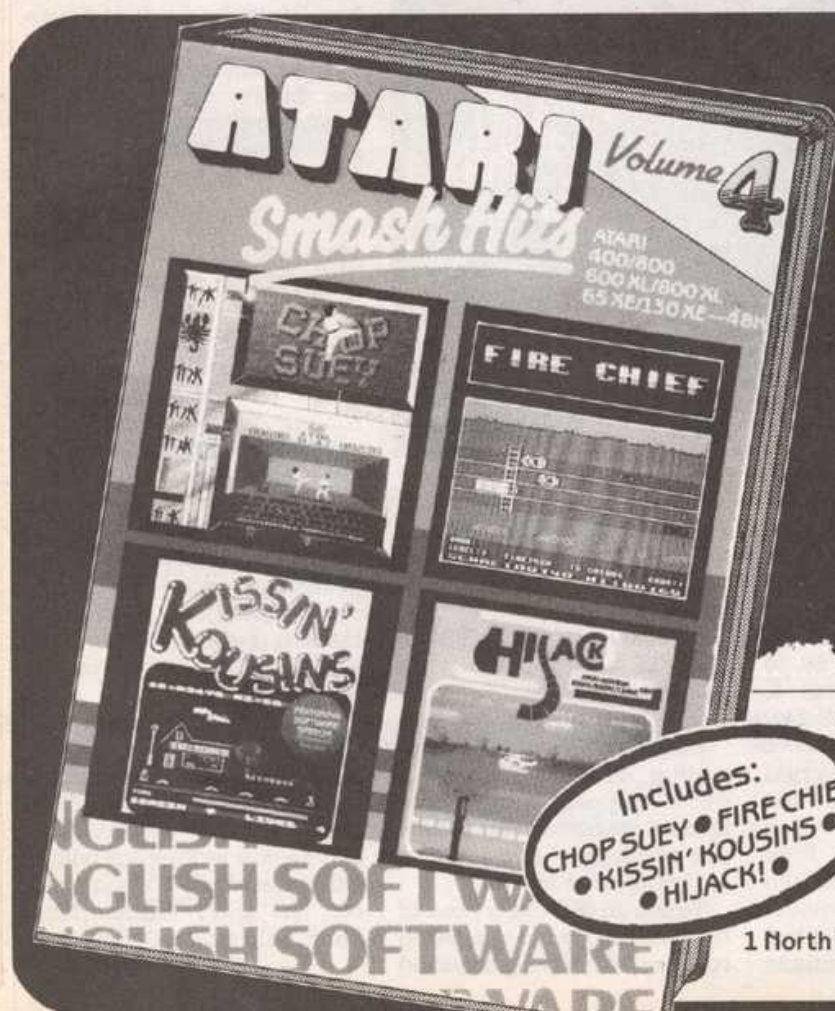
RTVC



ONLY
£18.95
Plus £2.75 P+p.

Callers (Mon/Sat 9 - 5.30) to:
323 EDGWARE ROAD, LONDON W2,
and at 21 HIGH ST, ACTON W3 6NG.
Goods despatched to U.K. postal addresses
only. Please allow 14 days for delivery.

All cheques/P.O.'s
payable to RTVC
Ltd. Mail or 'phone
orders by ACCESS,
Telephone: 01-992 8430.



At Last!
**Atari
Smash Hits
volume 4**

ATARI 400/800/XL/XE-48K Cassette £9.95

48K Disk £12.95

Includes:
CHOP SUEY • FIRE CHIEF
• KISSIN' KOUSINS •
• HIJACK!

Available from all good Atari retailers
or POST FREE from:

ENGLISH SOFTWARE™

1 North Parade, Parsonage Gardens, Manchester M60 1BX
Tel: 061-835 1358



Entombed

The bad news this week is that there was a bug in the *Entombed* routine printed a couple of weeks ago. However, Kenneth Devlin writes to tell me that he has a better routine available now, one that doesn't use the screen Ram to store the code. The disadvantage of the first routine was that if you accidentally caused the screen to scroll everything was ruined.

So instead of attempting to correct the first routine here is Kenneth's effort instead, complete with checksums to catch errors. Where Kenneth uses the '/' character, you should press the Enter key.

To get into the game we are going to create a new loader for it. Get a blank cassette and type in the following program:

```
10 T=0 : For A=20000 TO 20023 : Read B : Poke A,B : T=T+B : Next 20 If T<>2882 Then Print "ERROR IN DATA" : END 30 Data 169, 43, 141, 40, 3, 169, 78, 141, 41, 3, 96, 169, 192, 141, 62, 3, 169, 255, 141, 64, 3, 76 40 Data 237,246
```

Lives

Run this and if the error message appears check the listing. Type SYS 20000 / and press Shift/Runstop and play the *Entombed* tape. Once loaded type *Poke* 20012,2 / *Poke* 20017,16 / *Poke* 49431,170 / *Poke* 49342,11 / *Poke* 43,167 / *Poke* 45,174 / *Poke* 46,194 /. Put the blank tape into the cassette and press record. Type SYS 20000/Save "ENTOMBED", 1,1/.

Once this has been done switch the computer off and on again. The new loader only needs to be created once. Now to get infinite lives,

type in the following program.

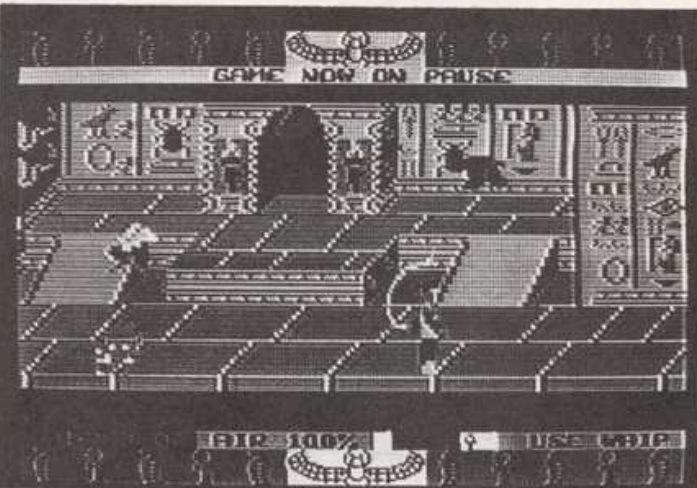
```
10 For A=2976 TO 3003 : Read B : Poke A : T=T+B : Next 20 If T<>3279 Then Print "ERROR IN DATA" : END 30 Data 169, 96, 141, 192, 108, 169, 8, 162, 8, 96 40 Data 162, 4, 189, 183, 11, 157, 158, 8, 202, 208, 247, 76, 80, 8, 32, 160, 11, 234
```

Run it, if an error message appears again check the data. Rewind the blank tape and press Shift/Runstop to load the new loading. Once it has gone in, swap the tapes and *Entombed* will load as normal.

Blackwyche

Let's finish off the set now with Kenneth's routines for *Staff of Karnath* and *Blackwyche*. For *Staff* type in and Run the following:-

```
10 T=0 : For A=20000 TO 20037 : Read B : Poke A,B : T=T+B : Next 20 For A=2742 To 2769 : Read B : Poke A,B : T=T+B : Next : If T<>6363 Then Print "ER-
```



Entombed

```
ROR" : END 30 Data 169, 43, 141, 40, 3, 169, 78, 141, 41, 3, 96, 169, 192, 141, 62, 3, 169, 255, 141, 64, 3, 76 40 Data 237, 246, 120, 162, 15, 189, 26, 192, 157, 26, 3, 202, 208, 247, 88, 96 50 Data 169, 141, 141, 245, 8, 169, 6, 141, 246, 8, 169, 22, 141, 247, 8, 76, 5, 8
```

Type SYS 20000 / and press Shift/Runstop to load the first part of *Staff*. Once loaded type *Poke* 1005,182 / *Poke* 1006,10 / SYS 20024 and the program will load, without the normal multi-coloured border, giving you infinite

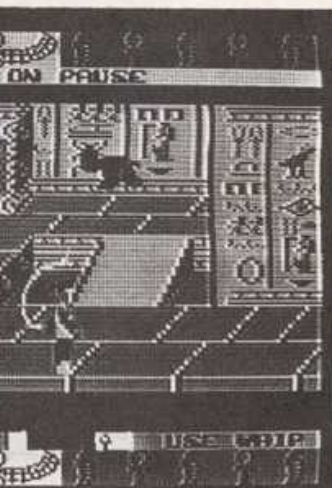
energy. Even though the percentage energy on screen will go down, once it reaches zero it will clock back up to 100%.

Blackwyche is the simplest of the lot. Just enter and run the following program and it will load the loader. Alter it and load the rest of the game.

```
10 Sys 63278 : Poke 830,100 : Poke 831,174 : Poke 832,102 : Sys 62828 20 For A=679 TO 767 : Poke A, Peek(25088+A) : Next 30 For A=828 TO 1200 : Poke A, Peek(25088+A) : Next 40 Poke 990,141 : Poke 991,74 : Poke 992,18 : Sys 1024
```

Simplest

Once again the program will load without the border effect, and the energy display will still decrease, but will clock back to 99 on reaching zero. Kenneth's most recent letter also included some pokes for the Broderbund game *Stealth* so here they are. Load the game as normal and reset the computer *Poke* 30298,lives



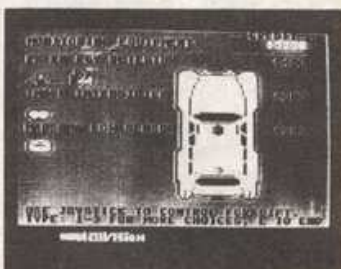
Blackwyche

Poke 30590,173 for infinite lives
Poke 28512,132 for infinite energy
Poke 28341,169 / *Poke* 28342,0 / *Poke* 28343,234 - no collisions
Sys 53055 to restart

Kenneth writes that on completing level 5 of *Stealth* a quote appears from some famous person. Every time you reach level five a different quote appears.

To see all of these try one of the ASCII code printing routines we have published

over the last couple of weeks on locations 29392 to 36864.



Ghostbusters

Backpack

Finally here are some pokes for *Ghostbusters*. Load the game and then reset it.

Poke 34777,169 infinite traps
Poke 34446,234 / *Poke* 34447,234 infinite energy
Poke 34351,153 no backpack energy loss after crossing the beams
Poke 29164,169 / *Poke* 26165,3 / *Poke* 32425,169 infinite men
Poke 38454,96 / no decrease in money

Poke 29931, × where × is the initial amount of cash. To calculate the value of × remove the last four zeros from the cash number and convert the remainder to a two digit number. Multiply the first figure of the remainder by 16 and add the other to the remainder figure, eg, for \$500000 the value of × is 5*16 + 0 = 80. For \$90000 it is 0*16 + 9 = 9.

Wonder game

I had hoped to have a special treat here for Spectrum owners in the form of a cheat routine for the Edge's new wonder game *Fairlight*. Unfortunately Chris Allen who was working on the program tells me that it has one of the most convoluted and intricate protections on the loader you can imagine. It is possible to crack it, but the routine necessary to do so is correspondingly long.

However, if anyone is really desperate to get their hands on the cheat routine, send Chris and SAE and £1 to cover his time and trouble, and he will write back with a full explanation. You can contact him at 41 Westmorland Road, Felixstowe, Suffolk.

Tony Kendle

There's a Dealer near you . . .

AVON

SOFTWARE PLUS COMPUTERS
12 YORK STREET
BATH
Tel: (0225) 61676

PL626

HUMBERSIDE

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

PL493

LIVERPOOL

BLUE CHIP
77 ALLERTON ROAD
LIVERPOOL L18 2DA
Tel: (051) 722 3037

PL517

OXFORDSHIRE

CLUB COMPUTERS
6 EVANS YARD
BICESTER
OXFORDSHIRE
Tel: (0869) 248600

PL685

BIRMINGHAM

D.G. MICROTEK ELECTRONICS
190B DUDLEY ROAD
WINSON GREEN
BIRMINGHAM
Tel: (021) 454 4697

PL644

KENT

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

PL484

LONDON

SILICASHOP
1-4 THE MEWS
HATHERLEY ROAD
SIDCUP, KENT
Tel: 01-309 1111

PL633

ESSEX

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

PL483

dgh software centre

10 NORTH STREET,
ASHFORD, KENT
Tel: (0233) 32597

PL686

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

PL488

WARWICKSHIRE

FAST FORWARD COMPUTER STORE
29 SMITH STREET
WARWICK
Tel: (0926) 492004

PL645

YORKSHIRE

THE COMPUTER STORE
18 CLEVELAND STREET
DONCASTER
Tel: (0302) 25260

PL510A

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

PL484

MICROWAY COMPUTERS
39 HIGH STREET
RAINHAM, KENT
Tel: (0634) 376702

PL612

GAMES WORLD
129 KING STREET
HAMMERSMITH
LONDON W6
Tel: 01-741 4467

PL516

GLASGOW

THE COMPUTER DEPOT
205 BUCHANAN STREET
GLASGOW G1 2JZ
Tel: (041) 332 3944

PL705

LANCASHIRE

SOUND AND VISION
11 SILK STREET
LEIGH, LANCs WN7 1AW
Tel: (0942) 673689

PL602

SOFTWARE STORE LTD
35 LONDON ROAD
LONDON SW17
Tel: 01-685 1476

PL680

THE COMPUTER STORE

26 TEALL STREET
WAKEFIELD
Tel: (0924) 384983

PL517

THE COMPUTER STORE

8 BRIDGE STREET
YORK
Tel: (0904) 646934

PL518

THE COMPUTER STORE

40 TRINITY STREET ARCADE
LEEDS
Tel: (0532) 429284
(open now)

PL519

HEREFORDSHIRE

HONEYSETT COMPUTERS
17 UNION STREET
HEREFORD HR1 2BT
Tel: (0432) 279404

PL624

LEEDS

MICROPOWER
NORTHWOOD HOUSE
NORTH STREET
LEEDS LS7 2AM
Tel: (0532) 458800

PL683

LOGIC SALES
19 THE BROADWAY
THE BOURNE, SOUTHGATE
LONDON N14
Tel: 01-882 4942

PL686

HERTFORDSHIRE

BROADWAY COMPUTER CENTRE
75 QUEENS ROAD
WATFORD, HERTS
Tel: (0923) 43301

PL636

LEICESTERSHIRE

DIMENSION COMPUTERS LTD
27-29 HIGH STREET
LEICESTER
Tel: (0533) 57479

PL640

NOTTINGHAM

MPC SOFTWARE
72 JULIAN ROAD
WEST BRIDGFORD
NOTTINGHAM NG2 5AN
Tel: (0602) 820106

PL639

YORK COMPUTER CENTRE
7 STONEGATE ARCADE
YORK
Tel: (0904) 641862

PL516

Discover the Atari ST



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

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

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

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

Please send me _____ copies of **The Atari ST Companion** @ £9.95 each.

☐ I enclose a cheque/postal order for £_____ payable to Scot Books

☐ Please debit my Visa/Access card no. _____

valid from _____ expires end: _____

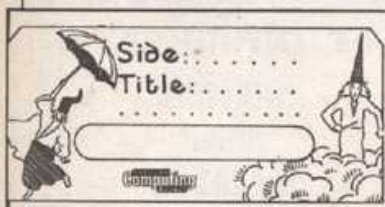
Signed: _____

Name: _____

Address: _____

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

Micro Magic



Popular cassette labels

Popular Computing Weekly

Micro Magic



The Amstrad CPC6128

We are giving away an Amstrad CPC6128 128K micro — worth £399 — every seven days until Christmas. Not only that, but every **Micro Magic** card is a winner — every card wins a runner-up prize of free **Special Popular Computing Weekly** cassette labels

How to find out if you win this week

To find out if you are a prize winner this week this is what you must do:

- 1) Key in the computer program listing printed here into your micro and **Run** the program.
- 2) Input your special **Micro Magic** number as data in the program when requested and press **Enter**.
- 3) The program will tell you if you have won a prize this week and what it is.
- 4) If you have won a prize you can claim it by filling in the coupon on the back of your special **Micro Magic** card. Then send

```

3 PRINT "Input your personal Micro
  Magic number"
10 INPUT N
15 FOR X=1 TO 3
20 LET A=X*2 + (N*27)
30 LET B=A + 27
40 LET Y=X*2 + N + 1050
45 NEXT X
50 IF Y=1176984 THEN GOTO 60
55 IF Y=1344360 THEN GOTO 70
60 PRINT "Your matching Micro Magic
  number is"Y
61 PRINT "Better luck next week!"
65 GOTO 60
66 STOP
70 PRINT "Your matching Micro Magic
  number is"Y
71 PRINT "You have won an Amstrad 6
  128!"
75 GOTO 70
76 STOP
80 PRINT "Your matching Micro Magic
  number is"Y
81 PRINT "You have won cassette lab
  els!"
84 GOTO 80
85 STOP
    
```

Micro Magic: Week 8 Program listing

the completed card off to: **Micro Magic, Popular Computing Weekly, 12-13 Little Newport Street, London WC2H 7PP.**

Don't forget to fill in both your name and address, and also both your winning **Micro Magic** answer from this week and your special **Micro Magic** number.

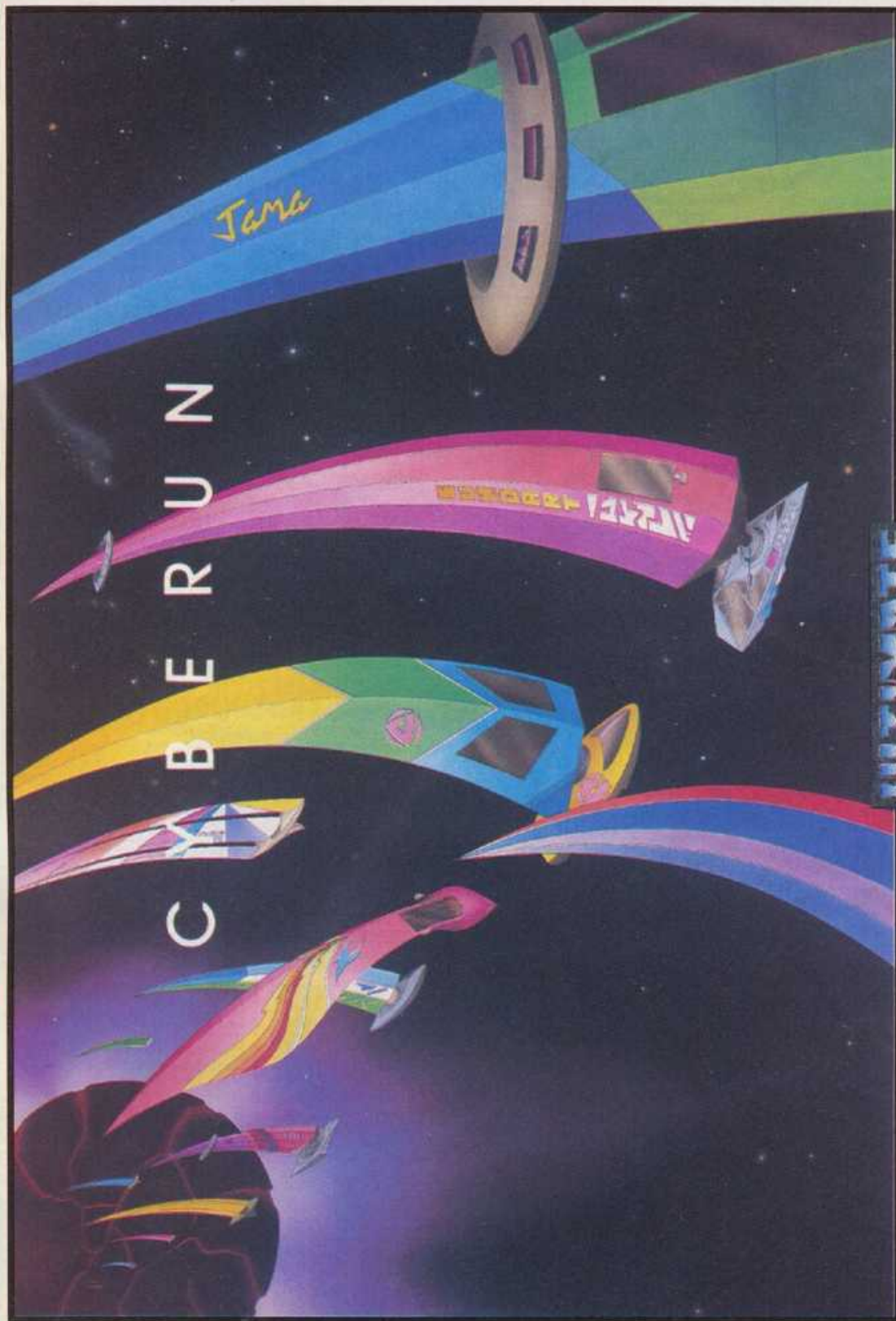
5) If you haven't won this week, don't give up hope. Keep your **Micro Magic** card and use it to find out if you win with next week's **Micro Magic** computer program. The same card will last you right through to Christmas, so don't throw it away — you could miss the opportunity to win.

This week's winning Micro Magic Numbers: 1176984 and 1344360

If you think you've won complete the form on the back of your **Micro Magic** card and send it to: **Micro Magic, Popular Computing Weekly, 12-13 Little Newport Street, London WC2H 7PP.**

Micro Magic cards can only be obtained in line with the criteria outlined by Scot Press. Participants are entitled to only one card each. Cards and accompanying documentation can be obtained free of charge by writing to Scot Press, 12-13 Little Newport Street, London WC2H 7PP.

48K SINCLAIR SPECTRUM



"CYBERUN" recommended retail price £9.95 inc VAT.

Available from W.H.SMITHS, 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



FAST COMPUTER REPAIRS

VIDEO VAULT INTERNATIONAL 10★ REPAIR SERVICE

THE NO. 1
REPAIR CENTRE
IN THE U.K.

24 HOUR
TURNAROUND



HOW TO SEND YOUR COMPUTER

Just parcel your computer in suitable wrapping enclosing £19.95 for Spectrum repairs, please do not send power supplies. Commodore computers, just send £1.75 (U.K. Eire, I.O.M. C.I.) or £6.50 (Europe/Scandinavia) with your address or phone number and we will contact you same day by phone or letter with quote, if you prefer, please call us and we will give you a quote over the phone, we aim to please. That's what made us the most reliable service centre.

SPECTRUMS REPAIRED for only £19.95 including PARTS · INSURANCE and P & P.

NO HIDDEN EXTRAS

We don't give you a between price and let you guess the bill, we give you a 100% fixed price NO extras. We don't need to boast about our service, we have 1000's of customers from all over the world highly delighted with our service and help. Only 20 minutes from Manchester Centre. BBC, Commodore 64, Vic 20, also repaired call us for details.

Don't wait weeks for your repair, we turn around all computers in 24 hrs. All repairs carry a full 3 month guarantee, plus on every Spectrum we repair, we send you a free game worth £5.95 for your enjoyment and pleasure.

- While you wait service by Professional Computer Engineers.
- 3 month written guarantee on all repairs.
- International Repair Company. We repair computers from all over the world.
- All computers sent by Mail Order turned around in 24 hrs.
- Most Spectrums repaired within 45 minutes.
- All Micros insured for return journey.
- Keyboard faults only £8.95
- School repairs undertaken - discount available.
- Free software with each Spectrum repaired.
- Over 8 years experience working with computers. All computers fully tested.

TRADE
REPAIRS
most
welcome

BEST SERVICE — BEST PRICES!

COMMODORE 64

* NOW REPAIRED *

Call us for details or purchase the I.C.'s from our D.I.Y. section

WE ONLY USE SINCLAIR
SPARES. FITTED BY OUR
QUALIFIED STAFF!

THE
LOGICAL
CHOICE

SPECIAL OFFER!

YOU CAN'T REFUSE

16K to 48K Upgrade

Upgrade your 16K Spectrum to 48K Spectrum for only £19.95 fitted including V.A.T. and P.&P.

(Limited offers while Stocks Last.)
Makes a great Christmas present.

To order the Upgrade Kit,
(only £17.95.)



P.S. We would like to wish all our customers past and present a very Merry Christmas and a Happy New Year.

THERE'S
NOBODY QUICKER
IN THE BUSINESS AT PRICES
THAT CANNOT BE
BEATEN

VideoVault D.I.Y. CORNER

We regret we cannot show all the components available. Just give us a call and we can quote you over the phone, delivery by return.

Spectrum Parts

280A CPU	3.00
4116 Rams	0.95
ZTX 650	0.60
Service Manuals	20.00
ULA 6C001	9.50
Transistor ZTX 213	0.30
Transistor ZTX 313	0.50
Keyboard Membrane	3.00
Keyboard Template	3.00
Keyboard Mat	5.00
Power Supply Units	7.95
Feet (Each)	0.25

Commodore 64 Chips

6526	23.00
6510	23.00
6581	23.00
901227-03	23.00
901226-01	23.00
901225-01	23.00
6569	23.00
4164 Rams	3.00
Power Supply Units	29.00

All prices + P & P. £1.50
But include V.A.T.

*SPECIAL KEYBOARD UPGRADE



Why not upgrade your Spectrum into a new keyboard, we can upgrade your old Spectrum into a new D.K. Tronics keyboard

for only £31.50 which includes fittings + return P.&P. and V.A.T.
Normal retail price £39.95 without fitting

ORDER
NOW!

STOP
PRESS

VIDEOVAULT LTD will shortly be opening their New Branch in Manchester City Centre for while you wait computer repairs, watch this space for details of Special opening offers.

VIDEOVAULT HEALTH WARNING!!!

Sending your computer to any other Repair Centre can seriously Damage its Health

TRADE
ORDERS
WELCOME

OPEN
7
DAYS
A
WEEK

VideoVault Ltd.

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

FREE GAME WORTH
£5.95 WITH
EACH SPECTRUM
REPAIR.

CLASSIFIED

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

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

SOFTWARE

★ ★ KNIGHT LORE 2 ★ ★

(The Conquest of Fairlight)

For 48K Spectrum & Spectrum +

Join Sabre man in his latest quest as he battles against all odds to save the castle of Fairlight. Knight Lore 2 Features 3D Graphics, Amazing Animation, Filmmation and all the favourite features of the original game.
(Note this software needs a copy of Knight Lore for protection of copyright reasons).

"More playable than the original Knight Lore" M. Whitting

All this for only:

£3.95

HIGH VOLTAGE AND P&M SOFTWARE PRESENT

★ ★ THE DESIGNERS COLLECTION ★ ★

For 16K or 48K Spectrum and Spectrum +

Now with this amazing program you can completely redesign Knight Lore. Jet Set Willy, Manic Miner, Chuckle egg and Hungry Horace so that you can create your own unique games not recognisable with the original game. No programming skill necessary.

"Very usefull utility... Very easy to Use." P.C.W.

"Excellent!" N. J. Sholley.

"Each one is worth the price paid for all eight" C. Bedford.

The Designers Collection is supplied on a C30 tape and costs only:

£4.95

CHALLENGE 'MANDY' TO THE No. 1 SMASH HIT GAME

★ ★ STRIP PONTOON ★ ★

For BBC 'B', Electron, Spectrum 48K and Spectrum +

(State which version you require when ordering)

If you win enough she strips off item by item in superb hi-res. graphics with her favourite tune playing in the background. Now in its 10th month this cult game is still selling well.

"Excellent!" Mr P. Kleser

Each version still costs only:

£2.99

Group For Research Into Paranormal Experiences

Present:

★ ★ WITCHCRAFT REVEALED ★ ★

For BBC 'B', Electron, 16K or 48K Spectrum, Spectrum +

(State which version you require when ordering)

Now you can practice this ancient craft in your own home and become your own budding warlock/witch. Perform many different rituals and spells which have been collected together after much research from authentic witches and warlocks. This program includes the binding sex spell, the romantic love spell, the spell for extremely good luck and fortune and the ultimate ritual for Astral projection. Over twenty five spells and rituals are in this great package.

An incredible investment of only:

£4.95

Send your cheque/cash/postal order to:

HIGH VOLTAGE

Dept. PCW, 16 Bridge Road, Park Gate, Hants, SO3 7AE

Or enclose a S.A.E. for further details on our products and competition details.

(Details also supplied with an order)

PL702

ASTROLOGY for beginners only £11.50

A Starter Pack comprising a simple program to calculate a horoscope, an introductory booklet & 2 self-teaching programs (how to interpret the horoscope)

No previous knowledge required

Spectrum, BBC/Electron, Oric, Dragon, Tandy/Genie, Commodore 64/PET, Atari, Sharp, Amstrad/Schneider, Colour Genie MSX, IBM, etc.

many more programs for
experienced astrologers
also other micros

Cash with order (add 50p outside UK) or large s.a.e. for free catalogue to—

ASTROCALC (Dept PCW)

67 Peascroft Road

Hemel Hempstead, Herts HP3 8ER

Tel: 0442 51800

PL792

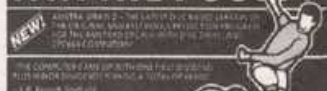
SPECIAL OFFER FOR ATARI 400/600/800 OWNERS

Hire first 2 games FREE from our extensive range of software. Latest releases! Apply now! Also, Atari hardware & modems for sale at discount prices.

For further details send SAE to
CHARWOOD GAMES, 30A WARWICK
AVENUE, QUORN, LOUGHBOROUGH
LEICS.

TEL: 0509 412604

WIN THE POOLS?



NEW!
ASTROCALC 2 - THE ONLY POOL PROGRAM IN THE WORLD!
THE COMPLETE AND UP-TO-DATE GUIDE TO THE POOLS!
A 16K ROM COPY

- Supplied with Database containing data on over 12,000 matches since 1900!
- 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 lead likely drivers for those who prefer to bet on fixed odds!
- Built in perm generator - complete your coupon direct from the screen!
- Compatible with the Oric's speech synthesiser - the only pool prediction program to read you its predictions!
- Each copy is individually updated with all results up to the date of dispatch - no typing in enormous lists of previous matches before using the program!
- Full after sales service, including Database updates and end of season upgrades!

AMSTRAD-DRAW 2 (ON DISK ONLY) £10.95

ORIGINAL AMSTRAD-DRAW ON TAPE (NO SPEECH) £9.95

(Cheques/P.O.s payable to B. S. MCALLEY)

AMSTRAD-DRAW (Dept D), 1 Cowheze, Chinner, Oxford OX3 4TD

Tel: 0844 52426

SANTAS GROTO (C-64) A seasonal adventure co-starring Esmerelda for £3.75 disk or £2.75 tape from Woodsoft, 106 Blackbridge Lane, Horsham, West Sussex.

POOLS AID

BY TAMASSY

FOR THE COMMODORE 64

● CONSIDER THESE FACTS:

1. Teams are both promoted and relegated each season.
2. In 1871/72 Wanderers beat Royal Engineers 1-0.
3. The venue for the 1986 World Cup is the Aztec Stadium, Mexico City.

All very interesting, but they won't help you win the pools.

- POOLS AID is different - although fun and easy to use (with on-screen prompts and menu driven selection), it cuts through the jargon and concentrates on TODAY'S RESULTS.

- Using up-to-date statistics and the authors' experience, IT WILL GUIDE YOU TOWARDS CERTAIN VICTORY - The sky's your limit with POOLS AID

- So cut out the guesswork and do it the easy way with POOLS AID

● NOW THAT'S A FACT

£14.50 tape, £15.50 disk version. Cheques or POs to:
TAMASSY, 33 MATHER STREET, BLACKPOOL,
LANCS FY3 8RA

PL675

EX81 POOTER PUZZLER

4 First Programs
containing
21 PUZZLES
only £2.95

OTHER EX81 TITLES...
MUZE OF POOTER £1.95
Computer generated prose
on a ZX81/HANDLES £1 Fun
guessing game for age 7+ . French
version on side 2. BINARY BRAINS
PL01 £1 Aid to understanding binary numbers.
ORDER NOW and avoid the Christmas rush!

All software post free - Send
4-6 S.A.E. for more information. **POOTER GAMES** 24 PARLOES AVENUE
DAGENHAM RM9 5NX

POOTER GAMES 24 PARLOES AVENUE
DAGENHAM RM9 5NX

SPECTRUM 48K

AN ADVENTURE
WITH A DIFFERENCE!

'MASTERCLASS'

NO FANTASY
NO RANDOM ELEMENTS
STRICTLY LOGICAL AND
ROOTED IN REALITY

Please send cheque or P.O. for £4.95 to

TRINITY SOFTWARE

177 BIRCHFIELD ROAD, PERRY BARR
BIRMINGHAM B19 1LL

HINTS, POKES, MAPS, COMPETITIONS! AMSTRAD/BBC, COMMODORE, SPECTRUM

Monthly handbooks packed with hundreds of hints, tips, pokes, competitions etc on today's games. Choose the Handbook(s) that interest you:

Amstrad/BBC Handbook	£1.25
Spectrum Arcade Handbook	£1.00
Spectrum Game Review Handbook	£0.75
Spectrum/Commodore Adventurer	£1.00
Commodore Arcade Handbook	£1.00
Commodore Game Review Handbook	£0.75

For our latest issues send cheque/PO made payable to H&D Services to: H&D SERVICES (PCW), 1338 Ashton Old Road, Higher Openshaw, Manchester M11 1JG (Tel: 061-370 5666).

PL638

KNIGHT LORE EDITOR Runs on all AMSTRADS

This excellent utility will allow you to completely redesign every single graphic and room in Knight Lore. This program will bring life back into those same old screens.

100 percent Machine Code.
Knight Lore Editor can be yours on cassette with instructions for only £5.00. P&P free.

Send Cheque/P.O. to:

GEDIT SOFTWARE

28 Mistover Road, Wareham

Dorset BH20 4BZ

Telephone: Wareham 6824

PL62

WDSoftware

FOR THE QL

WD Utilities (3rd ed)

PRINT 60 file DIRECTORY or view it on one screen, one-key LOAD, COPY or PRINT 60 files with one key (allows for namesakes). Multiple FORMATTING to prevent corruption by stretching of tape. TOOLKIT to give dated, numbered modules in program development. PRUNE old files to release space (one key DELETES a file). Full instructions in QULL file. Use up to 6 EXTRA MICRODRIVES (add on your Spectrum ones!)

WD Utilities for CST Q-Discs (2nd ed)

As above, with extra utilities, 100-file capacity, for CST/Computamate disc systems AND up to 4 extra microdrives. User-friendly timesavers. Update 1st ed for 25p (£1.25 outside Europe).

RefQL (5th ed)

900 useful QL references in an ARCHIVE file (too long to share cartridge with other software). Also ARCHIVE 2 search program.

FOR SPECTRUM/QL/BBC/ELECTRON

WD Morse Tutor

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

FOR SPECTRUM 48K

WordFinder (microdrive/disc only)

For CHEATING at crosswords. Finds M-as-g letters, solves anagrams of shingle words. 13,000 word vocabulary. 10-letter word ending in ATE? No problem! Too long to share a cartridge with anything else.

Tradinwind

Sailing/trading strategy game with graphic surprises.

Jersey Quest

Text adventure with Bergerac and the Dragon. Based on genuine folklore of the Island of Jersey. (Not on SPDOS). Prices (incl Europe postage - elsewhere add £1). Cassettes - base price only. QL or Spectrum Microdrives - £2/cartridge plus base price; 5.25" floppies £2, 3.5" floppies £4 plus base (SPDOS/Beta/OPUS discs for Spectrum). State required format when ordering. ACCESS/MasterCard welcome (over £4).

Two or more programs on one medium - pay medium + base. E.g. WD Utilities and Morse on microdrive for £11.50, but IMPOSSIBLE to mix QL/BBC/Spectrum programmes on one medium. Send YOUR cartridge and base price, but FORMAT it FIRST 5 times like us for reliability.

WDSoftware, Hilltop, St Mary, Jersey.

Tel: 0534 81392

PL480

FOR HIRE

MIDLAND COMPUTER LIBRARY

A SUBSIDIARY OF PLATINUM GOLD

- * OVER 4,000 different titles available for hire for the COMMODORE, SPECTRUM, BBC, AMSTRAD, ATARI and MSX computers.
- * ARCADE, ADVENTURE, EDUCATIONAL and BUSINESS software too.
- * HIRE PRICES from only 75p INC P & P.
- * 20% DISCOUNT off all purchase software.
- * FREE CATALOGUES.
- * FREE HINTS AND TIPS.
- * FAST RETURN OF POST SERVICE (if reserves are given).
- * ALL GAMES manufactured ORIGINALS with full documentation.
- * OVER 6,000 satisfied members.
- * EUROPEAN members welcome.
- * LIMITED PERIOD ONLY FREE MEMBERSHIP.
- * Fully computerised system keeps track of your order. We pride ourselves in being the most professional Hire Library in the United Kingdom, with staff of 14 who know what the word service means. Backed by our own software company and programmers.

PL715

MIDLAND COMPUTER LIBRARY:
28 COLLEGE STREET, WORCESTER, WR1 2LS.
TEL: 0905 611072.

Please rush me my free catalogue stating machine.

Name:

Address:



VISA

ACCESSORIES



SPECIAL



FROM **85p** EACH **BRAND IN SEE 10 CASE**

- 5 1/4" DS/DD FLOPPY DISKS
- LIFETIME GUARANTEE
- HUB RINGS
- FREE SEE-10 CASE
- NT BRANDED - FUJI FILM

PRICE PER BOX
1-4 5-9 10+

£9.50 £8.90 £8.50

8" DD diskettes 100 each min order 50
AUTHORISED: Sanyo - Philips - Alternative -
Sage - Easylink - Mannesman - Juki -
Dealers

HOW TO ORDER: To total add 50p per box of 10 postage then add 15% VAT and send cheques or postal orders to:

Newtrends Technology Ltd
10/14 Hollybush Gardens
London E2 9QT
Tel: 01-729 4999

PL717

BLANK CASSETTES

WITH LIBRARY CASES	C10	C15	C20	C30
10	3.80	4.00	4.15	4.15
20	7.00	7.20	7.35	7.50
50	15.00	15.20	15.35	15.50
100	27.00	28.00	29.00	29.00

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

5 1/4" DS/DD DISKS

10 for £12.00 inc plastic case

RING US NOW! (0793) 695034
UK HOME COMPUTERS, 82 CHURCHWARD AVE,
SWINDON, WILTS SN2 1NH PL613

THIS SPACE
FOR SALE

£28 (inc. VAT)

TELEPHONE:
PCW CLASSIFIED
01-437 4343 Ext 206 PL363

FOR SALE

* CHRISTMAS BARGAINS *

MEMOTECH MTX512 COMPUTER:

A superior designed computer. Suit novice or professional. 64K Ram. 16 Colours
Z80 Processor. Fully Guaranteed.

ONLY £99.09p

PRINTERS (PANASONIC TYPE 1090)

A Near-Letter-Quality DotMatrix Printer made by Panasonic under licence. 80
cps. True descenders, Friction & Tractor Feed. Centronics: Parallel Interface.

BARGAIN AT £175.00

SPECTRUM DISK DRIVE PACKAGE:

Comprises of The Beta Magic Button Disk Interface. 250K Single Sided Drive.
Cables, & 10 free 5.25" Disks for

£195.00p.

Other Drives available. Orders Enquiries to:

UK HOME COMPUTERS (dept.PCW)
82 Churchward Ave. Swindon, Wilts. 0793 695034

PL790

YOUR PERSONAL CENTRONICS PRINTER



- DRAFT MATRIX PRINT
- NEAR LETTER QUALITY
- SUBSCRIPT SUPERScript
- CONDENSE EMPHASIZE
- 96 CHAR + 48 EURO + 16 MATHS
- GRAPHICS
- OPTIONAL TRACTOR

128 Station Rd
Gloucester
LE3 8NR

ROCK HALL

TEL: (0533) 313531

RADIO WATCH



LATEST TECHNOLOGY

- Super fun
- Multi-function digital watch
- Tuning control
- Smart black finish
- Size 30 x 30 x 5mm
- Money back if not totally satisfied
- Complete with headphones

Send to:
SUPERIOR MAIL ORDER (WCC)

4 Parkway Close
Wetmore Garden City
Herts. AL9 8BJ

BUT HURRY! LIMITED STOCK

SEND SAE FOR PRODUCT LIST

PL03

INTERCONTINENTAL SPECTRUM REPAIRS

Spectrum/Plus From £12.00*
Interface 1 £17.50 inc parts
Interface 2 £12.00 inc parts
Upgrade 16k to 48k £30.00 inc parts
*Send coupon only for estimate
Other items sent with charge PD to:
P.E.A.K. ELECTRONICS, 32 Clifton Avenue,
Hartlepool, Cleveland TS26 9QN. Tel (0492) 72739
Previous phone add £8.50 pph PL606

THE BEST VALUE PRINTER OFFER!!

NEW EPSON P40
ONLY £50.75 INCL. VAT!

- 45 cps
- Enlarged & condensed print
- Emphasised print
- Normal & double density graphics
- 80 column in condensed mode
- Uses roll paper
- No ribbon to ever change
- Uses NiCad recharg. batteries
- Complete with mains adaptor
- Choice of parallel or serial (state which)
- 12 month warranty

Please add £7 insured delivery

Orders to:

TIGER SOFTWARE
6 NORTH HILL WAY, BRIDPORT,
DORSET DT6 4JX
Telephone: (0308) 23655
See our advertisement on Page 00

PL07

Quick-Count Limited

15 Neeld Crescent, London NW4 3RP Tel: 01-202 5486

Grand Clearance Sale

- | | | |
|---------------------------------------|------|----------------|
| Six ex-dem SX-64 Computers | each | £299.00 |
| excellent condition | | |
| Six ex-dem MPS801 Printers | each | £75 |
| excellent condition | | |
| One only new (unboxed) SX-64 computer | | £399.00 |
| One only new (unboxed) 1541/MPS801 | | |
| peripheral pack | | £185.00 |

50 only - Cash Traders' basic Book-keeping System - Commodore approved for
C64. Trial balance, Final Accounts, VAT Account (Retailers schemes A, B and F)

Purchase Day Book, Weekly Takings.

(was £89.70) - now only **£19.95!!**

N.B. Advanced Cash Traders' Bookkeeping now **£99.00**
(All prices include VAT and exclude carriage)

Quick-Count Ltd., 15 Neeld Cres., London NW4 3RP
01-202 5486 (24-hr. ans mc.)

PL04

SERVICES

**SPECIAL
XMAS OFFER!**

2 GAMES (WORTH £10) WITH EVERY REPAIR

NOTE OUR PRICES AND WATCH

REPAIRS BETWEEN
£9 AND £20

EXPRESS SPECTRUM & BBC REPAIRS!

OTHERS FOLLOW THE LEADER

in all U.K. with
While-u-Wait repairs!

with INTERNATIONAL repair service!

to charge **LOW PRICES** for the smaller repairs!
(e.g. £9 for keyboard faults)

FOR SPEED - "One firm at least can effect any necessary repairs over the counter in 45 minutes. Based in Manchester, MANCOMP can offer what is arguably the **FASTEST** turnaround in the business to personal callers" CRASH Magazine JUNE 1985.

FOR LOW PRICES - "My Spectrum blew recently. I took it to MANCOMP, who fixed it in 8 minutes! and for less than £10! They are local, 'clued up' and blindingly efficient!" 4 HEATONS DIGEST.

FOR REPUTATION & HELPFULNESS - "I have come across a firm that will be more than willing to advise you as to how to remedy your problems. They are called MANCOMP and as well as repairing faulty Spectrums, are also quite willing to discuss your problems with you and offer reasonably cheap and more importantly **CORRECT CURES**" Phil Rogers POPULAR COMPUTING WEEKLY JAN 85.

FOR PROFESSIONALISM - "Of all the repair companies 'Sinclair User' spoke to, MANCOMP seemed the **MOST PROFESSIONAL** when it came

to advice and a helpful attitude" AUG 85.

FOR HONESTY - We let you watch your computer being repaired and if there is nothing wrong with it, we will tell you!!!

THIS IS WHY Spectrum users from London, Cornwall, Scotland, Birmingham, Liverpool, Coventry, Leicester, Glossop, I.O.M., etc. AUSTRALIA, AUSTRIA, BELGIUM, EGYPT, EIRE, GERMANY, HOLLAND, KUWAIT, NORWAY, PAKISTAN, PAPUA NEW GUINEA, SAUDI ARABIA, SWEDEN, SWITZERLAND and ZIMBABWE - send their Spectrums to MANCOMP for repair!

• **24 TURNAROUND** • **NO-QUIBBLE GUARANTEE**
• **NO HIDDEN COSTS.**

EXTRA-SPECIAL DISCOUNTS FOR EDUC. INST.,
H.M. FORCES, CHARITIES, HOSPITALS, ETC!

WHY DELAY? For FREE no-obligation estimate PHONE OR
SEND YOUR SPECTRUM TO
MANCOMP FOR THE FASTEST
AND CHEAPEST REPAIR
SERVICE AROUND!

MANCOMP LTD
(Dept PL45)

Printworks Lane, Levenshulme,
Manchester M19 3JP
Phone 061-224 1888.
OR 061-224 9888.
OPEN MON - SAT 9am to 7pm
WE ALSO REPAIR APPLES, I.B.M.s,
APRICOTS and EPSON & OLIVETTI
PRINTERS!!



The 1st choice

REPAIR YOUR OWN SPECTRUM. Or start your own business. 52 loose leaf pages inc: Membrain replacements, memory checking, circuit diagrams, voltages, suppliers etc. Send 12 x 9 envelope with 40p stamps plus £4.95 to: G. Stewart, 22 Blenheim Drive, Warton, Lancs. PR4 1DH.

CHILTERN COMPUTER SERVICE

FOR FAST RELIABLE REPAIR SERVICE
SPECTRUM £18.00

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

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

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

Overseas enquiries welcome

PL261

Computer Repairs in Southend

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

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

MINNIE MICRO ELECTRONICS
12 EASTERN ESPLANADE,
SOUTHEND, ESSEX.

Tel: (0702) 62033/615809
OPEN 7 DAYS A WEEK

PL473

BBC SPECTRUM REPAIRS

★ Spectrum repairs £18.50 inc. parts insurance and p.p.
★ BBC B repairs £18.50 + parts, insurance and p.p.
Send your computer with cheque or P.O. for £18.50 and description of fault to:

SUREDATA (PCW)

Computer Service
45 Wychwood Avenue, Edgeware,
Middx.

Tel: 01-951 0124

PL53

COMPUTER REPAIRS

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

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

Spectrum £18.75 inc parts
ZX81 £11.50 inc parts
16 KRam £9.95 inc parts
Microdrive £15.95 inc parts
Interface 1-11 £18.75 inc parts

also

BBC £22.00 + parts
Electron £19.95 + parts
XX Memory Expansion Kit £15.95

Computer Retailers please phone
for Special Trade Price.

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

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 Commodore, Amstrad and Spectrum £8.45. Free details from: Discus Software, Freepost, Beach Approach, Brixham TQ5 8BR. Tel: 0808 455532.

Computer Repair Centre

Have you got problems with your computer? Then call us for:

Commodore, BBC,
Spectrum, Dragon

Mail order or call in

Enfield Communications

135 High Street, Ponders End, Middx
Tel: 01-805 7772

PL143

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

SPECTRUM REPAIRS

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

R. A. ELECTRONICS,

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

PL45

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

SCOTLAND'S No 1

For home and personal computer repairs
Specially fast Spectrum service!

★ Same day for most faults
★ 1 hour if delivered personally
★ Free estimates
★ Upgrades, Membranes and P.S.U.'s
★ 3 mth. warranty on work done
Also BBC/CBM/ORIC and PERIPHERALS.
Call, write or phone:

MICRO-SERV

Unit 4, Denny Workspace, Denny,
Scotland FK8 6DW
(0324) 823468

Trade, schools and club discount given.

PL442

AMSTRAD and BBC software for hire
keen prices, extensive lists, further details M. Ryall, 1569 Stratford Road, Hall Green, Birmingham B28 9JA.

MAKE YOUR PROGRAMS MAKE MONEY!

If you have a game, utility or application to sell, with a view to publishing (particularly CBM64 or BBC B) phone

JOHN COOK at:
Popular Computing Weekly
on: 01-437 4343

PL 42

Access

**Book
your
Classified
or
Semi-display
advert by
Credit
Card**

**Call
David
Osen
on
01-437 4343**

VISA

**FREE
SPECTRUM
REPAIRS??
SEE MANCOMP AD
ON THIS PAGE**

PL548

Amstrad

1	(4)	Formula One Simulator	(Mastertronic)	£1.99
2	(3)	Soul of a Robot	(Mastertronic)	£1.99
3	(-)	Grand Prix 3D	(Software Invasion)	£9.95
4	(2)	Nonterraqueous	(Mastertronic)	£1.99
5	(-)	They Sold a Million	(Hit Squad)	£9.95
6	(1)	Finders Keepers	(Mastertronic)	£1.99
7	(10)	Chiller	(Mastertronic)	£1.99
8	(-)	Spy vs Spy	(Beyond)	£9.95
9	(5)	Way of the Exploding Fist	(Melbourne House)	£9.95
10	(-)	Willow Pattern	(Firebird)	£3.95

Atari

1	(1)	Super Zaxxon	(Datasoft/US Gold)	£9.95
2	(8)	Rescue On Fractalus	(Activision)	£9.95
3	(3)	Chop Suey	(English Software)	£9.95
4	(9)	Summer Games	(Epyx/US Gold)	£9.95
5	(2)	Ballblazer	(Lucas/Activision)	£9.95
6	(-)	Decathlon	(Activision)	£9.95
7	(-)	Whirlwind	(US Gold)	£9.95
8	(5)	Bounty Bob Strikes Back	(Big 5/US Gold)	£9.95
9	(-)	Strip Poker	(Artwork/US Gold)	£9.95
10	(10)	Theatre Europe	(PSS)	£9.95

BBC

1	(3)	Strike Force Harrier	(Mirrorsoft)	£9.95
2	(1)	Match Day	(Ocean)	£9.95
3	(4)	Elite	(Acornsoft)	£12.95
4	(-)	Mini Office	(Database)	£5.99
5	(-)	Computer Hits (10)	(Beau Jolly)	£9.95
6	(2)	Beach-head	(Access/US Gold)	£9.95
7	(9)	Revs	(Acornsoft)	£14.95
8	(6)	Monopoly	(Leisure Genius)	£12.95
9	(10)	Bored of the Rings	(Silversoft)	£8.95
10	(7)	Combat Lynx	(Durell)	£9.95

Commodore 64

1	(1)	Winter Games	(US Gold)	£9.95
2	(3)	Fighting Warrior	(Melbourne House)	£9.95
3	(5)	Racing Destruction Set	(Ariolasoft)	£12.95
4	(2)	Monty on the Run	(Gremlin Graphics)	£9.95
5	(-)	Last V8	(Mastertronic)	£1.99
6	(6)	Summer Games II	(Epyx/US Gold)	£9.95
7	(4)	Who Dares Wins II	(Alligata)	£7.95
8	(-)	Beach Head II	(Access/US Gold)	£9.95
9	(-)	Never Ending Story	(Ocean)	£8.95
10	(-)	Barry McGuigan's World Championship Boxing	(Activision)	£9.95

Spectrum

1	(-)	Elite	(Firebird)	£14.95
2	(1)	Monty on the Run	(Gremlin Graphics)	£9.95
3	(-)	Back to Skool	(Microsphere)	£6.95
4	(3)	Daley Thompson's Super Test	(Ocean)	£6.95
5	(5)	Way Of The Exploding Fist	(Melbourne House)	£9.95
6	(2)	Impossible Mission	(Epyx/US Gold)	£9.95
7	(-)	Saboteur	(Durell)	£8.95
8	(4)	Starquake	(Bubble Bus)	£6.95
9	(6)	Fairlight	(The Edge)	£9.95
10	(7)	Fighting Warrior	(Melbourne House)	£9.95

Bubbling Under

Gyroscope/Spectrum (Melbourne House); Computer Hits (6)/Spectrum (Beau Jolly); Scarabaeus/C64 (Ariolasoft); Tau Ceti/Spectrum (CRL); Waterloo/C64/Spectrum (Warmaster); Imhotep/C64 (Ultimate); I of the Mask/Spectrum (Electric Dreams); Spike/Spectrum (Firebird); Battle of Britain/Amstrad (PSS).

All figures compiled by Gallup/Microscope

Top Twenty

1	(-)	Elite (Spectrum/C64/BBC/Electron)	Acornsoft/Firebird
2	(1)	Winter Games (C64)	Epyx/US Gold
3	(2)	Monty on the Run (Spectrum/C64)	Gremlin Graphics
4	(8)	Formula One Simulator (Spectrum/C64/Amstrad/C16)	Mastertronic
5	(3)	Fighting Warrior (Spectrum/C64/Amstrad)	Melbourne House
6	(4)	Way of the Exploding Fist (Spectrum/C64/Amstrad)	Melbourne House
7	(-)	They Sold a Million (Spectrum/C64/Amstrad)	Hit Squad
8	(9)	Ten Computer Hits (Spectrum/C64/Amstrad/BBC/Electron)	Beau Jolly
9	(5)	Finders Keepers (Spectrum/C64/Amstrad/MSX)	Mastertronic
10	(7)	Frank Bruno's Boxing (Spectrum/C64/Amstrad)	Elite
11	(-)	Neverending Story (Spectrum/C64/Amstrad)	Elite
12	(6)	Impossible Mission (Spectrum/C64)	Epyx/US Gold
13	(11)	BMX Racers (Spectrum/C64/C16)	Mastertronic
14	(-)	Back to Skool (Spectrum)	Microsphere
15	(10)	Action Biker (Spectrum/C64)	Mastertronic
16	(-)	Thunderbirds (Spectrum/C64)	Firebird
17	(-)	Chiller (Spectrum/C64/Amstrad/MSX)	Firebird
18	(13)	Daley Thompson's Supertest (Spectrum)	Ocean
19	(12)	Hacker (Spectrum/C64/Amstrad/Atari)	Activision
20	(-)	Saboteur (Spectrum)	Durell

Figures compiled by Gallup/Microscope

Readers' Chart No 51

1	(1)	Way of the Exploding Fist (Spectrum/C64/Amstrad/Melbourne House)	
2	(2)	Fairlight (Spectrum)	The Edge
3	(5)	Hypersports (Spectrum/C64)	Imagine
4	(5)	Red Moon (Spectrum/C64/Amstrad/BBC/Electron)	Level 9
5	(-)	Monty on the Run (Spectrum/C64)	Gremlin Graphics
6	(4)	Now! Games (Spectrum/C64)	Virgin
7	(3)	Bored of the Rings (Spectrum/C64/BBC)	Delta 4/Silversoft
8	(7)	Frank Bruno's Boxing (Spectrum/C64/Amstrad)	Elite
9	(-)	Nightshade (Spectrum)	Ultimate
10	(9)	Flight Simulator II (C64)	Sub-Logic

Winning Phrase No 51: "Hello Tosh, got a new Amstrad?" from Robert Dunning, of Middlesbrough, Cleveland who wins £25. Honourable mentions to R Robertson of Mossend, Lanarkshire with "Garfield - world's stoutest feline" and Hazel Williams of Sevenoaks, Kent with "Wot no pop? Laser explodes at sea - get my drift?"

Now voting on week 53 - £25 to win

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

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

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

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

Voting for Week 53 closes at 2pm on Wednesday November 27 1985. Entries received after that time will not be eligible for inclusion in that week's voting. The judges decision is final. Only one entry per individual per week will be allowed.

Name	My top 3: Voting Week 53
Address	1.....
.....	2.....
.....	3.....
My phrase is:	

Sir Fred



A severe attack of Chivalry
on a Moonlit Knight

The Olde 48K Spectrume £9.95

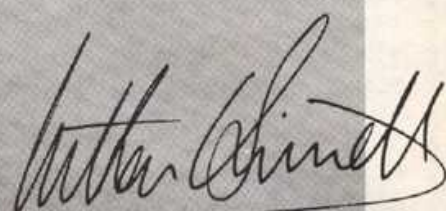
"WHEN IT COMES TO SOFTWARE-I LIKE TO BE FIRST ON THE BALL"

Here's what's in the December issue:

Reviews of all **latest games**, a survey of **top home micros** and **software** and **programs** for owners of **Sinclair, Amstrad, Commodore** and **Acorn machines**.

Plus a special voucher offer giving you discounts on great software from **Virgin Games**.

MAKE SURE YOU'RE FIRST ON THE BALL, GET **YOUR COMPUTER** TODAY!!



LUTHER BLISSETT
ENGLAND WATFORD

OUT NOW!

NOW WITH **MORE GAMES** FOR **MORE MACHINES**

INTRODUCING A NEW **MID-PRICE** RANGE OF HIGH PERFORMANCE PROGRAMS

5 GREAT TITLES

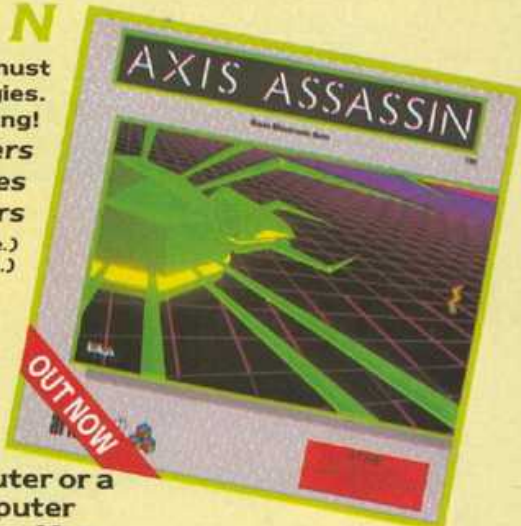
All Disks **£9.95** each All Cassettes **£7.95** each

AXIS ASSASSIN

The Master Arachnid controls a swarming mindless army of killers. You must face them alone. Be faster. Fiercer. Deadlier. There are no rules. No strategies. Your only goal is to survive – or die trying!

- Over 100 increasingly difficult battles ● Kamikaze Hunters
- Relentless Web Spinners ● Robot Drones
- Spores who divide into mutant guards ● Xterminators

COMMODORE 64 (Disk and Cassette.)
ATARI (Disk – coming soon on Cassette.)



D-BUG

D-Bug is a game within a game in a computer within a computer. There you are playing an action/strategy game called Gotcha! against the computer or a friend. Suddenly, the D-Bug computer operating the game breaks down. You must then discover the fault and fix the 'Bug' causing the problems.

COMMODORE 64 (Disk and Cassette.)
ATARI (Disk – coming soon on Cassette.)

KAISER

Imagine yourself in the year 1700. You are the ruler of a small German province. You manage crops and estates and you lay down all the economic and social laws. The more successful you are, the higher you climb in the hierarchy of the nobility, gradually becoming more and more powerful, in order to take control of the whole of Germany as the Kaiser.

AMSTRAD (Cassette.) COMMODORE 64 (Disk and Cassette.)
ATARI (Disk and Cassette.)



SAUCER ATTACK

Alien flying saucers are attacking Washington D.C. Your job is to destroy them by firing energy balls at them. Unlike most games however, the saucers score each time one of your fireballs misses. You must score enough points to get a chance of knocking out the mothership and save the city – happy fire-balling!

COMMODORE 64 (Disk and Cassette.)

BUG BLITZ

Your mission is to find and destroy an army of mutant bugs who have made their homes in caverns deep beneath the planet's surface. A labyrinth of dangerous tunnels leads you down to these caverns which you must negotiate skillfully in your spaceship. Once you've destroyed the bugs in a cavern, you must return through the tunnels to the planet's surface.

But beware – the surface itself is not safe – it's covered with a network of randomly pulsing energy fields that can easily destroy your spaceship.

- 4-Way Scrolling Map ● Separate Caverns ● Inertia Bombs
- Multi-Screens ● Increasing levels of difficulty

COMMODORE 64 (Disk and Cassette.)



THE ARIOLASOFT MID-PRICE SERIES – GREAT PROGRAMS – GREAT VALUE

Available from all good software retailers – if it's not there, please order it – or in case of difficulty, send your crossed cheque/P.O. made out to Ariolasoft U.K. Ltd., including your own name and address, To Ariolasoft U.K. Ltd., Suite 105, 106 Asphalte House, Balcon Street, London, SW14 5BX.



ONLY THE BRAVEST FLY....

TOMAHAWK

New, from the author of Fighter Pilot... a stunningly realistic helicopter simulation that puts you in command of an Apache Advanced Attack helicopter. You will learn to take off, to land, to manoeuvre and locate and destroy enemy tanks using Hellfire anti-tank missiles. You will experience authentic battlefield conditions as you endeavour to carry out your mission and return safely to base.

BY D.K. MARSHALL

48K SPECTRUM

Digital Integration would like to thank McDonnell Douglas for all their help and technical support.

£9.95

inc. p&p & VAT



Spectacular 3D cockpit view with over 7,000 ground features.
Authentic aerobatic performance.
Ground attack and air-to-air interception, with laser guided missiles, rockets and 30 mm. gun.
Doppler navigation and target tracking.
Day/Night vision systems.

Cloudy, Crosswinds, Turbulence.

Pilot ratings — Trainee to Ace.

Impressive sound effects.

Pilots Notes.

Twin Joystick Option.

FREE HELICOPTER FLIGHT Competition

Entry forms & full details inside every pack.
2 First Prizes of a trip in a helicopter.
20 Runner-up Prizes of Apache model kits.
Closing date Feb. 15th, 1988.

SPECTRUM

- | | |
|------------------------|---------------------------------|
| Tomahawk 48K | <input type="checkbox"/> £9.95 |
| Night Gunner 48K | <input type="checkbox"/> £6.95 |
| Fighter Pilot 48K | <input type="checkbox"/> £7.95 |
| COMMODORE 64 | |
| Speed King Disk | <input type="checkbox"/> £12.95 |
| Speed King Cassette | <input type="checkbox"/> £9.95 |
| Fighter Pilot Disk | <input type="checkbox"/> £14.95 |
| Fighter Pilot Cassette | <input type="checkbox"/> £9.95 |
| AMSTRAD CPC 464 | |
| Fighter Pilot | <input type="checkbox"/> £8.95 |
| Fighter Pilot Disk | <input type="checkbox"/> £13.95 |

Cheques payable to Digital Integration Ltd

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

Name _____

Address _____

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

Or debit my Access Account No.

Tele Sales
(0276) 684959



Trade and Export enquiries welcome.
Lifetime Guarantee.

Please send to

DIGITAL INTEGRATION

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



CLASSIFIED

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

GAMES SOFTWARE

READERS own games. We market the best ones. Send S.A.E for confidential reply. Megasoftware, PO Box 20, Barrow, Cumbria.

Spectrum 48k - XMAS 85 - Spectrum 48K

TWO IN ONE for all AGES and TASTES. **PARTY MAGIC - Disco Screen.** Turn down the lights. Play any kind of music into your Spectrum and simply be amazed as the music controls and produces FABULOUS images. DISCO mood for the PARTY, or RELAX mood for those quieter moments. A + PLUS +.

TOP SECRET - Hack Attack. Want to STOP, STUDY, MODIFY, EXAMINE programs over the holiday. Powerful STOPPING routines plus mcode disassembler, Hex-Dec converter, Headerless, info, and Trade Protection Secrets.

Only £7.95 for BOTH on TAPE.
Microdrive £9.95. Overseas + £1.00p

Commodore 64 - XMAS 85 - Commodore 64

PLUS 64 - PLUS 64 - PLUS 64

SEVEN IN ONE COMPUTER UPGRADE KIT Toolkit, Sound/Graphics Kit, Combined Kit, Mach, Code Kit, Monitor Kit, Sound Kit, Sprite Kit + RESET switch. ADDS numerous new BASIC commands. Allows simple control of Sound and Sprites (with Animation). Mach. Code tools incl. Monitor, Assembler, Memory Transfer, and Programme Protection.

Only £7.95 (Fast Load) TAPE
£9.95 on DISK. Overseas + £1.00p

Cheque or P.O. to Franklin Software, 49 Marlbrook Lane, Bromsgrove, WORCS. PL7 2RN

AMSTRAD

IDLE MEDDLER FOR AMSTRADS

THE MEDDLER, the delightful tape utility has now been upgraded to include TAPE to DISC transfer and HEADER INFORMATION. A number of other refinements for TAPE to TAPE have been added. IDLE MEDDLER now offers:

Choice of six tape speeds, plus a special binary save. DEPROTECTION, alters FILENAMES to suit AMSDOS. RELOCATES automatically A full HEX and CHAR screen dump from ROM or RAM is included. Now all you need in one program, get that long leader on to DISC or FAST TAPE automatically. Still only £4.50 inc by return from: NEMESIS (PCW), 10 CARLOW RD, RINGSTEAD, KETTERING, NORTHANTS NN14 4DW. PL601

AMSTRAD 3in disks £35 box of 10 inclusive, cheques/POs to Simon Stable, 20 West End, Launton, nr Bicester, Oxfordshire.

RECRUITMENT

OVERSEAS WORK OPPORTUNITY

The British School of Lami, Togo, West Africa is urgently seeking a computer enthusiast to supervise children working in the school's computer centre. A good understanding of Commodore 64 BASIC and the idiosyncrasies of the machine is necessary. Free furnished accommodation close to the school, return airfare, salary of £200 per month. Would ideally suit a mature student taking a year off who is interested in programming.

Apply by letter stating full personal details, availability and computing experience and other interests together with a recent photograph to: U.K. Secretary, 25, Hall Lane, Merseyside L31 3DY.

The names of two referees should also be included.

PL66

FOR SALE

DRAGON 32, Delta DOS, disk drive, integrated assembler, 80 column Dot matrix printer, joysticks, software, books etc., £300. Write: Ian King, Derwent.

BBC and **Amstrad** software for hire, keen prices, extensive lists. Write to M. Ryall, 1569 Stratford Road, Hall Green, Birmingham B28 9JA.

DISK COMMANDER 64 utility disc, unscratch delete directory, endless directory, disc protector, +11 more. Full instructions, £10. Brampton, Croome Road, Defford, Worcestershire.

BBC B1.2os DNFS Disc-Doctor 100k d/d 20in colour TV software, £150 + plus, £450 ono. 3in d/d £30 each. Ring Kash after 6.30pm Mon.-Fri. anytime Sat/Sun 01-577 6020.

DUPLICATION

FAST reliable service of DATA-DUPLICATION for most computers. Comprehensive facilities include: erasure; re-recording; blank discs/cassettes; blank or printed labels; intays. COMPETITIVE PRICE-LIST from:-



PL395

COMPUTER PROGRAMS

REAL-TIME or (Slow) HIGH SPEED professional Cassette Duplication and Blanks 1 to 1,000+. Computer printed cassette labels, BDC Disk copying 1 to 500+. Fast Security Delivery Service. jbs records—a division of FILTERBOND LTD. 10 Sadlers Way, Hertford SG14 2DZ. 0992 551185

PL397

DIARY

Event	Dates	Venue	Admission	Organisers
Acorn User Christmas Show	November 22-23 10.00am-6.00pm	Central Hall London SW1	£2.00 adults £1.00 children (in advance)	Editionscheme 01-346 6568
Third 6809 Show	November 23-24 10.00am-6.00pm	Royal Horticultural Hall London SW1	£2.00 adults £1.00 children (in advance)	Editionscheme 01-346 6568
Christmas Microfair	December 14	Horticultural Hall London SW1	£1.75 adults £1.25 children	Mike Johnston 01-801 9172

The Rogue Program



It's fragments scattered the Universe, silent tomb-stones to the Maxins existence. Until in sector FIC3 of Maxin's known Universe a crystalline segment entered a small green planet's atmosphere; a planet YOU CALL



Created entirely using a BBC micro and a AMX mouse

continued next week

New Releases

STOP-GAP

Fighting Warrior, one of the most truly violent games, I have ever seen, has now been converted to the Commodore 64 with impressive results.

The Spectrum original was a sort of mini *Way of the Exploding Fist* where you marched along beating the brains out of a series of mythical adversaries. Its thump thump thump as you inflict blows to any vulnerable part of the opponent's body.

The Commodore version lacks some of the fine graphics detail of the Spectrum original but makes up for it with bigger and more varied graphics. It features a particularly vicious dog that goes straight for the throat as well as the nasty half beasts, half men that fight more conventionally, eg, with big sticks.

For Commodore owners just getting a fraction tired of *Way of Exploding Fist* after playing it continuously, this

could prove a useful stopgap.

Program *Fighting Warrior*
Price £9.95
Micro Commodore 64
Supplier Melbourne House
Castle Yard House
Castle Yard
Richmond
Surrey

FUTURISTIC

Why don't people like the Atari? Old as the machine is many of the games on it still look excellent. A case in point is *Elektra Glide* from English Software.

This is one of the most addictive, high speed, adrenalin raising road games I've yet seen.

It's hard to convey its magic by describing the plot, which is simply driving along the track watching out for a host of futuristic obstacles that will come your way. These include strange monoliths and bouncing balls; you will have to watch for their shadow and steer quickly to one side to avoid.

The game is played in sections, with a time limit to reach each one. Time is tight, so you have to go as close to flat out as you can manage. Watch out too for the tunnels which you must steer slickly through.

The plot isn't the point, however, the game is beautifully designed with a clever sense of travelling through a vast landscape. Graphics and graphic scrolling is particularly fine without the sudden jerks found on similar games.

Pick of the week

A HARD LINE

If all educational software was like *Yes Chancellor* from Chalksoft, things would be different. Though definitely educational, this program is just about the most entertaining economy management game I've ever played.

The idea is to run the economy - raising money and deciding where it should be spent. This involves keeping everyone happy (happy enough for you to be voted back in again in the fifth year of office), balancing tax revenue against public sector spending and wage demands.

Within the confines of what is possible with a program which essentially only consists of text and numbers this program is well presented, intelligent use has been made of colour to differentiate problem areas from those that need attention and within each section there is a brief resume of the kind of options you have, eg, lowering taxes makes everyone happy but can have bad effects on inflation.

There are various sections to the game, trade, public spending, government stocks, tax thresholds and the inevitable wage bargaining. This latter section has produced some of the most vicious reactions in the office from some or



dinarily liberal to leftist people I've ever seen. Suffice to say that a harder line was taken in fiction than Mrs T would ever dare to take in real life.

Survive long enough and you really do get a feel for how it all fits together, albeit in simplified form. You also learn the cynical lessons - if it's election year you don't raise taxes... If you or your children are studying economics this is a must. If you have enjoyed management games in the past, then this is one of the best ever.

Program *Yes Chancellor*
Price £17.50
Micro BBC (on disc)
Supplier Chalksoft
PO Box 49
Spalding
Lincs PE11 1NZ



This Week

Program	Type	Micro	Price	Supplier	Program	Type	Micro	Price	Supplier
Don't Panic	Arc	Amstrad	£3.95	Firebird	10 Pack Vol 2	Arc	Commodore 64	£10.00	Automata
Cauldron	Arc	Amstrad	£3.95	Palace	10 Pack Vol 3	Arc	Commodore 64	£10.00	Automata
Chimera	Arc	Amstrad	£3.95	Firebird	Chicken Chase	Arc	Commodore 64	£3.95	Firebird
Dummy Run	Arc	Amstrad	£8.95	Mikro Gen	Chimera	Arc	Commodore 64	£3.95	Firebird
Willow Pattern	Arc	Amstrad	£3.95	Firebird	Sabre Wulf	Arc	Commodore 64	£9.95	Firebird
Quiz Guest	Ed	Amstrad	£7.95	Alligata	Thunderbirds	Arc	Commodore 64	£3.95	Firebird
Ball Blazer	Arc	Atari	£9.95	Activision	Underwulde	Arc	Commodore 64	£9.95	Firebird
Centre Ville	Ed	BBC	£17.50	Chalksoft	Wild West	Arc	Commodore 64	£9.95	Ariolasoft
Early Maths	Ed	BBC	£7.95	Willow	Willow Pattern	Arc	Commodore 64	£3.95	Firebird
Early Words	Ed	BBC	£7.95	Willow	Yaks Progress	Arc	Commodore 64	£9.45	Llamasoft
Forensic	Ed	BBC	£17.50	Chalksoft	Star Drifter	Arc	Electron	£3.95	Firebird
Fat Man Sam	Arc	BBC B	£3.95	Firebird	Chicken Chase	Arc	Spectrum	£3.95	Firebird
Microcosm	Arc	BBC B	£3.95	Firebird	Chimera	Arc	Spectrum	£3.95	Firebird
Star Drifter	Arc	BBC B	£3.95	Firebird	Don't Panic	Arc	Spectrum	£3.95	Firebird
					Three Weeks Paradise	Arc	Spectrum	£9.95	Mikro Gen

New Releases

The sound is similarly impressive, rhythmic and driving.

I found myself playing this one again and again and car games usually bore me. A Commodore version is apparently well on the way; on the strength of this, I'd expect it to be a winner.

Program *Elekra Glide*
Price £8.95
Micro Atari
Supplier English Software
1 North Parade
Parsonage
Gardens
Manchester M60

LOW LEVEL

Though not quite *Sorcery*, *Cauldron* is nevertheless a fine Amstrad program. The task, to collect six ingredients to turn your low level hag into the Witch Queen, involves a mixture of arcade shoot'em ups with Willy style timing



skills. It's a good conversion from the Commodore though may be a fraction slower.

What makes the game is the quality and detail of its graphics and the way the balance between straight zap 'em to bit (bats in this case) and collecting/dodge challengers. Simply flying your hag takes a little mastery - broomstick aerodynamics require a clearing and a run for take off although, conversely, landing seems to be possible on a VTOL basis.

Our hag was bugged such that at one point she went into a perpetual spin whilst accumulating points, though this should be corrected in recent versions. Hag stability problems aside, the game is a lot of fun and is another one of those titles that improves when it's converted to the Amstrad.

Program *Cauldron*
Price £7.95
Micro Amstrad
Supplier Palace Software
275 Pentonville
Road
London N1

ROLE-PLAYER

I would guess that the majority of people reading this have heard of a game called *Dungeons & Dragons*. For those not in the know, its scenario is based in a Tolkien-like world where you play the part of an adventurous individual and explore dark dungeon complexes to fight evil monsters and generally get rich quick.

The only problem with the system is that you need a games-master to plan out and guide you through the adventure, and also several other people to make up a party of adventurers.

Now imagine playing something akin to this against your computer. In the upper left of your screen you have a 3D line display of the maze, maybe showing a fearful skeleton approaching you. You study the map in the right hand window - no place to run. Try talking to it - no good. No weapons handy... try a fireball. Kerblammmmm... you have the satisfaction of knowing you have made the world a nicer place... even though there does seem to be something creeping up behind you. Imagine all this... and you're getting near to *Swords & Sorcery*.

Yes... *Swords & Sorcery*... the game that was due out a year ago, etc, etc. Well, it's finally arrived, and all that programming has produced the answer to the lone role-player's prayer. In fact, if you are remotely interested in adventuring - and have a spare tenner - then *Swords* must become a serious contender for the Christmas present you would most like to buy yourself.

Program *Swords and Sorcery*
Price £9.95
Micro Spectrum
Supplier PSS
452 Stoney Stanton
Rd
Coventry

HAIRPIN

It was just like Christmas in the *Popular* office this week. First Commodore *Revs*, and now four new tracks for the original *Revs* on the BBC B: Brands Hatch, Donington Park, Snetterton and Oulton Park. All lovingly recreated by original *Revs* author Geoffrey Cramond. The results are amazingly realistic.

The systems works by first loading up the *Four Tracks* tape - and selecting one of the four from a menu. More data is then loaded in - and finally you are asked to load the game itself. It is important to note that you must already possess a copy of *Revs* to use the extra four tracks!

I immediately tried out Brands Hatch. That right-hander after the pits suddenly dips down and you're falling... then up to the hairpin... carefully round that, then full out down the hill again to tackle Graham Hill bend at full tilt. Just like for real - only, if your neck is at stake, you tend to go a lot slower.

Expect to crash a lot - just like before you got used to Silverstone - if you are a *Revs* fan then this can be classed as an essential purchase this Christmas.

Program *Revs Four Tracks*
Price £9.95 (cassette)
£12.95 (disc)
Micro BBC B
Supplier Acornsoft
Fulborn Rd
Cherry Hinton
Cambs

This Week

Computer Wordsearch S	Spectrum	£6.95	Softfirm
Icon Graphix	Ut	£9.95	Audiogenic
The Last Word	Ut	£15.50	Myrmidon

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

Activision, 15 Harley House, Marylebone Road, London NW1, 01-486 7588. Alligata, 1 Orange Street, Sheffield S1 4DW, 0742 755796.

Ariolasoft, Retail. Audiogenic, 39 Sutton Industrial Park, London Road, Reading, Berks 1AZ, 0734 664646. Automata, 27 Highland Road, Portsmouth, Hants PO4 9DA, 0705 735242. Chalksoft, 37 Willowsea Road, Worcester WR3 7QP, 0905 55192. Firebird, Wellington House, Upper St Martin's Lane, London WC2H 9DL, 01-3796755. Llamasoft, 49 Mount Pleasant, Tadley, Hants, 07356 4478. Mikro Gen, 44 The Broadway, Bracknell, Berks, 0344 427317. Palace, 275 Pentonville Road, London N1, 01-278 0751. Softfirm, 21 Ashbourne Way, Thatcham, Berks, RG13 4SJ. Willow, The Willows, Wroughton Lane, Congresbury, Bristol BS19 5BQ, 0934 834056.



Is it poetry?

*The grillroom splashed and splashed.
Unbearably,
Some tiny bloodstain shrank and buck-
led, but
I dripped. You tickled my soft country. I
Eroded the pure wretched bead,
although
Some aged garment smashed my heart,
and yet
That smart soap drank some pain, while
still we came . . .*

By line two of this nonsense, you'd probably guessed that it was computer-written. In fact, I've trained my Spectrum to produce the stuff by the yard. It's verse - reasonably regular iambic pentameter, to be technical. But is it poetry?

Once, at a party, a guest told FR Leavis, fiercest of Cambridge English dons, that computers could now be programmed to write poetry. He replied with utter frostiness that anyone who believed that could have no conception of what a poem was. After all, he had spent his life trying to convince a not very interested world that a great poem, the result of a poet's complete dedication both to the truth and to the language with which he must express it, was the finest, most serious form of art conceivable.

Which is just one reason why it is interesting to see what actually can be programmed. My Spectrum's verses above started with a simple algorithm for producing grammatically correct English sentences from an arbitrary collec-

tion of nouns, verbs, prepositions, etc. Then I found a way of making them dance (rather clumsily) to the measure that is commonest in English verse. It would not be at all hard to program alliteration or most of the other technical devices of poetry.

What, however, is rather absent from the lines above is meaning. In the terms used by experts in linguistics - or Artificial Intelligence - it is all right as syntax, hopeless as semantics. The connections suggested by the sentence structure are quite arbitrary, and bear no relation to any reality.

This need not always be the case, however. Computers are quite capable of producing sensible Artificial Intelligence; researchers have made progress on providing them with detailed scenarios corresponding to aspects of the real world. I could have included in my program some indication of the class of objects that are able to splash (dolphins, or paddle-wheels, or water-buffalo) and the computer could easily be told to hunt for a sensible and appropriate noun, rather than grab the first that happens to fit the metre - in this case, grillroom.

Computers may be good at retaining detailed and accurate facts, but they are not at all famous for being original, profound or amusing. Human beings, on the other hand, can frequently produce utterances that are true yet astonishing and delightful, because they have continuous access to a fascinating and rich world through five senses simultaneously. Computers don't know anything that someone hasn't, directly or indirectly, told them. They're like an extreme case of swots, who remember everything teachers tell them, but never look at the world they live in.

Will this always be a limitation of machines? Or one day will they be able to make sense of the world without human interference? And if so, could they ever communicate to us the actual quality of their perceptions? It's remotely possible, but I don't think the communication would be much like human literature.

George Simmers

Puzzle No 184

The number 864 is very interesting! The sum of its digits (18) multiplied by the product of its digits (192) is equal to four times itself. Other numbers with this property are 18 and 45.

Can you find, apart from the trivial case of 1, two numbers such that, in each case the sum of the digits multiplied by the product of the digits is exactly equal to that number itself?

Solution to Puzzle No 179

Of the possible 1296 different throws obtainable with four standard dice, 992 of them will result in a score of seven with any two, three, or all four dice. The remaining 304 combinations will not. This can be reduced to 62 out of 81 'hits' and 19 out of 81 'misses'. In other words, you would have slightly better than three winning chances out of four!

```
10 LET HIT=0:LET MISS=0
20 FOR A=1 TO 6
30 FOR B=1 TO 6
40 FOR C=1 TO 6
50 FOR D=1 TO 6
60 IF A+B=7 OR A+C=7 OR A+D=7 OR B+C=7 OR
   B+D=7 OR C+D=7 THEN LET HIT=HIT+1:GOTO 100
70 IF A+B+C=7 OR A+B+D=7 OR A+C+D=7 OR
   B+C+D=7 THEN LET HIT=HIT+1:GOTO 100
80 IF A+B+C+D=7 THEN LET HIT=HIT+1:GOTO 100
90 LET MISS=MISS+1
100 NEXT D
110 NEXT C
120 NEXT B
130 NEXT A
140 PRINT HIT,MISS
```

As with most assessments of winning odds, there are many pitfalls, so the program generates all possible throws obtainable with four dice and tests each one of them. Line 60 tests for combinations of any two dice, Line 70, any three of the dice, and Line 80 all four. The fact that certain throws, such as 1,1,6, and 6 result in more than one possible way of achieving the required total does not affect the overall odds.

Variables *Hit* and *Miss* are incremented as appropriate, and after all possible throws have been examined, the results are printed out.

Winner of Puzzle 179

The winner is M F Greenwood of College Terrace, Halifax, who will be receiving £10.

Rules

The closing date for Puzzle 184 is December 18.

The Hackers



adventure for commodore64 and spectrum 48k

NO.1 SWORDS & SORCERY



NEW
RELEASE
AVAILABLE
18th NOVEMBER



WIZARDS power level 1 - 10



DRAGON power level 7 - 9



LYTCH power level 6 - 10



WEREWOLF power level 4
a selection of your opponents

SWORDS & SORCERY

Swords and Sorcery represents the first example of the ultimate in graphic adventures using the unique MIDAS system.

Swords and Sorcery differs from other adventures in that you guide your character through the unending corridors of the underworld on a quest for material, physical and/or spiritual power. The choice is yours.

You begin as a novice with limited abilities in the use of magic, sword play and stealth (lock picking, thieving etc).

As you wander the corridors, you will encounter beings meek and mighty, discover untold wealth and worthless trash. Some objects will increase your powers, whilst some will be dangerous and still others will be protected from pilferers (you!) by fiendishly ingenious traps, all designed to help or hinder you on your pilgrimage to power and glory.

There are quests within quests within Swords and Sorcery, for those who want to follow them. Some are given others

must be found, and some are lost causes. There are many ways of opening the gate between the levels of the dungeons. Some are obscure and easy, others obvious and dangerous. The most profitable paths are both. The Ultimate goal of many will be to find the lost armour of Zob, which was un-made by its maker, and its parts scattered across the levels. What, where, how, who and why are answers to be found. All that is known is the prayer of the seekers:

WHEN DARK CABALLUS HIS COUNCILS LEND US
LET NOT THE RED CLUPEA HARANGUE US TURN US
FROM WHAT SEEMS TREMENDOUS AND THUS TO
ZOB'S GREAT TREASURE SEND US.

You need never tire of Swords and Sorcery - when this dungeon can no longer hold you, the next awaits . . . there are a series of expansion modules planned to extend your enjoyment indefinitely.

**Available on Cassette £9.95
SPECTRUM 48K**

(Multi Dimensional Animation System)

MIDAS ADVENTURE CONCEPT

Stunning 3D graphic animation simulating video disk games.

A unique fully interactive adventure language using the latest ARTIFICIAL INTELLIGENCE techniques. State of the art data compression techniques enabling enormous scenarios and vocabularies to be incorporated. Real time Interactive Conflict Sequences. Talk to your opponent, attack them, flee them and even confuse them. Develop your own unique player characters. For example - specialize in magic, swordplay etc.

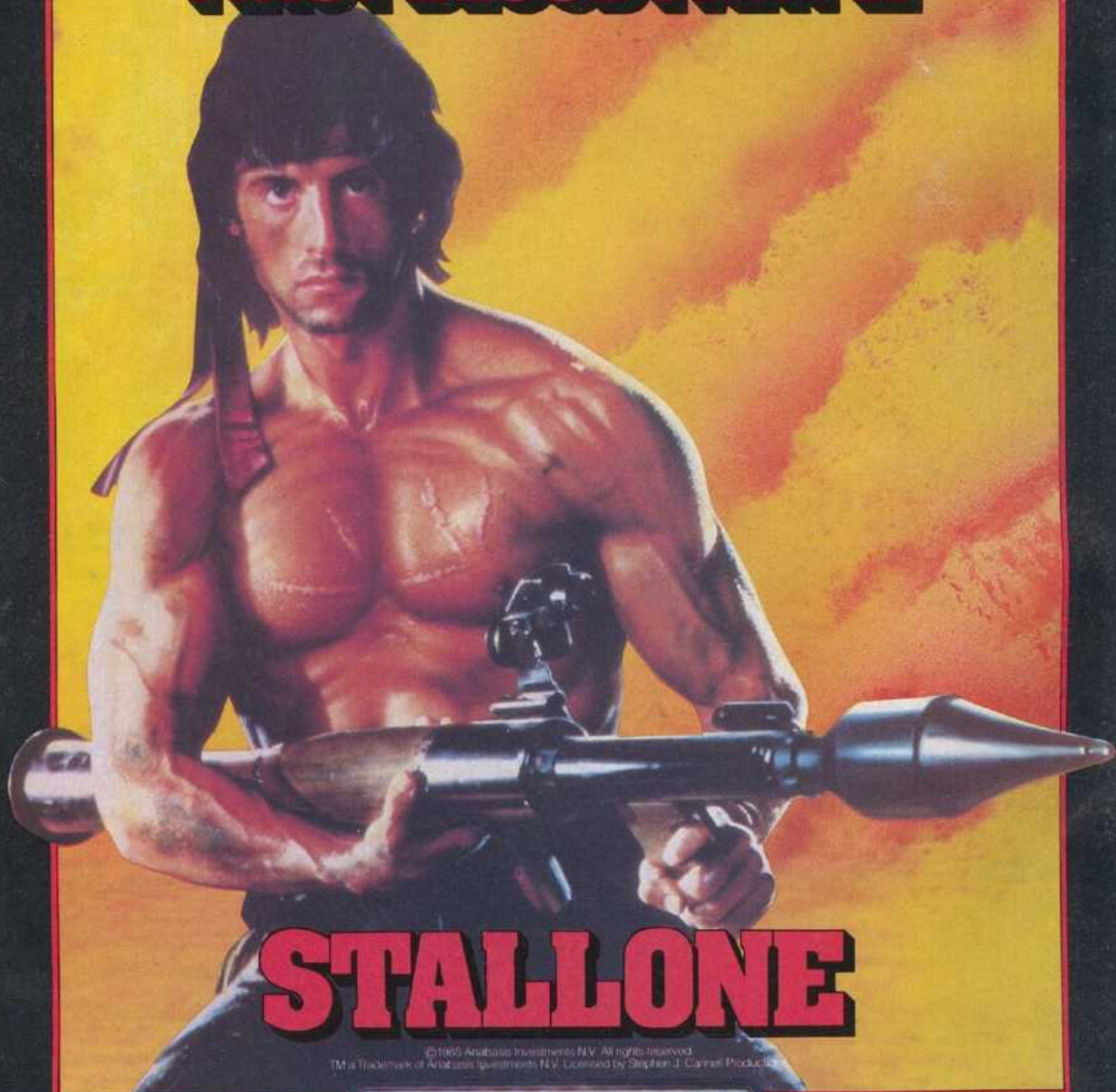
Total expandability - your own characters can be transferred to future adventures and new opponents, scenarios and objects can be added to all the games. A series of expansion modules to increase indefinitely the playing life of each game written with MIDAS.

**Amstrad & Commodore
versions available soon**

RAMBO

TM

FIRST BLOOD PART IITM



STALLONE

©1985 Anabasis Investments N.V. All rights reserved.
TM a Trademark of Anabasis Investments N.V. Licensed by Stephen J. Cannell Productions

SPECTRUM 48k

7.95

ocean

COMMODORE 64 & AMSTRAD

8.95

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

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