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WEEKLY

21-27 November 1985

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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



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 Wignore House, 32 Savile Row, London W1.

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

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

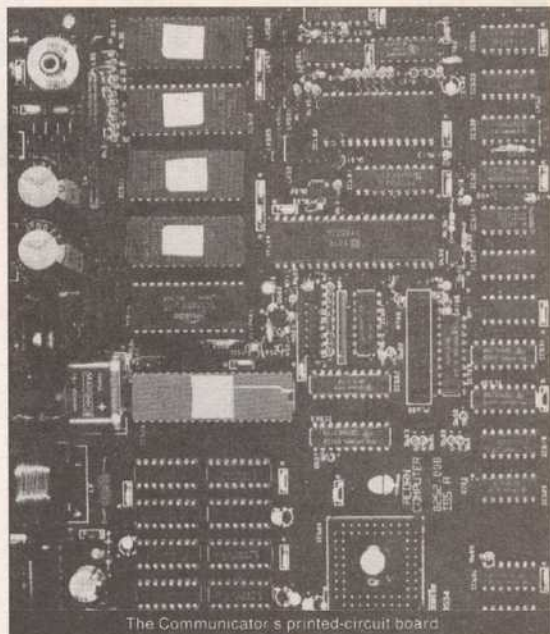
A sophisticated sound sampler using the Amstrad tape machine

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 520ST 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.

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ABC

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- 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

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."

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 Cousens 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.

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



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

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.

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*.

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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 machine 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. You 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

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Micro owned

Prize preferred

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

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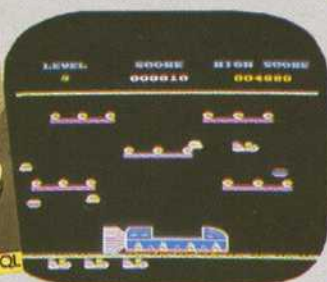


LANDS OF HAVOC A 2,000 plus screen Arcade Adventure described as the first MEGA GAME for the Q.L. Include 9 full colour maps... the book of change... excellent graphics and sound. The arcade style of this game makes it playable by young children and adults alike.

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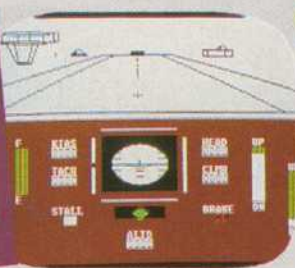
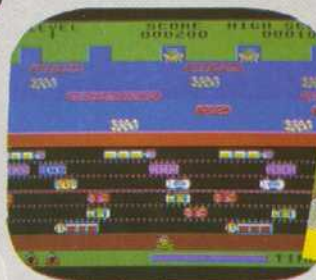


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**Trying to play all the games you can get for the Sinclair
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Because there are more games available for the Spectrum + than any other home computer.

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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

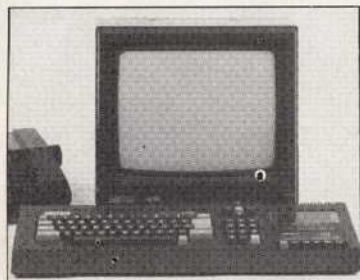
Xmas micro guide

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)

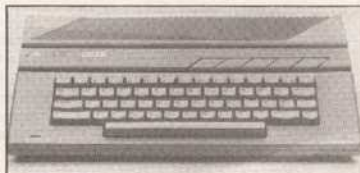
Though remodelled a couple of years ago, the Atari machines (memory is the only difference) have been around for ages - before the Spectrum, in fact. It is testimony to the excellence of the original design that in many ways they are graphically superior to any of the machines in their price bracket 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 to 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	Acom 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)	-	-	£496
John Menzies	£139.99	£199.99 (with Seikooha 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 £198 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 £189 mono	£399 colour £299 mono	£460	£98.99 (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 £288 mono £399 colour £299 mono	£480 £499.99	-	-	-	-	-	-	-
£299 colour £199 mono £299 colour £199 mono	£399 colour £299 mono £399 colour £299 mono	-	-	-	£749.99	Toshiba HX-10 package: £99.99 Toshiba HX-10 package: £99.99	-	-	-
£299 colour £199 mono	-	-	-	-	-	Goldstar: £149 (selected Woolco stores only)	-	-	-
£299 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

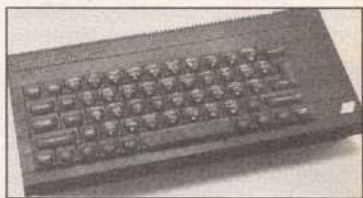
Unrivaled. Not only does virtually every software house in the country produce material for the Spectrum, but some of the most innovative material appears first on this machine. Pioneering work by Ultimate Play the Game amongst others raised the level of what was possible and could be expected from the 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 giving.

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.

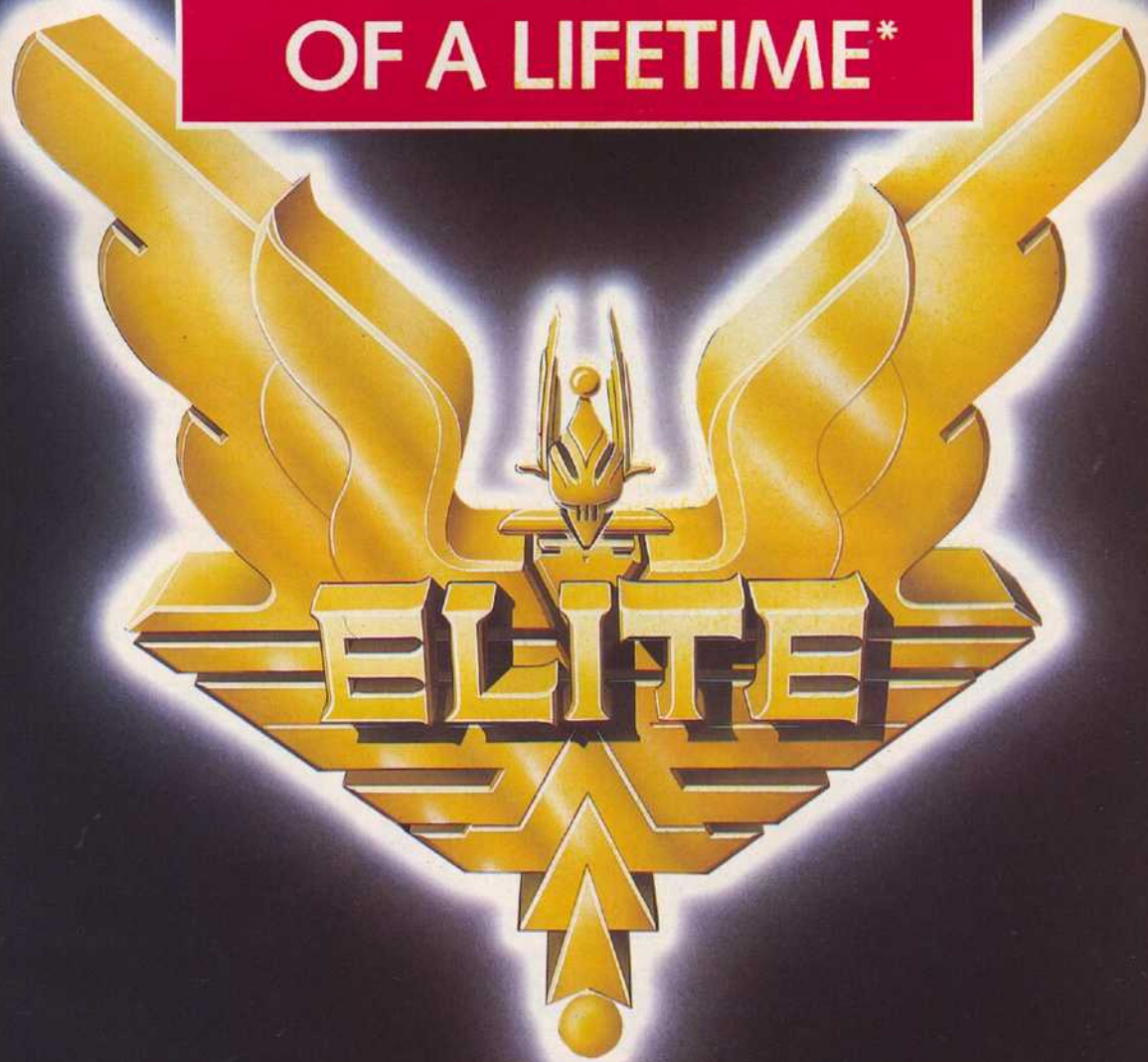
QL

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.



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UPPER ST MARTIN'S LANE - LONDON WC2H 9DL

WINTER SPORTS

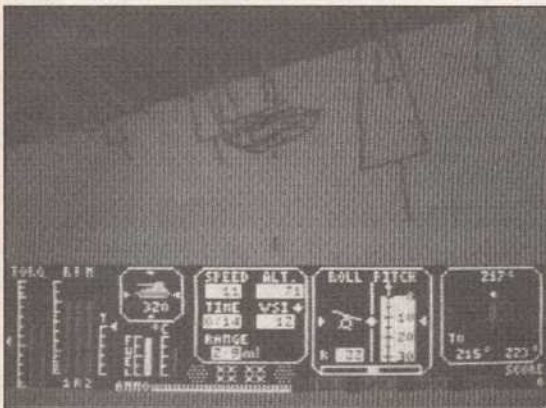
*Ice Hockey, Speed Skating, Ski Jumping,
Down Hill, Slalom, Giant Slalom, Bob Sled, Biathlon.*



*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



Whirlybird

Program Tomahawk Micro
Spectrum Price £9.95
Supplier Digital Integration,
Watchmoor Trade Centre,
Watchmoor Road,
Camberley, Surrey GU16
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

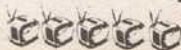
from the place at which it was interrupted. The Multi-Basic Rom provides the BBC user with a similar command, plus much more.

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 chose 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

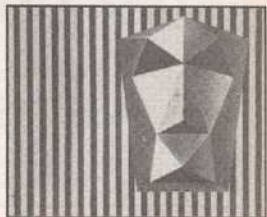
Program *I, of the Mask*
Micro Spectrum **Price** £6.95
Supplier Electric Dreams
 Software, 31 Carlton Cres-
 cent, Southampton, Hamp-
 shire SO1 2EW.

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

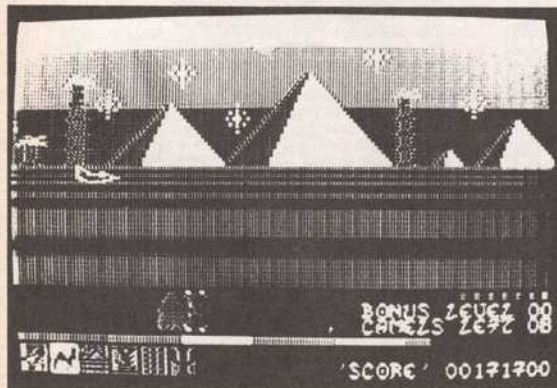
Program *Batalyx* **Micro**
 Commodore 64 **Price** £8.95
Supplier Ariolasoft Retail

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 a 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 *Psychodelia* 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

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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 daterecorder, 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
20 INPUT "Start Address of file? ";sa: RANDOMIZE sa:
POKE 23312,PEEK 23670: POKE 23313,PEEK 23671: PRINT ""
START ADDRESS:";sa: BEEP .1,1
30 INPUT "length of file? ";le: RANDOMIZE le: POKE 23
314,PEEK 23670: POKE 23315,PEEK 23671: PRINT ""
LENGTH:";le: BEEP .1,1
40 DIM n$(16): INPUT "Filename?"; LINE n$: FOR f=1 TO
16: POKE (23295+f),CODE n$(f): NEXT f: PRINT "" F
ILENAME:";n$: BEEP .1,1
100 PRINT "" *LOAD FILE FROM TAPE*: LOAD ""COD
E sa
150 FOR f=1 TO 4e4: OUT 254,PEEK 23672: BORDER 1: IF I
NKEY$="" THEN NEXT f
200 IF sa=16384 THEN PRINT £0;AT 1,0: INK 8: PAPER 8;
"FOUND:- ";n$;" LOADING"
300 RANDOMIZE sa: LET l=USR 65215
9998 STOP
9999 CLEAR 65215: PRINT "LOAD TURBOSAVE ROUTINE": LOAD
""CODE : RUN

```



This boy is a fugitive.



This girl is dangerous.



This lady is deadly.



This man is harmless.



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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,23,18
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

```

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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 &800 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 'setup' 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
150tuneladr=&1100:REM Change these
160tune2adr=&1400:REM addresses to
170tune3adr=&1500:REM suit (see text)
180bufadr=&80C:tuneadr=&BE:REM +&BF
190:
200PROCassemble
210CALL setup
220CLS
230:
240IF FNchecksum<>3265B 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#="SA."+mcfile$+"*STR*interrupt*"
STR#(endcode+1)+*"STR*setup
320PROCcassette("RECORD")
330PROCquery
340IF CX<3 THEN 250
350OSCLI SA#
360*HOTOR 0
370:
380REM checksum should be 3265B
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*tuneladr
580OSCLI tune#
590env#="LOAD "+env#+ "BC0"
600OSCLI env#
610*HOTOR 0
620?switch=1:REM or 2,3 etc (see text)
630CALL changetune
640END
650:
660DEFPROCassemble
670REM PASS=0TD1
680P?=interrupt
690OPT PASS*3 \ change to PASS*2
700:
710.event \ Check if it is the
720CNP #4 \ event we want i.e
730BED 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
870BC 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 (&250)
1030:
1040.event2 \ Otherwise -
\ 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
1130GET notecount \ this tune -but the
1140LDA (tuneadr),Y \ first byte is
1150STA howmany \ how many notes
1160INC tuneadr \ & this is the list
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/Stab-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, Reinford, 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

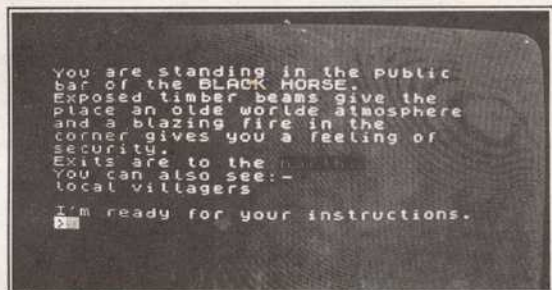
mate knowledge of the characters and locations - for example, the shape of Mark's nose (not entirely unadjacent to that of Concorde!) is not a fact known to millions, but it is a rather important clue in the solving of the adventure.

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 skillfully 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.

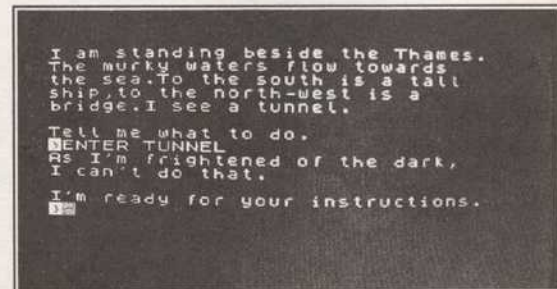
Ghosts

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

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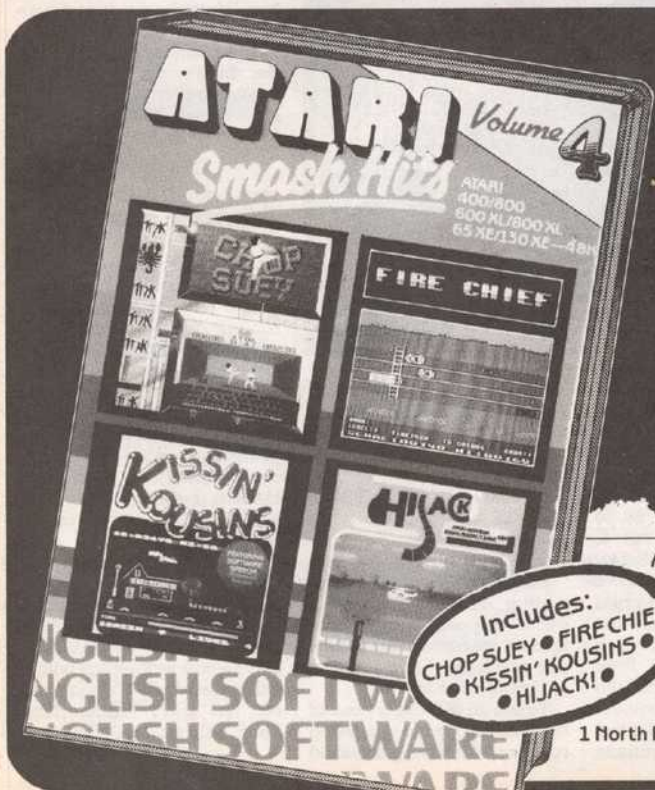
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Entombed

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<>2682 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:-

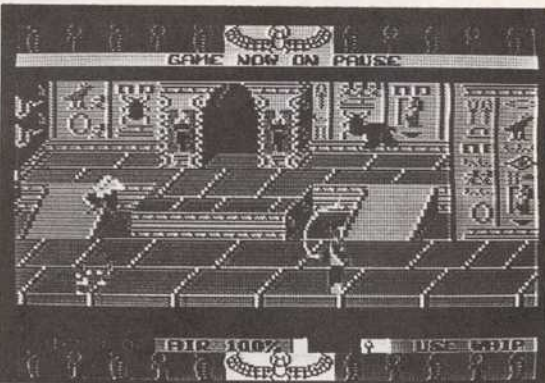
```
10 T=0 : For A=20000 TO 20037 : Read B : Poke A,B : T=T+B : Next 20 For A=2742 TO 2759 : Read B : Poke A,B : T=T+B : Next : If T<>6363 Then Print "ER-
```

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



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, 187, 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

Poke 30590,173 for infinite lives

Poke 28512,132 for infinite energy

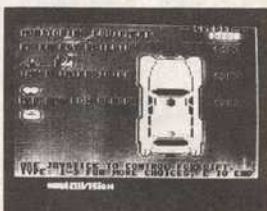
Poke 28341,169 / *Poke* 28342,0 / *Poke* 28343,234 - no collisions

Sys 83085 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

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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.

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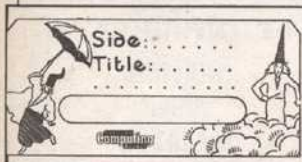
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To find out if you are a prize winner this week this is what you must do:

- 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

```

5 PRINT "Input your personal Micro
  Magic number"
10 INPUT x
15 FOR i=1 TO 3
20 LET a=2+i*(27)
30 LET a=a*27
40 LET y=a*x+1000
45 NEXT i
50 IF y=1176984 THEN GOTO 80
55 IF y=1344360 THEN GOTO 70
60 PRINT "Your matching Micro Magic
  number is"y
65 PRINT "Better luck next week!"
66 GOTO 40
70 STOP
75 PRINT "Your matching Micro Magic
  number is"y
77 PRINT "You have won an Amstrad 6
  128!"
78 GOTO 70
79 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.

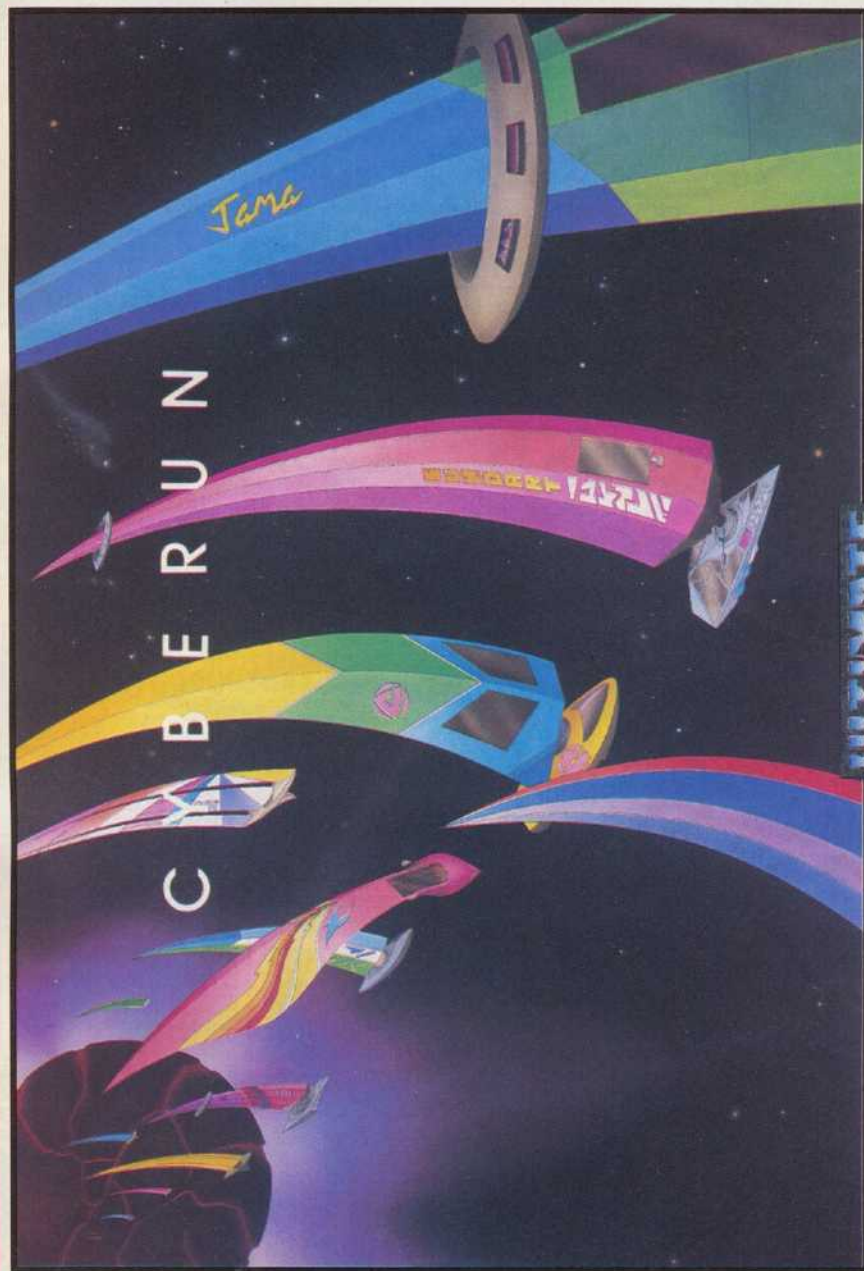
5) If you haven't won this week, don't give up hope. Keep your Micro Magic card and use it to find out if you win with next week's Micro Magic computer program. The same card will last you right through to Christmas, so don't throw it away — you could miss the opportunity to win.

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.

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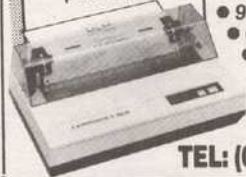
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1	(1)	Winter Games	(US Gold)	£9.95
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Bubbling Under

Gyroscope/Spectrum (Melbourne House); Computer Hits (8); Spectrum (Beau Jolly); Scarabeus/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).

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

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?"

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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



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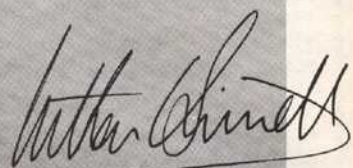
"WHEN IT COMES TO SOFTWARE-I LIKE TO BE FIRST ON THE BALL"

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

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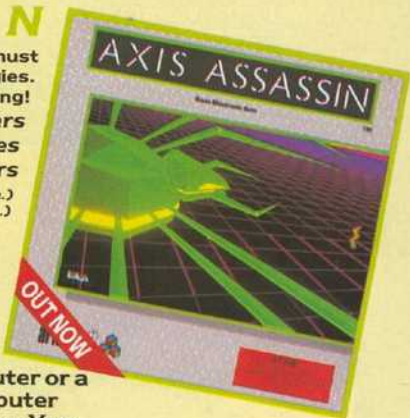
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Third 6809 Show	November 23-24 10.00am-6.00pm	Royal Horticultural Hall London SW1	£2.00 adults £1.00 children (in advance)	Editionscheme 01-346 6566
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The EARTH . . .

New Releases

could prove a useful stopgap.

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



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



ordinarily 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	£3.95	Firebird
Quiz Guest	Ed	Amstrad	£7.95	Alligata	Thunderbirds	Arc	Commodore 64	£3.95	Firebird
Ball Blazer	Arc	Atari	£9.95	Activation	Underworld	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	Liamasoft
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

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

Computer Wordsearch S	Spectrum	£6.95	Softfirm
Icon Graphix	Ut	Spectrum	£9.95
The Last Word	Ut	Spectrum	£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. **Llamosoft**, 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, Writington Lane, Congresbury, Bristol BS19 5BQ, 0934 834056.

This Week



Is it poetry?

*The grillroom splashed and splashed.
Unbearably,
Some tiny bloodstain shrank and buckled,
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



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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.

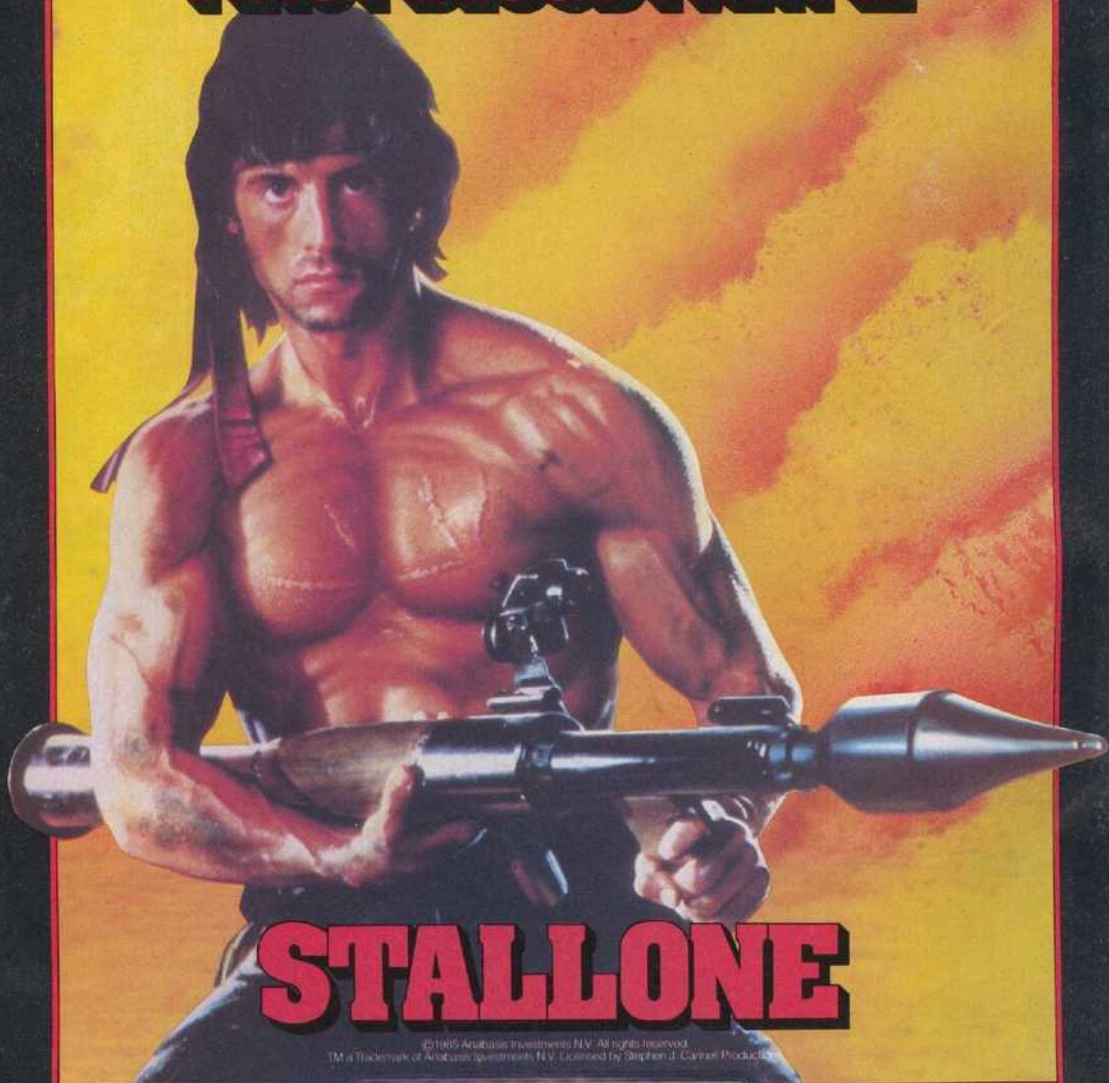
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