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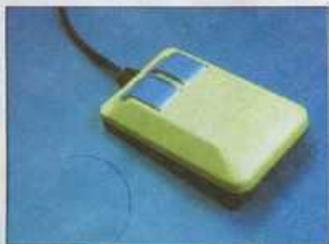
5-11 December 1985

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Vol 4 No 49

THIS WEEK

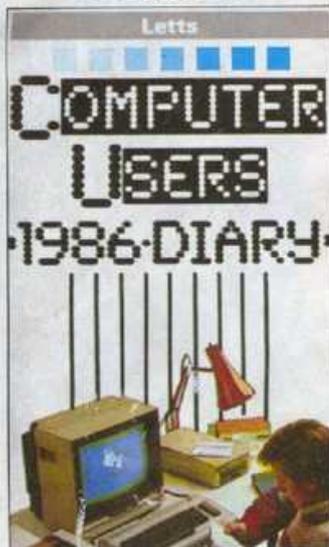
Amstrad sets its sights on IBM



Wigmore's
C64 Mouse



Midi Music
Progress



AMSTRAD is believed to be aiming to tackle IBM head-on with the launch of an IBM PC compatible machine in the Spring next year.

Much of the groundwork for Amstrad's entry into the business computer market has already been done.

The PCW 8256 word-processor model launched by Amstrad in September has established links with office equipment distributors who will be expected to take the

follow-up machine.

Many of the CP/M packages being specifically designed for the 6128 and 8256 will also run on the PC. Mallard Basic, Locomotive Software's language package bundled with the 8256 has already been developed as a 16-bit version for the IBM compatible.

The model is unlikely, though, to run the IBM version of Digital's CP/M, CP/M 86. Frank Iveson, operations manager of Digital Research

said, "All our discussions with Amstrad are about 8-bit machines, there is no 16-bit at all."

Locomotive has also acquired the services of Howard Fisher who was formerly in charge of Acorn's ABC product development. The ABC range, now largely dropped by Acorn, included as its flag-ship model the ABC 310, a fast IBM compatible based on the advanced 80286

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MICRO MAGIC

Lord of the Rings

PART 1 of Lord of the Rings, the long-awaited follow up to *The Hobbit*, is to be released this week by Melbourne

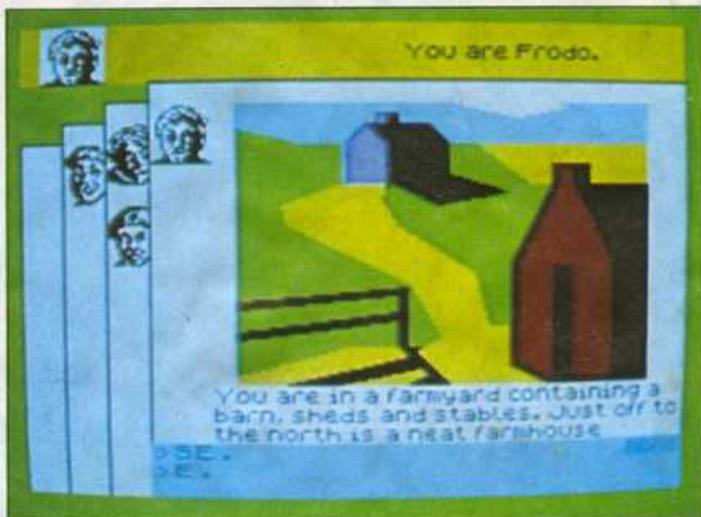
House, for the Spectrum Plus.

The twin-cassette and book package costs £15.95. Full story on page 5.



Find out if you have won an Amstrad 6128 this week or at least some special *Popular Computing Weekly* cassette labels.

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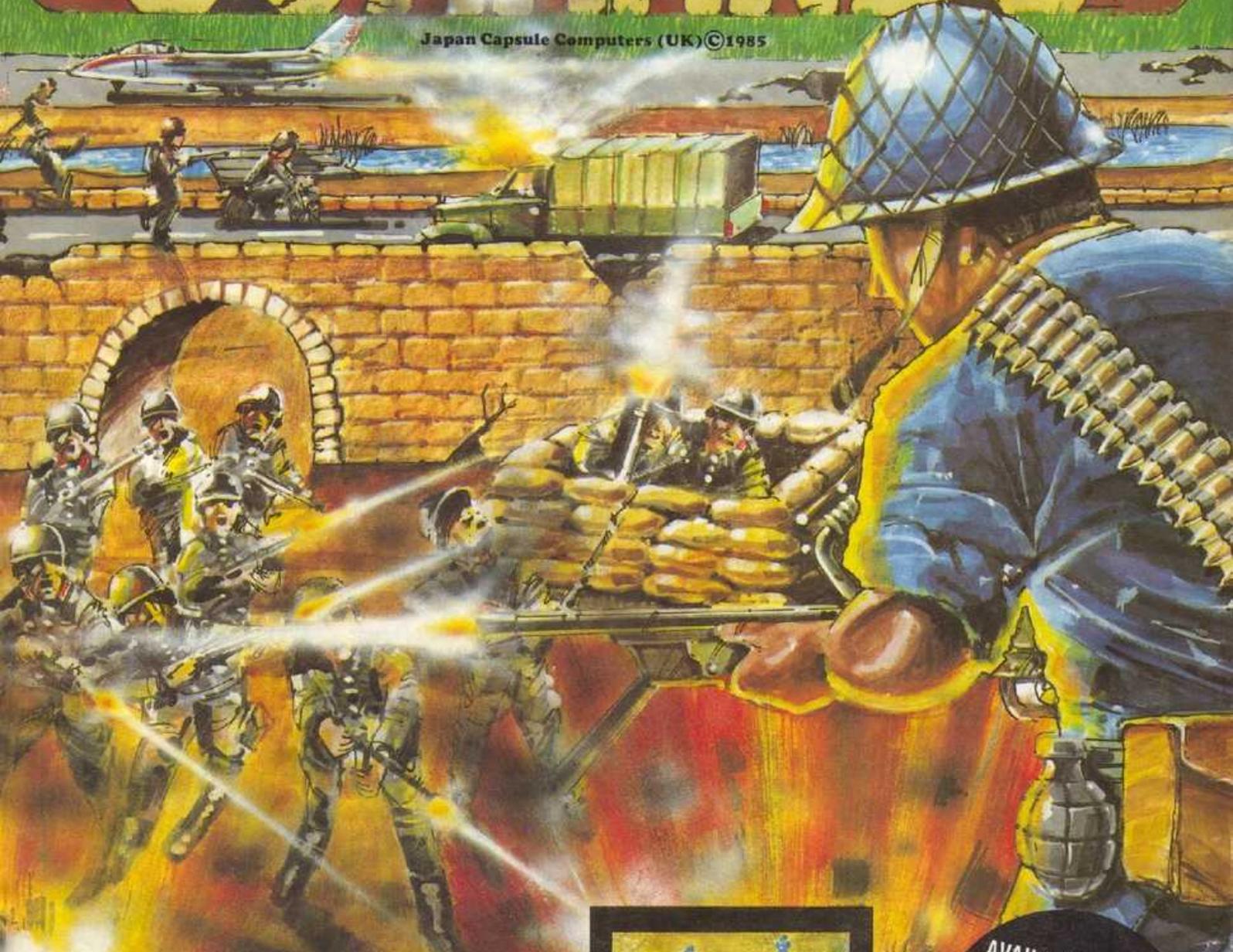


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EDITORIAL

Following the debate concerning the introduction of the Lenslok anti-piracy device on a number of prestige software products this autumn it was very encouraging to hear from Firebird that some of the expected savings are to be passed on to the software buyers themselves.

The reason Firebird's move to pass on some of the saving will be particularly welcomed is that - almost without anyone noticing - software prices have crept up over the last 18 months by almost a 100 per cent.

Remember Imagine when it first started? It was noted for its one-price policy: all its titles were £5.80. Then it became reasonable to charge higher prices depending on machine; the higher the cost of the hardware - and by association the better off the owner - the more

it was acceptable to charge. So C64 software cost more than Spectrum titles, and BBC software beat the lot.

Then, first Ultimate and then Ocean/US Gold settled on the magical figure of £9.95. Since then most other software houses have followed suit and a shade under £10 is now the norm.

Yet, £10 is an awful lot to spend on a single program. How many young people can afford to fork out that kind of money once a week? Very few. And the deterrent of price alone could itself be a powerful reason to copy.

Software houses may be pricing themselves out of their livelihood.

Entertainment software prices should be pegged at roughly the same as a music cassette or record - around £6-7, because that is their perceived worth.

Editor David Kelly News editor Christina Erskine Features editor Graham Taylor Software editor John Cook Production editor Lynne Constable Editorial secretary Lucinda Lee Advertisement manager Jeff Raggett Advertisement Executive Diane Holyoak Classified executive David Osen Administration Geraldine Smyth Managing editor Duncan Scot Publishing director Jenny Ireland. Published by Sunshine Publications Ltd, 12-13 Little Newport Street, London WC2H 7PP. Tel 01-437 4343 Telex 296275 Typeset by Publishers Reprographics Services Ltd, 4 Roger Street, London WC1. Printed by Greenaway Harrison, Sutton Road, Southend-on-sea, Essex. Distributed by SM Distribution, London SW9, Tel 01-274 8611, Telex 281643 © Sunshine Publications Ltd 1985.



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'Having worked a lot with the Amstrad, I have found the Enterprise's 256 colours and their versatile use to be a big advantage
- Ed Hickman, Mastertronic programmer

Sinclair turns in £18.3m loss

SINCLAIR Research's financial results announced late last week show clearly the reason the company hit financial trouble during the summer.

The figures show the company made an £18.3m pre-tax loss for the year ending March 31 1985. This compares with a £14.2m profit for the previous year.

The gloomy picture results from Sinclair having to drastically reduce the estimated worth of high stocks of Spectrum and QL machines held by the company. In total Sinclair wrote down the estimated value of micros held by £22.7m.

Since March the company has taken steps to reduce its high stock levels, first through its £10m Spectrum Plus deal with Dixons, then with a dramatic price cut on the QL from £399.99 down to £199.99.

Despite the loss, however, Sinclair's turn-over continues to rise, as it has done since the company's inception. Turn-



over to March 31 rose to £102.8m from the previous year's £77.7m. Exports were also up; they now comprise 40% of Sinclair's sales as compared to 32%.

Sir Clive Sinclair said that profits were sharply hit by the lack of business in the final quarter (the first quarter of 1985) and the need to revalue stock downwards. He also said that the substantial provisions made by the company at the nine-month stage (at the end of 1984) proved subsequently to be inadequate in the light of the virtual cessation of deliveries to retailers in the first quarter of 1985.

Program hitch for C128

IT WOULD seem that the new Commodore C128 micro is not completely software compatible with all Commodore 64 programs.

Although Commodore has advertised the C128 as being completely software compatible with the C64 in C64 Mode, it appears that some minor changes have been made to the display chip which are causing problems with a few titles.

"There are two additional

Amstrad PC

◀ continued from page 1

processor. Amstrad is expected to launch its IBM compatible micro next month - around the time that Commodore delivers its rival Amiga micro.

An Amstrad spokeswoman commented, "We have no plans for the near future to bring out any other pieces of computer equipment."

registers at the end of the video chip," explained Commodore UK programmer Mark Palmer. "These were normally invisible in C64 mode, but some programs may have written over them, although they should not have. The only other problem we've come across is with some fast loaders."

One game that has been causing problems is *Frankie Goes to Hollywood*, published by Ocean and written by Denton Designs. A spokesman for Denton Designs said, "This sounds like a problem with the loader rather than the game - since as far as I know there is nothing in there that would stop the game from running normally."

Mark Palmer advised anyone having trouble running C64 games on their C128 to contact the software company first, in case an up-dated version has been prepared.

Infocom's adventures out on CP/M

INFOCOM'S highly acclaimed adventures, including *The Hitchhiker's Guide to the Galaxy*, will soon be available on a much wider range of machines following UK publisher Softsel's decision to convert them to run under the CP/M operating system.

Apart from *Hitchhiker's Guide*, *Zork I*, *Seastalker*, *Planetfall* and *Deadline* are also to be converted. Prices have also been reduced. *Hitchhiker's Guide* will now cost £24.95 and the others £19.95.

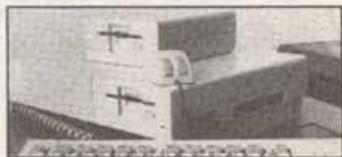
"I am certain of a huge response from users of machine like the Amstrad, BBC and Einstein," said Peter Scatchard, Softsel's marketing manager.

The conversions should be available within the next two weeks.

Sub-£1,000 Amiga?

COMMODORE'S Amiga micro, due for launch in this country at January's *Which computer? Show* (see *Popular* November 28), may yet be priced at under £1,000 for the basic model.

Commodore is apparently striving to price the Amiga, without the high resolution monitor, at between £800 and £1,000. The US price for the basic machine is \$1295, which



converts directly to £877, at current exchange rates. The version with the monitor costs around \$1900 (£1287).

Commodore itself would only say, however, that a price has yet to be fixed.

Fraud squad goes in at Medic

MEDIC Datasystems, the company which widely advertised QL peripherals such as a disc drive and a memory expansion pack, has been brought to the attention of Hampshire's Fraud Squad, apparently for non-delivery of mail-order goods.

Hampshire police were first contacted by two women apparently running the company after its head, Christer Skoglund, had gone to Ireland, two months ago. The women said they were unable to get in touch with Skoglund, and had found themselves

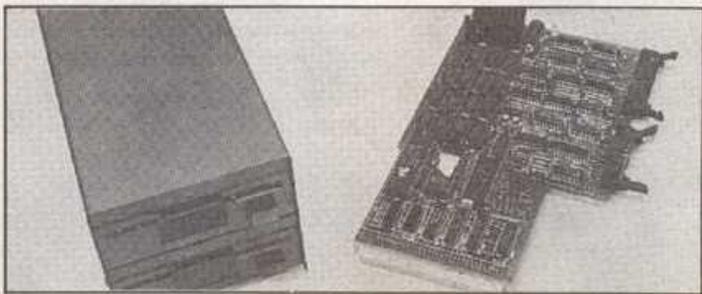
locked out of the company premises after non-payment of rent.

The Fraud Squad is now looking through all Medic's paperwork, which includes orders, cheques and letters complaining of non-delivery of goods. "It is not an investigation as such," said a member of the Fraud Squad. "We won't know if the company has acted fraudulently until we have been through all the papers."

Medic's bank account has been frozen by one creditor and a winding-up order placed on the company by another.

"I would not advise anyone to order goods from the Medic at all," the Fraud Squad spokeswoman added.

Anyone who has ordered and not received goods from Medic should contact Sgt Young, Hampshire Constabulary, Orchard Lane, Alton, Hants (0420 82244).



Rings released

TOLKIEN'S *Lord of the Rings* trilogy is being published in three parts by Melbourne House. Part I released this week is based on the first book, *The Fellowship of the Ring*. The next two books, *The Two Towers* and *The Return of the King*, and their associated games are to be released next year.

At £15.95, the first game includes three adventures and a copy of the book, *The Fellowship of the Ring*. Two of the games are full scale text and graphic adventures, while the third is a 'beginner's' adventure, designed to help adventure novices and Tolkien non-afficionados be-

come acquainted with the nature of the full games.

The parser used in the



Apricot profits drop

APRICOT Computers, formerly known as ACT, has run into problems. The company's profits dropped from £3.8m in the first half of 1984 to £1.27m in the first half of

this year. Added to this is a £5.1m write-down of stock, due to disappointing sales of its portable machine, leaving the company with a £4.6m loss. Apricot has also announced 120 redundancies, about 100 from UK staff and a further 20 in West Germany.

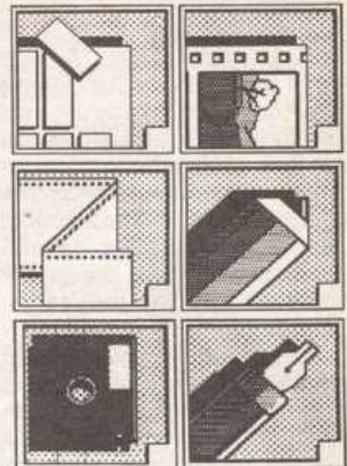
game allows much interaction between characters, and enables the player to take the part of one of four people: Frodo, Sam, Pippin or Merry. It has a vocabulary of 800 words.

Commodore, Amstrad and BBC version are all expected before Christmas at the same price, although there will be no graphics with the BBC version.

Fleet Street goes home

MIRRORSOFT has launched *Fleet Street Editor* a page layout/newsletter creation program for the BBC.

The company intends to publish *Fleet Street Editor* eventually in a number of forms. Level One includes versions for BBC, Amstrad CPCs and Commodore 128, which Mirrorsoft calls the everyday level. These versions enable users to create text in a number of fonts, select graphics to illustrate it, and arrange it on an A4 sheet, then print it out.



Level Two will be based on MSDOS, and thus run-on Apricots and IBM compatible machines. This will accept more sophisticated input and output and will directly interface with a phototypesetting system.

Level Three is designed for 68000-based machines, specifically the Amiga and Arari 520T, and will be a full photo-composition workstation.

The first *Fleet Street Editor*, the BBC version, will be released in January at a price of £39.95.

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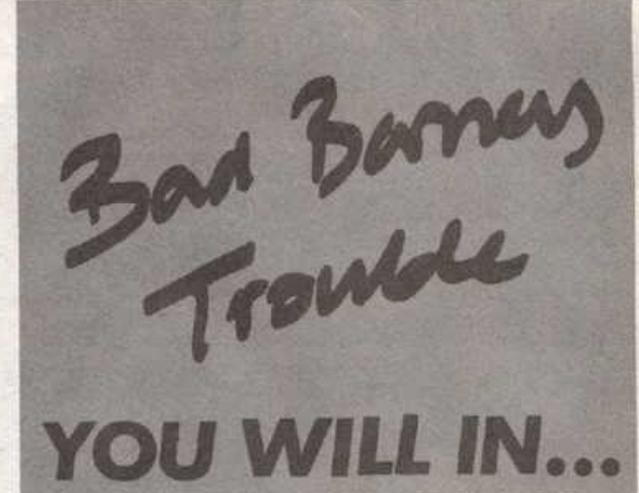
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Letters

Out of reach

Can anybody out there help me?

I have an Amstrad 6128 and a Juki 6000 printer. Everything works fine, *Tip-Ex* is a thing of the past. The secret of the microelectronic revolution is not that the things are clever but that they're so cheap.

There is however a snag: the Amstrad will only send a seven-bit character code to the printer and there is a proper pound sign and several other useful things of reach on the daisy wheel.

Does anybody make a gizmo that sets the eighth bit to the printer when sent a code (say ESC + >) and then resets it for the next character?

I know other people who have trouble getting characters with codes above 127 to their printers and some of them have gear twice as smart as mine.

Does the fix exist?

Peter Ceresole
14 Medcroft Gardens
London SW14

A cult micro

Your assertion, that the Spectrum is not a good computer, is without foundation.

Most of the micros in your survey were sawn-off business machines, sporting tiny Basics. The exceptions were the QL, Enterprise and the Spectrum.

The major ingredient of benchmarks are *For-Next* loops and, as even the Americans (who invented Basic) now agree, the programmer should be able to:

- 1) jump out of a for-next loop.
- 2) alter the value of the loop counter.
- 3) depend on the value of the loop counter after the loop has finished.

The Spectrum allows all three. The BBC, for instance, allows none.

As a measure of a Basic's power, you should be able to use all the micro's memory with a single direct command or a simple program, eg, 1 *Gosub* 1. Garbage collection causes problems on micros like the Amstrads and the

BBC. The Spectrum simply never allows it to build up in the first place.

The Spectrum has the most efficient memory manager in the computer world.

Anyone who's learnt assembler (any chip) can instantly understand the flow of a Sinclair Basic program, and conversely, by the time the Spectrum owner has learnt Basic, s/he is half-way to learning machine-code.

Perhaps the Spectrum's greatest asset is that it is future-proof. It uses a single bank of 280 addressable memory (bank switching has no place in future chip use). Furthermore it has a fully documented Rom which teaches by example good assembler technique.

I program on a variety of micros but develop new ideas on the Spectrum.

It is a beginner's, all-purpose machine, which will remain a cult micro for all the right reasons.

Geoffrey Wearmouth
Stoke Newington
London N17



"How did Arthur Dent and Ford Prefect get into our business software, Pemberton?"

C64 changes

It was interesting to see an article by Tim Decker (September 19) concerning changes to the C64.

I have been doing something on similar lines but have extended it to the blowing of an Eprom containing the changes and the manufacture of an adaptor to convert the 28-pin Eprom to the 24 pins of the Rom it replaces.

If anyone wants to know more perhaps they could drop me an SAE..

Robin Harvey
30 Wimborne Close
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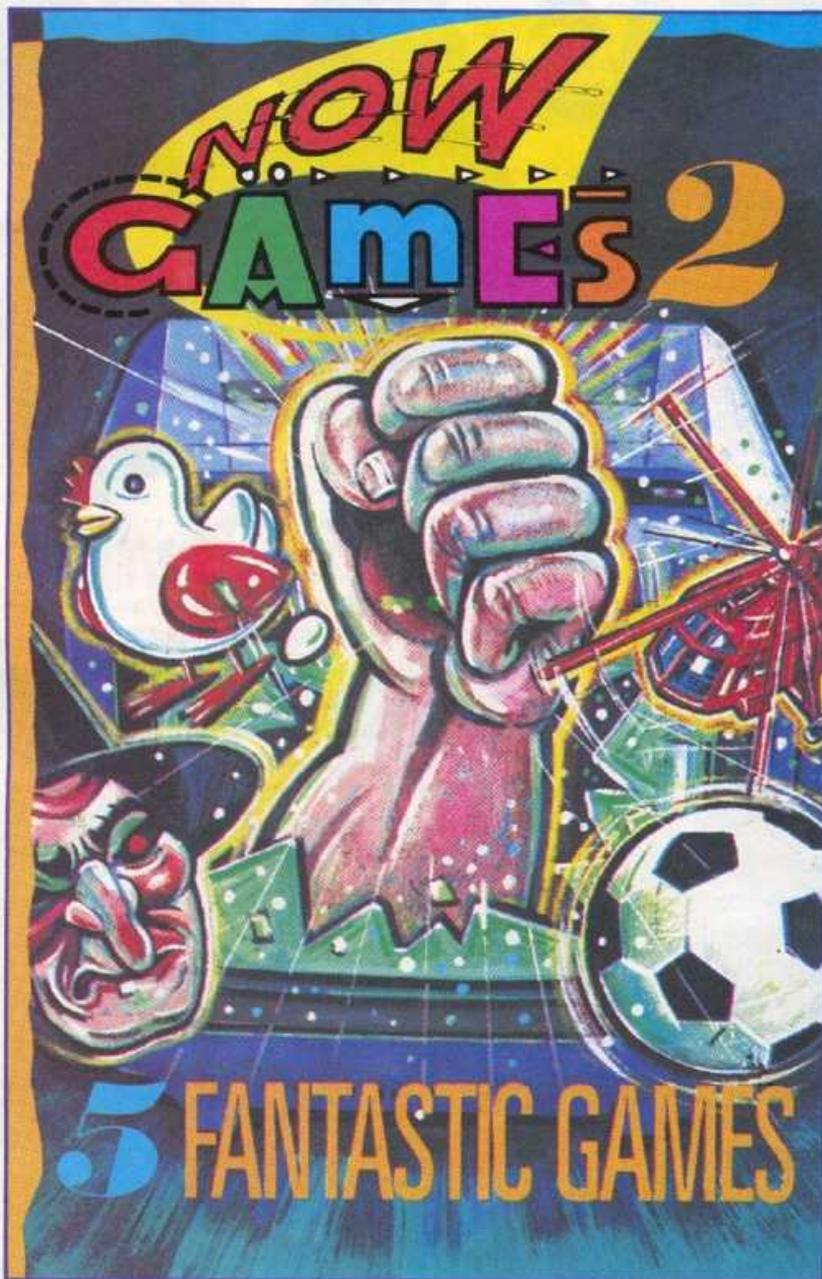
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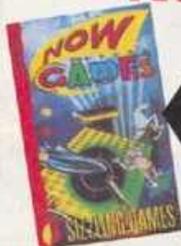


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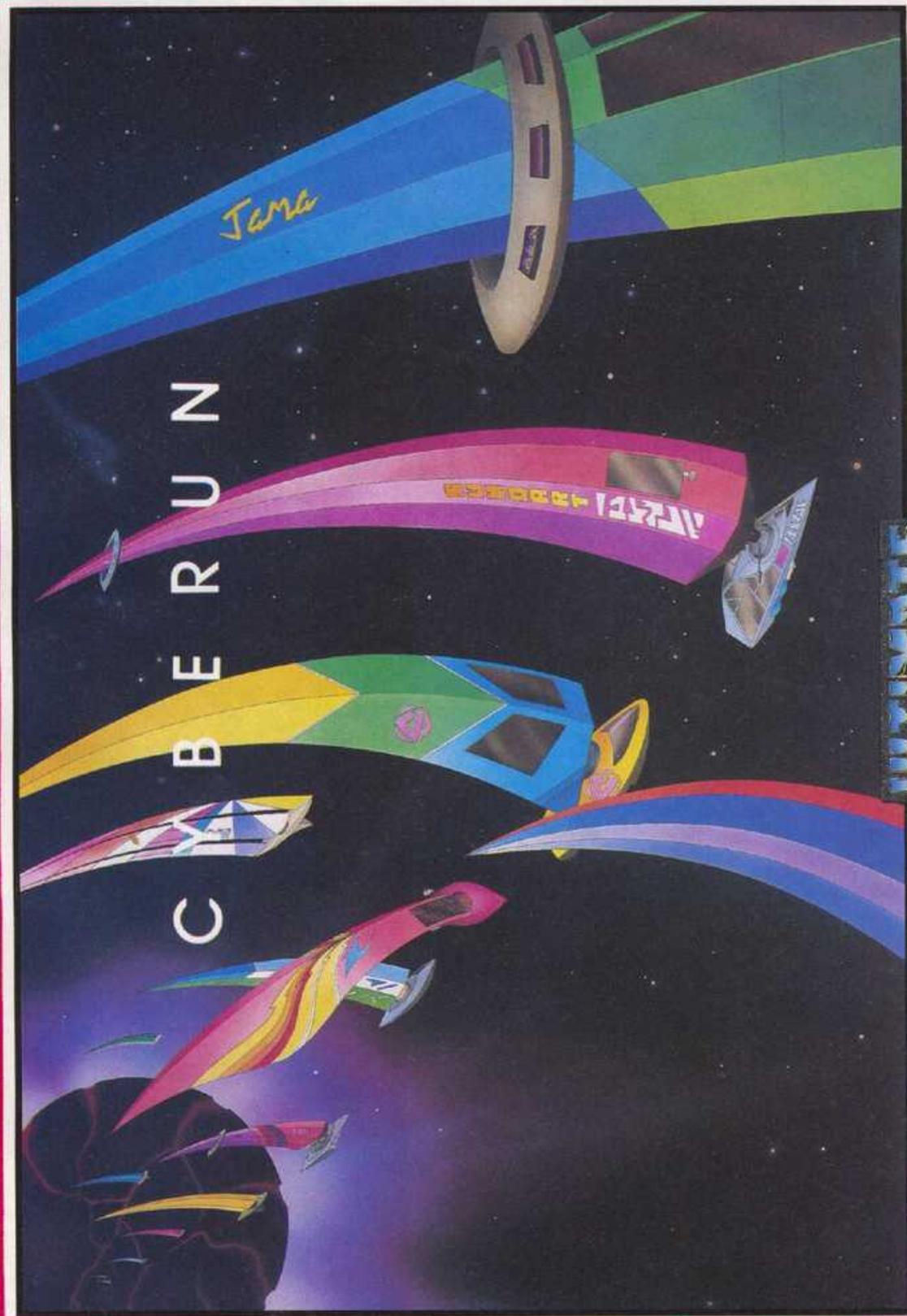
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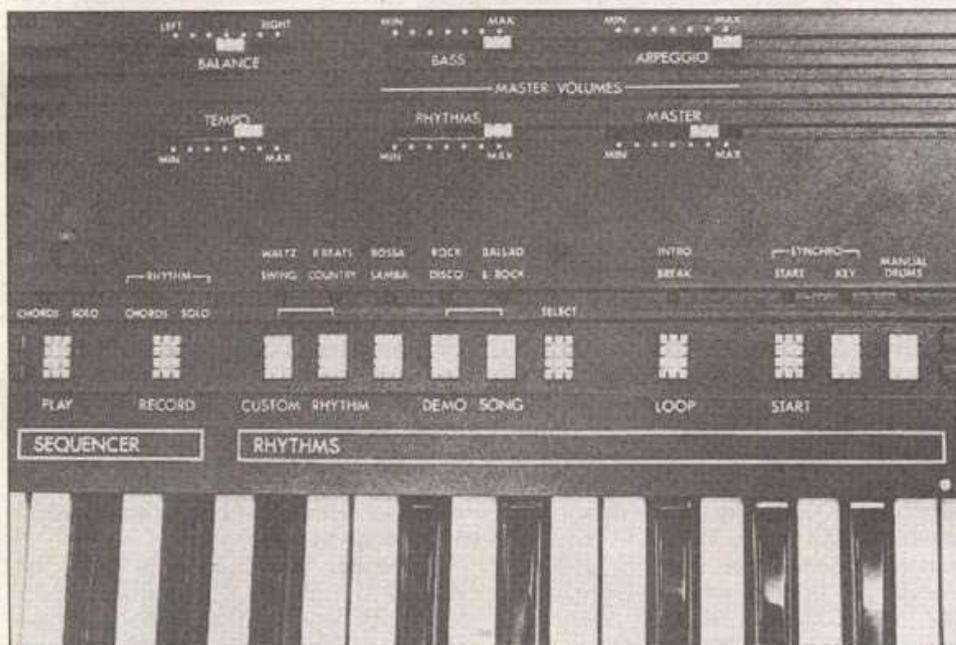
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TOMY

Beyond the blip

Graham Taylor looks at the new sound facilities



The noises your computer makes are becoming important. The casual blip to indicate variously, a key pressed, 'you can't do that', or 'the world has now exploded as a result of a cataclysmic atomic war', used to be enough for anyone.

Now everybody knows you beef up sales by a sizeable percentage by giving your product synthoflash multi-channel, get on down, fully-fledged music.

Real programmers don't care, of course, they occasionally moan on about such irrelevancies as music being custard on the meat of computer use, which is, of course, databases, accounts programs and number crunching as in 'let's just work out Pi to a few thousand places before lunch'.

Alan Sugar - well known computer aesthete and purist - is not, however, selling bundles and bundles of 6128s to real programmers, he's selling them to ordinary everyday people like you and I.

Music matters because a decent soundtrack on a game can give it meaning, drama and added excitement in exactly the same way that the soundtrack of a film functions. The first good example of this was *Ghostbusters* which, in its original Commodore 64 version, had a music track so good few reviewers spotted that the game wasn't really up to much - they didn't get past the funky opening credits.

Professional musicians now use micros via the Midi communications protocol to write, arrange and record - they give (in conjunction with all kinds of clever things that have happened in music technology recently) one lone keyboard player the opportunity to ma-

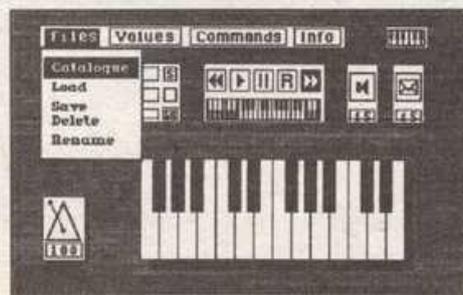
nipulate sounds limited only by the imagination and perseverance. You don't necessarily even need any music skills.

The hardware companies have hardly been oblivious to these developments and it's useful to look at some of the specifications for the newer machines and see how the musical facilities of the machines are changing and growing.

Sampling

A simple idea with fundamental effects. In the long run Sampling could effectively dispose the need for musicians - including orchestras - completely. It works by turning a 'real sound' like a trumpet into digital information which can then be manipulated in virtually any way you like and played back at any pitch using a keyboard.

Quite a few programs already feature sampling of a simple kind - mostly it's speech saying something like 'kkkeal the ernemych'. At some point a real person said 'kill the enemy' into a microphone a few thousand times and that information was converted using an analogue to digital device. The reason it doesn't sound too good is partly to do



with 'noise' when the original recording was made and partly to do with the rate of sampling. The higher the rate the more accurate will be the sample, but more memory will be used up.

There are some simple peripherals for home micros which let you try your own sampling and a number of listings have been printed in this and other magazines which convert sound information fed in via a tape port into a digital form - the end result still sounds like a badly tuned-in radio, though.

However, things are changing, mainly thanks to Commodore. The Commodore 64 is shortly to get a Sampler with various sampling rates, clever things like harmonising and flanging and is Midi compatible. That means you will be able to play the sampled sounds from the micro on any Midi-compatible music keyboard.

The Amiga, also from Commodore, due some time early next year, promises to be the first micro with sampling of a quality equal to that of dedicated music machines built-in.

Commodore are describing it as Fairlight compatible (the Fairlight is the Cray of sampling machines) though what that means seems uncertain. Whatever else, though, the Amiga has some superb facilities. Commodore has already shown some demos of samples of such things as drums and pianos, but the crowning glory was a powerful electric guitar sound. Seeing *Smoke on the Water* played on the Qwerty keyboard is a sight I shall never forget...

More important still, the Amiga has the memory and hardware (four analogue-to-digital convertors) to enable polyphonic sampling - that means chords.

Midi

Midi is a standard. An agreement between musical instrument manufacturers over electric standards which means that the keyboard of one machine can be used to play another or a drum machine can be synchronised with another manufacturer's synthesiser and so on. The important point for micro owners is that it is possible - indeed quite easy - to implement Midi on a micro.

A Midi equipped micro is, from a musician's point of view, a powerful tool. It means that the memory and programming facilities of the machine can manipulate the sounds of external Midi instruments. Thus a typical Midi software page might let you compose music on-screen, then manipulate that music in a variety of ways, somewhat like a wordprocessed document. The different music parts can then be assigned different Midi channels and played on a number of external instruments. It's really similar to the standard music packages you might find on a micro, but it lets you 'play' your music with real instruments.

The Atari ST has a Midi port as standard, but no software as yet to support it.

Micro Music Power

Even more interesting, the Spanish Spectrum 128 also has a Midi port and there is every reason to think the British version will have one too.



A Sinclair machine with Midi is an exciting prospect because it will bring this facility in as a standard on a low-cost micro and in so doing will encourage other manufacturers to follow suit. The Amiga does not have a Midi port as standard, but will have an add-on music keyboard, software and Midi package available shortly after its launch.

Synthesis

The average sound chip, found in say the Amstrad and BBC, is three channel. Each of those channels consists of an oscillator with a number wave forms and an envelope generator to define the shape of each sound (how quickly it starts and

stops). This has proved adequate for the average game, creating explosions, zaps and jangly little tunes whilst you're playing.

However, people are starting to want more. The Sid chip, found in the Commodore 64, has somewhat better facilities than the norm despite having only three channels. For one thing it has a filter which makes things a lot more interesting because it dramatically increases the range of sounds available; it can also synchronise sounds and do other clever things. The Sid chip is arguably the single feature that distinguishes Commodore 64 titles from those of other machines - they sound better. In fact, some recent programming of the Sid chip, notably by Ron Hubbard, has produced very impressive electro-disco music with wailing guitars and electronic drums.

The Sid chip is leading the way to considerably more powerful on-board chips. So far the only real example is Yamaha's CX5 which has eight-channel synthesis, based on the FM system Yamaha use in the now semi-legendary DX7. The CX5 has recently been reduced in price to £299 complete with mini keyboard.

The Amiga uses a special four-channel arrangement which can create sounds of astounding complexity. The reason is

that the concept of sampling extends to the creation of the waveforms themselves.

Thus instead of taking the sound information from an outside source (sampling) and representing it digitally, you can feed in the digital information directly and create the sound forms out of a string of numbers. These are then fed through the analogue to digital converters and output through the stereo channels as sound.

Commodore are bringing out an FM sound device as an add-on to the Commodore 64 which will give it eight voices and 16 preset sounds of high quality. Later software will allow you to edit those sounds and sequence them.

The important thing about all these developments is not, primarily, the scope the micro gives and will be giving to musicians. The important thing is what it will do for games, which, despite all grumbles to the contrary, still form the main reason that people buy and continue to use micros.

The Amiga, for example, is perfectly capable of running a complete music soundtrack using voices indistinguishable from 'real instruments'. Once you've tried a flight simulator with sampled 737 engine noises that respond to the power level, you'll find a three channel buzz pretty unexciting...

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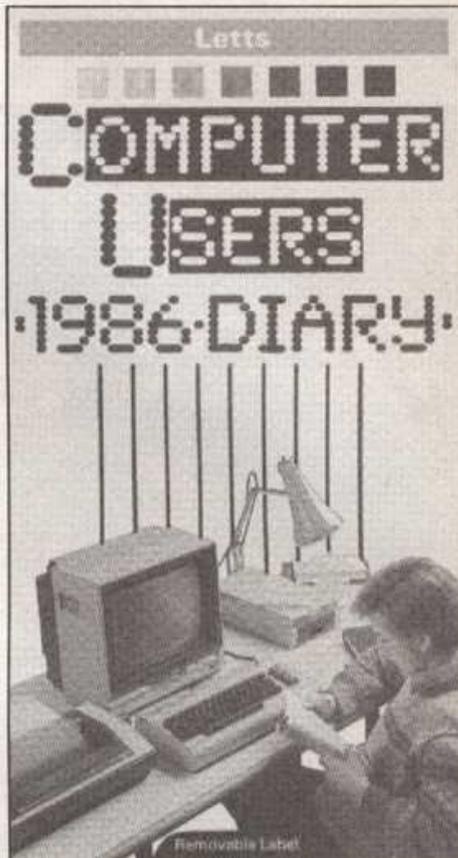
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Moving up to 16-bit

Christina Erskine talks to Tony (ex-Firebird) Rainbird

A lot of people were surprised at British Telecom's first foray into the computer software market - unassuming £2.50 budget games. Firebird's product seemed rather down-market given the high tech, go ahead, image BT was promoting at the time of its privatisation.

Yet going up-market was always planned and a month ago, Rainbird was launched. This completes a trinity of software divisions, following as it does, the acquisition of Beyond.

Rainbird is being launched and established by the eponymous Tony Rainbird, who was also a co-founder of Firebird. His brief is to produce sophisticated titles on more machines, leaving budget hits on 8-bit micros to Firebird. The new division currently numbers four staff; Tony, as operations manager, Mike Anderiesz as advertisement manager and Steve Porter and Tony Gibson, project managers.

Tony is particularly interested in developing programs for the 68000 processor based micros, such as the Apple Macintosh, Atari ST, Amiga and the QL.

"This means we'll be doing things

over a much longer time than Firebird - everything will be with a view to the future," he said.

At first sight Rainbird appears a risky, though exciting venture. After all, all the four machines named above have yet to prove themselves in this country; is it really a profitable project?

"Well, there's less risk than you might think: we want to concentrate on the processor rather than a specific machine, and of those four at least one will succeed.

"In fact, I'm expecting us to become profitable very soon because it simply isn't practical to concentrate only on developments for the future micros," he said cheerfully.

"Besides, our range is already wider than that. We have projects in progress for 8-bit micros too - the *Music System* and the *Advanced Music System* for the Commodore, and the *Art Studio* for the Spectrum. These are being converted to the Amstrad CPC micros, and the *Art Studio* also for the Commodore.

"On the adventure side, we will be releasing *The Pawn*, which is being written by Magnetic Scrolls, on the 68000 micros. Magnetic Scrolls is converting the parser used for the popular 8-bit machines as well.

"But our target for the 16-bit machines is still entertainment - we're not interested in spreadsheets and so on just yet. We will have a combination of adventure, simulation and strategy, and also what I can only really term 'megagames' - I can't think of a better word to describe them.

"For example, one project we have underway is *Reach For The Moon*.

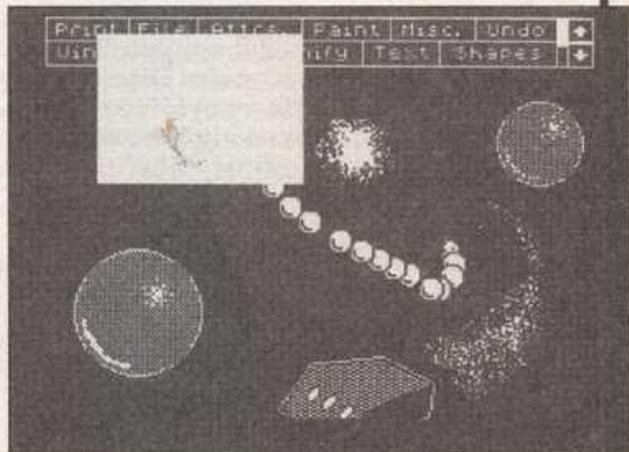
It contains an

icon driven 'decision maker', eight text and graphic adventures, and a vector graphic flight simulator, all in the one program."

Tony hopes that Rainbird will be able to release about one title each month in 1986.

Prices will inevitably be quite high, but according to Tony, "we'll price according to merit and, of course, the development costs."

In some respects, Firebird, Rainbird and Beyond will all be competing against each other with titles of a similar quality;



although New Information Services, the division of BT which holds all three, will ensure that the trio never, for example, bid against each other for the same licensing rights.

Rainbird will also work very closely with BT's newly set up software arm in the US, Firebird Licensees Inc.

"A good proportion of our product will be suitable for the American division, and a smaller proportion of that from Firebird and Beyond. The *Music System* is to be released over there, as is *Elite*."

Tony reckons a priority for the US is products for the Atari ST.

"They've sold between 50,000 and 60,000 over there, so it's going quite nicely. I reckon there'll be quite a few around in this country by next Christmas as well."

Plans are also afoot to export the other way - into Europe. The *Music System's* manual has been translated into German in readiness.

Rainbird is certainly a far cry from Tony's first micro venture. "I was a warehouse supervisor, writing games and setting up a label called Microgold in my spare time.

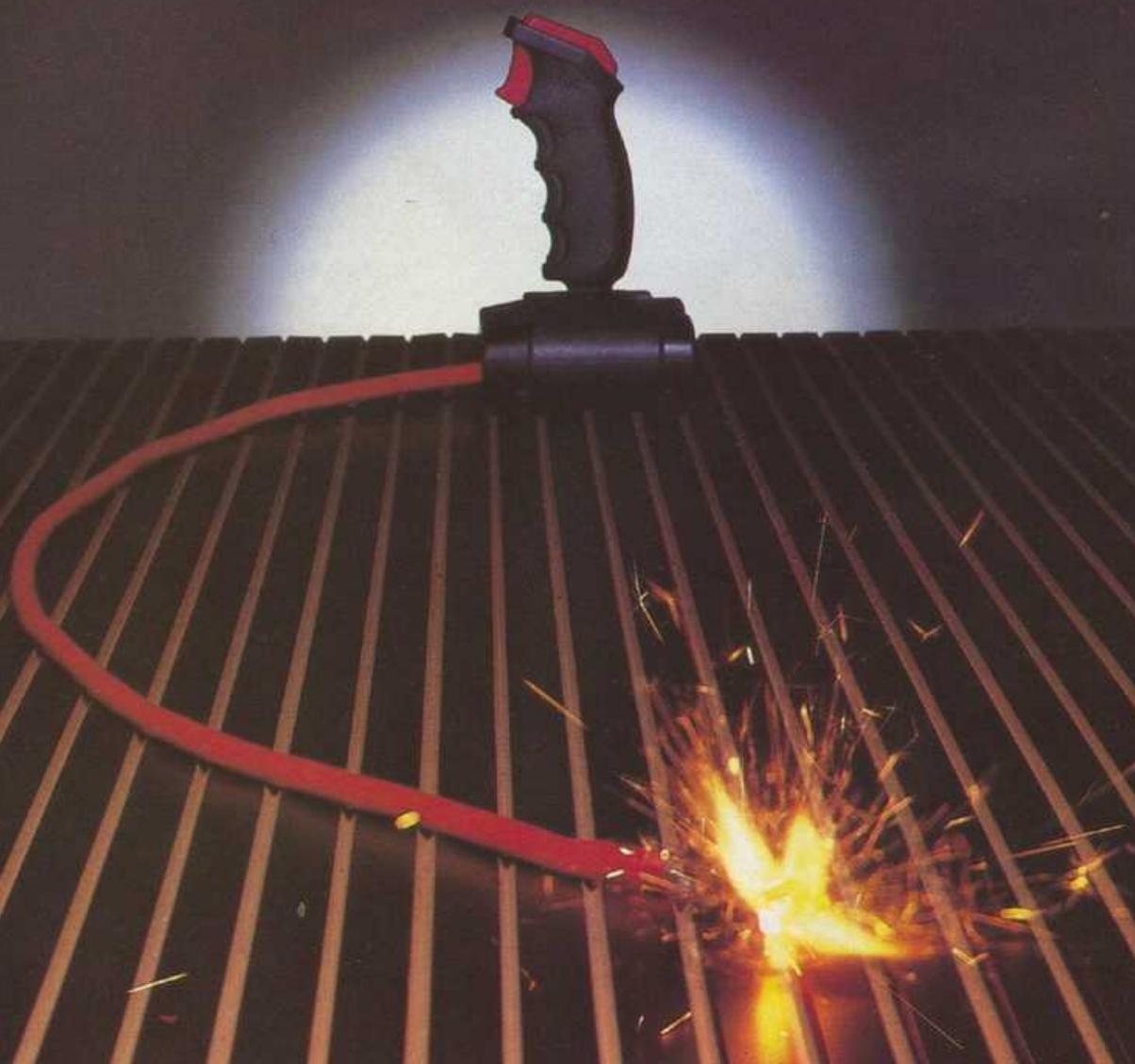
"There were five budget titles for the Vic 20, three of these games I'd written myself.

"The duplication, sticking the labels on cassettes, folding the inlay cards and selling directly to the shops was all done by me.

"Then British Telecom bought the product rights, I applied for a job to go with them, and ended up helping to launch Firebird."



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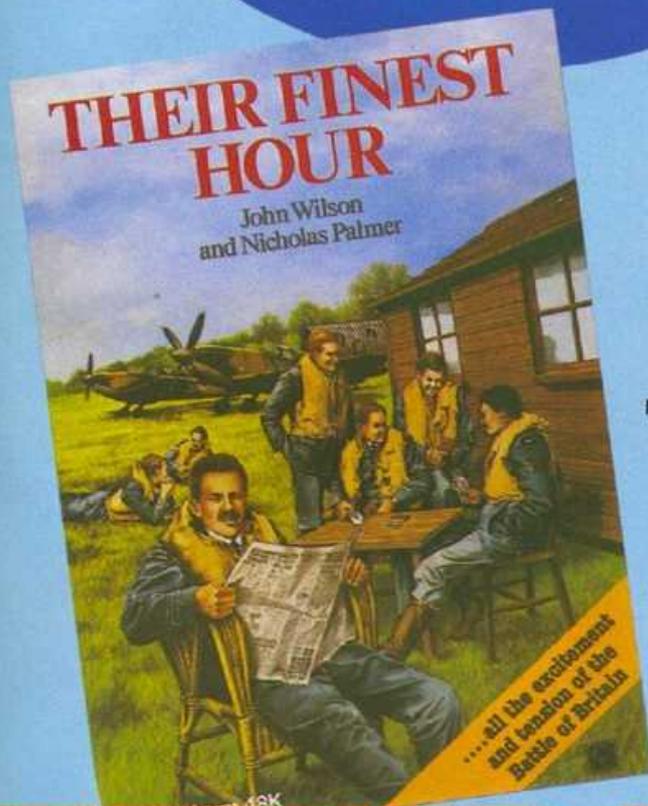
"What's that picture supposed to be?"

"Er, eye-catching, that's what it's supposed to be."

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"Well, er ..."

"Right, we'd better hurry up and design a new ad before the game hits the streets on 9 December, and people start writing to and phoning Century Communications at 62-65 Chandos Place, London WC2N 4NW, Tel: 01-240 3411 and asking for copies."



THEIR FINEST HOUR



Their Finest Hour — a great strategy game simulating The Battle of Britain, by Nicholas Palmer and John Wilson. Published by Century Communications for the 48K Spectrum at £9.95.

48K Spectrum

Reviews

Lukewarm

Program *Swords and Sorcery* Micro Spectrum 48K
Price £9.95 **Supplier** PPS, 452 Stoney Stanton Rd, Coventry CV6 5DG.

It's been a long time coming and not surprisingly we all hoped for something special.

Opinions differ wildly on the final results. One person I know would put it at the top of his Program of the Year list without any hesitation.

I belong to the other camp. While I admire the hard work in programming *Swords and Sorcery* - and the Midas operating system which drives it - my overall reaction is lukewarm.

Perhaps I expected too much but after 18 months of promises of micro role playing, I'm sad to find the reality



less like *Dungeons and Dragons* than I'd hoped. One immediate problem is the design of the enclosed dungeon, which is rich on rooms but low on atmosphere. The succession of chambers (each with its own monster, most of which have to be fought as they don't respond to the excellent Talk

option: 'Hello, Mr Snake' doesn't get you very far) is hardly inspiring and I'd question the importance of the 3D graphic when all they produce is bland line drawings that suggest nothing more than an NCP car park.

On the other hand the series of menus and sub-menus that guide all but

your movements take no time to learn and then work very smoothly. Even so, other aspects of the display can be confusing, and at times I was unsure just what was going on. Another aspect of role playing is maintaining the logic of the game and so I couldn't see why I was allowed a map of a quarter of the level with the positions of wandering monsters marked.

So, though the game gives you the ability to train your own character in various skills, I found myself unable to empathise with him and get into the spirit of the adventure.

Perhaps the Midas system will improve as better environments become available, but at the moment it lacks the human level of playing another character.

It is all too schematic.

John Minson



Numbers

Program *Supercalc 2* Micro Amstrad CPC 6128/PCW 8256 (CP/M+) **Price** £49.00 **Supplier** Amsoft, Brentwood House, 169 Kings Road, Brentwood, Essex CM14 4EF.

I must admit that I scoffed at the idea of providing CP/M on home computers. One of my principal doubts was that a vast proportion of the software available carried enormous

nies worldwide. Now for a lowly £49 you too can run the very same thing to keep track of your home budgeting. I'm still not entirely convinced that this means that owners of the 6128 should therefore ignore the best of the cheaper software such as *Mastercalc* but it is something to think about. Perhaps more importantly it makes the 8256 even

more viable as a real low-cost business system.

Unusually for a heavyweight CP/M release, it runs quite well on only one drive. Features offered include complex and very comprehensive formula options, the ability to merge several small sheets into one large one, a utility to convert files from another program into

Supercalc readably and vice versa, calendar functions, user-defined screen formats, windowing, text look-up tables (for details not shown on screen all the time) and the ability to 'hide' selected cells.

Take my word that it can't be faulted.

Tony Kendle



A yardstick

Program *Yie Ar Kung Fu* Micro BBC/Electron **Price** £8.95 **Supplier** Imagine, 6 Central Street, Manchester

Not too long ago Bruce Lee, complete with flying feet and fists, was king of the silver screen. But, like many crazes, the popularity of kung fu slowly faded. The micro revolution has stimulated new interest in this most noble way of beating your opponent senseless. One fine example of a kung fu program is *Yie Ar* from Imagine.

Your function in this game is to control the actions of the kung fu master Oolong. By using keyboard or joystick you can execute over a dozen combinations of jumps,

kicks and dodges.

Oolong's first opponent is a 20 stone tank named Bucha. A chest high head butt is one of this guy's favourite moves. The second opponent is rather more difficult to dispose of. In keeping with his name, Star, he launches a constant barrage of spiked missiles. Getting close to him is difficult, putting him down is even worse.

Nuncha is the third adversary, armed with two lengths of wood joined together by a chain. Once he gets that thing whirling your best bet is to keep your head down and go for the shins.

On level four your opponent is a little man with a big stick. This honourable gentleman is intent upon giving you indigestion. I reached level five and was stood waiting for my next opponent to appear when I was suddenly accost-

ed by a swarm of flying teapots. These "feedles" were my downfall every time, no matter how I tried I just couldn't kick sufficient of them to reach the next level.

The graphics are excellent, each character's movements being tailored to his own particular discipline. This combined with the wide variety of opponents will make *Yie Ar* the yardstick to which other



manufacturers' offerings will be compared.

Hannah Frances



price tags, explained away by the need for 'dealer support', etc, that surpassed the cost of the computers themselves. Now I have to eat my words, as Amstrad, and certain other dealers, have been remarkably successful in negotiating price cuts of important releases.

Supercalc 2 is probably one of the top five best known names in the business software world, used by compa-



Little person

Program *Little Computer Person Micro* Commodore 64 **Price** £14.95 **Supplier** Activision, 15 Horley House, London NW1.

Dear Friend,
I am going to be very busy in my new home, so please don't think I am being rude by ignoring you, it's just that there's so many things to play and do, they will take up all my time. Please remember to keep me fed and top up my water and I'll want for nothing else.

Love,

Maxwell."

Billed as Activision's biggie for Christmas, this was how my little computer person introduced himself and his dog to me, and after moving in and having a good look around, he got down to the real business of his life - that of playing games, talking to his friends on the telephone, dancing, playing the piano and exercising.

David (*Ghostbusters*) Crane who masterminded this concept says that each little person sold will have a different name and possess his/her own particular characteristics - shy, extrovert, musical, etc.

I must admit that he is start-

ing to bore the pants off me.

This is not a game, but an exercise in observation and however much Activision promote it as being a real live person inside your computer, it has the obvious limitation of memory and soon becomes repetitious in the extreme.

What you see on screen is a 2½ storey house with all the mod-cons, ie, TV, hi-fi, bedroom, kitchen, lounge etc, and after the initial 'moving in' sequence, which only happens the first time you load up, your little friend flutters around the house at random, ie, playing the piano which utilizes the 64's excellent sound system (and up to now I have heard five different tunes), dancing, listening to records, playing cards and typing letters to you which is his only means of communication to humans.

Using the keyboard, you can type in commands and ask him to do things which may or may not happen.

The attention to detail in the house is excellent, there is even a clock on the wall which keeps perfect time from the moment you type it in at the beginning of each session.

He will go to the toilet at regular intervals, conveniently shutting the door first

and flushing of course, and makes himself meals, washes up and even cleans his teeth afterwards - a nice touch.

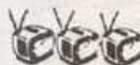
Playing cards with him is a bit of a let down, you get two choices of game, poker or card war, and a game of anagrams is thrown in as well, but this is not new and the card information in fact replaces the top half of the house which is quite disappointing.

My five year old daughter instantly fell in love with Max and happily played with him for a couple of hours until she lost interest with watching him go through the same sequences again and again.

Concept - totally new; presentation - brilliant; graphics and animation - superb; sound - excellent; but lasting interest? - no way. What Activision needs to do, if it's possible, is use this as a base module and introduce additional programs to it, giving your man a friend to live with or change the scenery maybe.

As it is, I'm afraid poor Max will be left to live in my daughter's bottom drawer.

Andy Moss



Boiling point

Program *Chemical Formulae Micro* Spectrum **Price** £9.95 **Supplier** Eclipse Software, 79 Ardrossan Gardens, Worcester Park, Surrey KT4 7AX.

I don't know about you but drawing up equations was the bane of 0-level chemistry for me. All that time spent looking things up in the Periodic Table, then trying to make things balance. And I usually got it wrong.

Now Eclipse has produced a program that contains a database of elements and ions, which will produce information on formulae, valencies, structures, atomic numbers, and melting and boiling points; more importantly it will calculate formulae, so if you want to know the low down on Potassium Cyanide, just type it in.

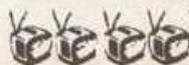
It's mainly menu driven and despite being written in Basic works quickly enough. You have to be accurate within certain parameters when naming the elements and ions, but these are quite clearly spelled out in the instruction booklet, which also provides a brief introduction to the topic.

While hardly glossy in presentation, it is serviceable and along with the rather high price this can be excused by the program's specialist nature.

The Basic is unprotected but it's easy to rescue if inadvertently crashed.

There's little more to say. If you need such a program and don't balk at the price this should suit, despite a general lack of chrome. It's also good to see the Spectrum used for something other than alien bashing.

John Minson



Go ape

Program *The Evolution Micro* Spectrum **Price** £6.95 **Supplier** Ernieware, Postbus 2353, 6201 DB Maastricht, The Netherlands.

I don't know about that much heralded/be-moaned American invasion but nowadays there's a fair amount of continental software around, what with French pinball machines and Spanish boxers. Now it's Holland's chance to get in on the act and Ernieware tells us that *The Evolution* will be available over here before Christmas.

Despite its missing link cover and instructions full of talk of 'acts', this turns out to be none other than that old - and I do mean old - friend, the computerised cube. A six by four grid of numbers is 'rotated' until the original or-

der is totally scrambled. You have to shift the rows and columns back again. Complete this within a certain number of moves and time limit and you move on to the next stage or 'act'. Difficulty levels are defined by limitations on which way the columns can move and at their hardest these make a complex task totally frustrating.

The game itself is fine if you like that sort of thing and while those of a coolly logical mind will sail through it, others will end up tearing their hair. But no way is it going to scare the producers of the big Christmas games and at the proposed price it's far too expensive for this sort of game. One can only presume that the Dutch software industry isn't so well developed as some of its European counterparts.

John Minson



F.A.B.

Program *Thunderbirds Micro Spectrum* Price £3.95
Supplier Firebird Software, Wellington House, Upper St Martin's Lane, London WC1.

Cue an excellent rendition of the Thunderbirds March.

"Scott. Virgil. An emergen-

cy. A team of archaeologists have crept into a crypt and gotten themselves trapped."

"Serves 'em right."

"You'll need Thunderbirds One and Two."

"Aww, no - I was gonna take TB One drag racing today."

"There's money in it. The catacombs are alive with treasure."

"And monsters too. Betcha."

"Okay, there may be the

odd monster. But you can equip Thunderbird Two from the whole range of tools before you go. . . . at cost plus 25%."

"How about a pair of scissors to cut the monsters' strings?"

"Now these caverns from a giant maze. . . ."

"Bor-ring!"

"Not so. Some passages are only of a size to take one craft or another, which means you'll need to co-operate."

"I'm not co-operating with him, after last time."

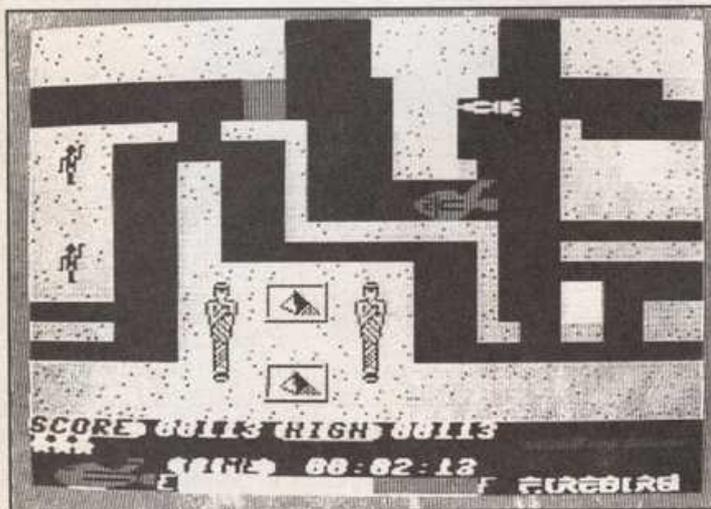
"Well, you'll have to, to clear passages by shifting blocks, most of which only one craft can do. Then there are sections with specific problems. It really takes thought."

"That rules out ole' wood-head here."

"It's really more of an abstract problem."

If you like abstract strategies then you'll probably love it.

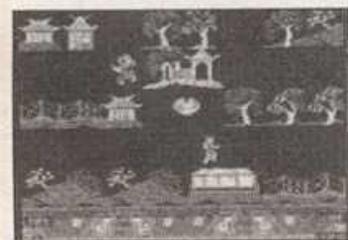
John Minson



Patterns

Program *Willow Pattern Micro Amstrad* Price £3.95
Supplier Firebird Software, Wellington House, Upper St Martin's Lane, London WC2.

Yes Grasshopper - san, it is time for you once again to defeat the forces of wickedness in the guise of Ta Jin, a wicked merchant who plans to marry



Princess Koong Shee. You enter the Mandarins' Palace, defeat his sword throwing Samurai and rescue her.

So begins the *Willow Pattern* - a pretty maze game from Firebird's budget range. Although a bit lacking on actual game play, the program makes good use of the Amstrad's colour and con-

tains some pleasant water music to accompany the action (all water music grates after a while and this is no exception).

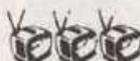
Still, what about the game - it's the usual maze variety with a number of nicely animated guards who throw swords at you if you venture too near, but pass them, wait till they throw the knife, dodge it, pick it up and throw

it back at them.

Once the princess is rescued you have to run back through the maze and on to a boat whilst being pursued by the enraged merchant.

Not as good as some of the other silver range, but, nevertheless a pretty good Japanese take away.

Andy Moss



Rrum rrum

Program *Revs Micro Commodore 64* Price £14.95 (tape) £17.95 (disc)
Supplier Firebird Wellington House, Upper St. Martin's Lane, London WC2H 9DL

Whenever I hear people moan about the standard of BBC B software, I point them in the direction of that now classic from Acornsoft, *Revs*.

They invariably come back delighted or disappointed depending on what machine they own.

Now *Revs* has been converted to the Commodore 64,

marketed by those bastions of private enterprise, Firebird.

The 64 version is completely faithful to the original in layout and design, and at times you'd be hard pressed to guess which machine it was running on. Admittedly, there are slight differences. . . . the corners seem a touch more angular compared to the original, and the striped kerbs at the side of the track don't zoom by quite so fast, which for me removed a little bit of the drama and atmosphere. But nit picking apart, the gameplay is virtually identical. . . . and you get two tracks, Silverstone plus Brands Hatch.

A nice touch allows the use of the Commodore games

Spelling test

Program *Tas-spell Micro Any Amstrad* Price £16.50
Supplier Tasman Software, Springfield House, Hyde Terrace, Leeds LS2 9LN.

As a naked word processor, *Tasword/Amstrad* has recently received some extremely stiff competition with the release of Arnor's *Protex*. However, the disc versions of *Tasword* are still the best value all-round package for the Amstrad range with mail merge facilities, the *Tasprint* text-redefiner program, and now *Tas-spell*.

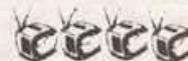
Tas-spell is self evidently a spelling checker and it is only accessible via a menu option of the disc releases of *Tasword* itself, it is not a 'stand alone' package. The program contains a disc with a dictionary of over two thousand words, all with the English spelling and 45K free for you to add ones of your own.

It is extremely simple to use, reading through the text currently held in memory comparing it with the dictionary data. Unrecognised words are highlighted, in context, and you are given options to *Ignore* the word, or *Change* the word that you habitually mis-spell.

An irritating feature is that it constantly throws up names, initials, etc. You would be well advised to add your name and address to the dictionary. Also it makes contextual mistakes such as 'its over their' but that is a flaw with all spell checkers and no reflection on *Tasword*.

On the whole, though, it is an essential utility for anyone who has to produce important and correctly spelt documents.

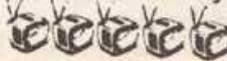
Tony Kendle



paddle as a 'steering wheel' if desired. . . . good thinking by somebody.

The most challenging and addictive game to hit the Commodore for quite some time. You'll love it.

John Cook



MS-2000 Mouse

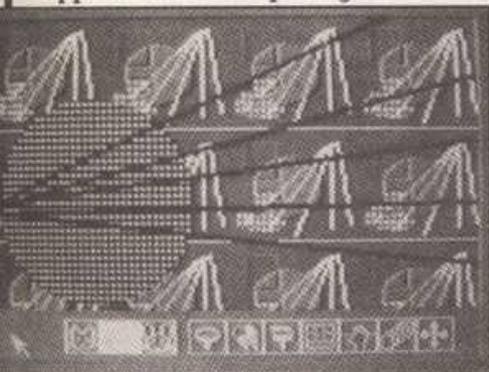
Hardware MS-2000 Mouse Micro CBM 64 Price £69.90 Supplier Wigmore House, 32 Savile Row, London W1X 1AG.

As mouse/icon/window systems become more popular, no doubt prompted by the success of the Apple Macintosh's operating system, more and more micro owners will discover the joys of using these user-friendly devices. The MS-2000, based on a product for the BBC-B, is by far the best such package for the CBM 64 so far.

The MS-2000 is comfortably small, wedge shaped, and has two oblong click switches on its nose. It connects to the 64's joystick port by a standard 9-pin D-plug. Beneath the mouse is the non-slip rubber ball, and inside, the opto-electric circuitry which gives a movement resolution of 100 points to the inch.

Like all mouse systems, the MS-2000 works by being rolled over a flat table surface, and moves a control symbol over a selection of command icons on the screen.

In the case of the MS-2000, the software supplied with the package is called



Line, Circle, Square and Fill routines

Cheese. It's a hi-res design program which enables you to utilise the powerful graphics abilities of the 64 without recourse to the awful CBM Basic.

On loading the software from cassette, you are presented with a blank screen with a selection of icons at the bottom. Rolling the mouse around moves a pencil-shaped cursor over the design area. This cursor changes to an arrow shape when it passes over the command icons. A numerical readout on the bottom left of the screen gives you the cursor's precise location, making exact positioning easy.

To select a function, you merely place the cursor over the desired icon, click the right-hand mouse button, and move the cursor to the drawing screen. I must say that the software is brilliantly programmed: all the graphics facilities are fast, smooth and precise. There are three lots of icons to select from, the two hidden pages are brought up by clicking on the mouse icon.

Graphics facilities include freehand

draw, which is very fast and responsive; dotted line draw; straight line draw, which allows you to set a point, extend a line from it and click the button again to draw the line; a very fast circle/ellipse facility, open or filled; equally good square/rectangle drawing; paint, a very fast and efficient fill routine; three selectable "pencil" thicknesses; an excellent "airbrush", which allows you to "spray" large areas, either in solid colour or in any one of a selection of 32 patterns.

You have a choice of all 16 colours for the cursor or paint, (unlike some packages, such as the Datex Mouse, which limit you to two colours on the screen at any time). Your current drawing colour is indicated by the border colour.

Should you make a mistake at any time - for instance, allowing a fill routine to leak all over the screen by leaving a box open - you can delete the last action by clicking on the "Cat" icon.

Having drawn your basic design or pattern, there are various high-level options to modify it. You can define a box and copy the contents all over the screen; set up a line of symmetry so that patterns reflect in the horizontal, vertical, or diagonal axis, or any combination; you can change the background colour; scroll the drawing area to get at extra space; zoom in on a small area to make corrections to individual pixels;



Free-hand Draw, Pencil and Airbrush

print your design out in black-and-white on an MPS printer; and save it to cassette.

If it isn't already obvious from the description of the facilities, I must say that I found the MS-2000 wonderful to use; the hardware is excellent, the soft-



ware technically stunning and well-thought out, and the graphic effects you can achieve, even if you have no real drawing skill, are extremely impressive.

Three minor quibbles, two of which should be dealt with by forthcoming software releases from Wigmore House. Firstly, given the notorious slowness of Commodore cassettes, a disc option would have been nice; apparently both disc and Rom versions of the software are on the way.

Secondly, the lack of any text input option makes the *Cheese* software more suitable for pure graphic design, rather than for applications such as drawing bar charts or circuit diagrams. Forthcoming software will allow you to use a number of text fonts in your designs. There are also hints of other, more general, Windows/Icons/Mouse software to come.

Thirdly, unlike some packages such as Koala Pad, it's not possible to remove the icon menu from the screen to leave the bare graphics. However, this is a minor point since the menu takes up very little space.

The MS-2000 package, which comes with a helpful, clear manual, is certainly one of my favourite 64-compatible products ever.

As a bonus, powering up the micro with the mouse's left hand button held down allows you to use the MS-2000 as a "joystick".

If you can possibly scrape the money together, do so - letting your creativity flow through the mouse is much more satisfying than zapping any number of aliens.

Chris Jenkins

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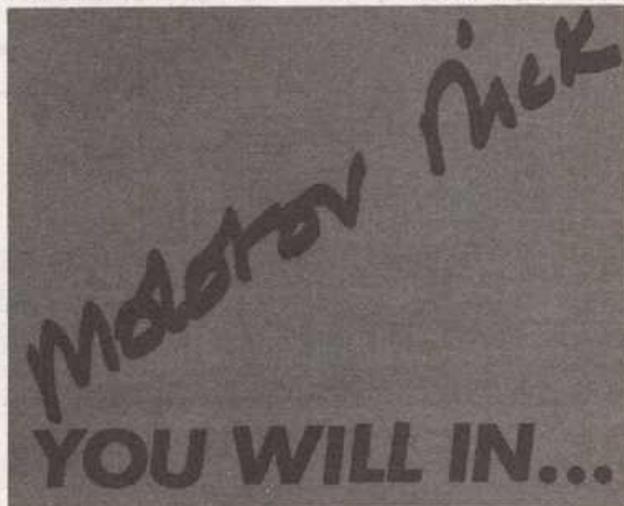
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Data Protection

by Jonathan Darks

escape if it contains such information as occupation, home telephone number, date of birth, etc.

All right, most impressive, but what relevance does it have to the home computer user? In my own case using a computer to record patient details, the need for confidentiality are obvious, but what about the enthusiast who keeps a membership/ mailing list for the local squash club or amateur dramatic society? Not very exciting information perhaps but it will probably contain at least a name and address, home, and perhaps work telephone numbers (and therefore a clue to occupation), and maybe even a date of birth. There are very few exemptions to registration. Quote: Personal data held by an individual and "concerned only with the management of his personal, family or household affairs or held by him only for recreational purposes". Such users are unconditionally exempt from registration.

Examples of conditional exemption include. Quote: "data held by unincorporated members clubs relating only to club members" and "data held for distribution of articles or information to the data subjects and consisting only of their names and addresses". Note, these last two are examples of conditional exemption. The data subjects concerned must be consulted as to whether they object to the information being kept and must be consulted before any data is disclosed.

How then best to protect the data and, of course, yourself? Basic security is fairly obvi-

ous, don't leave discs or tapes lying around and, proud as you may be of your latest all singing and mail-merging database, be careful who you demonstrate it to! Remember also that computer generated material is just as important so tear up those yards of printout before you chuck them in the wastepaper bin. Finally, to make sure you are not the subject of that fascinating test case that's bound to occur before long, you can obtain full details of the act in (it is claimed) simplified form, for free, from: The Data Protection Registrar, Department 1, Springfield House, Water Lane, Wilmslow, Cheshire SK9 5AX.

Program

And now my own own small contribution to data protection. The following program, designed for use with a disc drive, will scramble ASCII text or program files, including Tasword files, and will cope with most files containing mixed numeric and string data produced by the Amstrad (not Masterfile files unfortunately, as these are in binary format). It accepts a code word of any length (letters only, these are converted to upper case for processing) and for the more paranoid this need not appear on screen. Then the ASCII value of each letter in turn is added to that of successive characters in the data file cycling repeatedly through the codeword until the whole file is scrambled. To unscramble the process is reversed. Written in Basic, the scrambling process takes a short while to complete, but any number of files can be selected for sequential processing.

The Data Protection Act is in the process of being implemented and in the next few months all large organisations using computers to store personal information about individuals will be required to register with the Data Protection Registrar . . . Right?

Wrong! Under the strict terms of the act, anyone holding such information should register, and anyone contravening the act may find themselves facing a fine of up to £2000, or in some cases an unlimited fine! There are very few exemptions to the act and even a simple mailing list or membership list will not

```

30 REM title & initialise
40
50 NODE Q:CLS:PRINT:PRINT:PRINT:PRINT STRING$(20,"");PRINT*
  BARBASE *;PRINT* data scrambler *;PRINT* ;CHR$(164);*
  J.F.Darks,NEWS *;PRINT STRING$(20,"");FOR c=1 TO 2000:NEXT
60 OPENOUT"dummy":MEMORY HIGHEN-1:CLOSEOUT:CLS:MODE 2:WINDOW #1,1,80,20
  ,25:WINDOW #0,1,80,1,20:DIM info$(2000):DEFINT a-z
70
80 REM options
90
100 PRINT#1,"OPTIONS : A- Encode files B- Decode files"
110 a$=INKEY$:IF a$="" THEN 110
120 IF a$="a" OR a$="A" THEN t$="scramble":option=1
130 IF a$="b" OR a$="B" THEN t$="decode":option=2
140 PRINT#1,"Do you wish the codeword revealed?(y/n)"
150 a$=INKEY$:IF a$="" THEN 150
160 IF a$="y" OR a$="Y" THEN hide=1 ELSE hide=0
170 CAT:CLS#1:PRINT #1,"GARBAGE - select files to t$:t$:n=1
180 INPUT #1, a$(n):IF a$(n)="" THEN 240
190 PRINT#1,"Another? ENTER to proceed, or input further file name."
200 n=n+1:limit=n-1:GOTO 180
210
220 REM enter codeword, check for validity & read into array 'code$(c)
230
240 CLS#1:PRINT#1,"INPUT CODEWORD (any length)":
250 IF hide=1 THEN 280
260 PRINT#1,"*WAIT FOR TIME!*:BORDER 20,1:PRINT#1:FOR x=1 TO 2000:NEXT
270 PRINT#1,"THIS WILL NOT APPEAR ON SCREEN *":PRINT#1:FOR x=1 TO 2000
:NEXT:PRINT#1,"(So make sure you get it right !)":FOR x=1 TO 2000:NEXT
:BORDER 1:PRINT CHR$(71):PRINT CHR$(21):INPUT code$:PRINT CHR$(6):CLS#1
:GOTO 290
280 INPUT #1, code$:CLS#1
290 code$=UPPER$(code$)
300 FOR n=1 TO LEN(code$):IF ASC(MID$(code$,n,1))>90 OR ASC(MID$(code$,
n,1))<65 THEN PRINT#1,"CODEWORD INVALID":FOR t=1 TO 1500:NEXT :GOTO
240
310 NEXT n
320 c=LEN(code$):DIM code(c)
330 FOR x=1 TO c:code(x)=ASC(MID$(code$,x,1)):NEXT x
340
350 REM read in file for processing into array 'info$(2000)'
360
370 FOR file=1 TO limit:z=0
380 OPENIN a$(file)
390 WHILE EOF=0
400 z=z+1:LINE INPUT #1,info$(z)
410 WEND
420 CLOSEIN
430
440 REM select subroutine for scrambling or decoding
450
460 PRINT#1,"PROCESSING "a$(file):" -PLEASE WAIT."
470 IF option=1 THEN GOSUB 630 ELSE GOSUB 710
480
490 REM select suitable filetype name & save file
500
510 name=INSTRa$(file),".*"
520 IF option=1 THEN filetype$="GGG" ELSE filetype$="DEC"
530 name$=LEFT$(a$(file),name)+filetype$
540 OPENOUT name$
550 FOR n=1 TO z
560 PRINT#1,info$(n):NEXT n
570 CLOSEOUT
580 NEXT file
590 PRINT CHR$(71):PRINT#1:PRINT#1,"PROCESSING COMPLETE!":STOP
600
610 REM subroutine for scrambling
620
630 FOR n=0 TO z+1:FOR m=1 TO LEN(info$(n)):z=MID$(info$(n),m,1):IF
ASC(z)<=32 THEN 660
640 number=ASC(z)+code(q):IF number>255 THEN number=number-255
650 z$=CHR$(number)
660 MID$(info$(n),m,1)=z$:qqq+=1:IF q>c THEN q=1
670 NEXT m:NEXT n:RETURN
680
690 REM subroutine for decoding
700
710 FOR n=0 TO z+1:FOR m=1 TO LEN(info$(n)):z=MID$(info$(n),m,1):IF
ASC(z)<=32 THEN 740
720 number=ASC(z)-code(q):IF number<32 THEN number=number+255
730 z$=CHR$(number)
740 MID$(info$(n),m,1)=z$:qqq+=1:IF q>c THEN q=1
750 NEXT m:NEXT n:RETURN

```

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WILBUR

by T A Bartley

Part Two of the adventures of Wilbur, our 100% machine code, multi screen arcade game. This week, use the new loader program to

enter the data into memory and save with *Save ""Code 41886, 2892*. More to look forward to next week.

In the meantime, if all that typing is

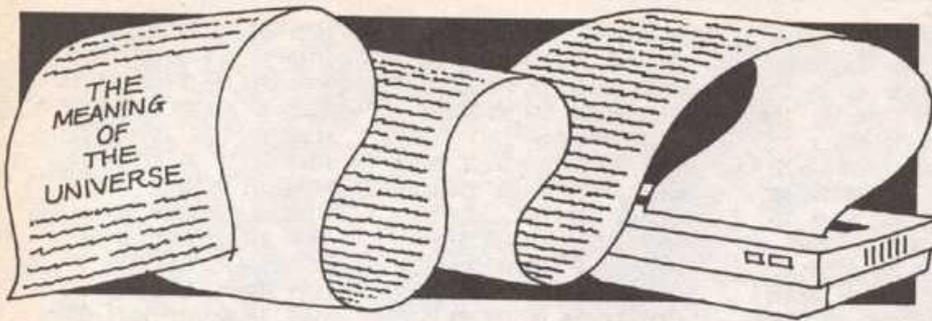
getting to you, write to T A Bartley enclosing £2.00 for a copy of the game on tape: 81 Beverley Cres, Grimsby, South Humberside DN32 9TJ.

```

1000 REM      DECIMAL LOADER
1010 POKE 23609,50
1015 PRINT "START TYPING IN DUMP ONE NUMBER AT A
TIME, EACH NUMBER FOLLOWED BY RETURN"
1020 LET T=0: FOR N=41886 TO 44777
1030 INPUT J: PRINT N,J: POKE N,J: LET T=T+J: NEXT N
1040 IF T<>321152 THEN PRINT "DATA ERROR: CHECK
LISTING"
1050 IF T=321152 THEN PRINT "DATA OK"
    
```

| | | | |
|-------------------------------|------------------------------|-------------------------------|------------------------------|
| 41886 0 0 0 0 3 0 | 42162 163 16 239 201 17 0 | 42438 35 221 110 0 221 102 | 42714 221 203 7 214 221 203 |
| 41892 0 0 0 0 0 0 | 42168 96 33 0 64 1 0 | 42444 1 205 2 164 205 64 | 42720 7 142 24 13 221 190 |
| 41898 0 0 0 0 0 0 | 42174 24 237 176 201 58 128 | 42450 164 58 123 163 119 16 | 42726 5 56 8 221 203 7 |
| 41904 0 0 0 6 16 221 | 42180 162 167 200 71 221 33 | 42456 234 201 58 122 163 167 | 42732 206 221 203 7 150 221 |
| 41910 110 14 221 102 15 124 | 42186 129 162 197 221 203 7 | 42462 200 71 221 33 124 163 | 42738 203 7 78 221 70 3 |
| 41916 198 32 93 87 26 182 | 42192 70 40 25 221 110 0 | 42468 221 94 0 221 86 1 | 42744 40 8 221 53 1 16 |
| 41922 119 35 19 26 182 119 | 42198 221 102 1 221 94 3 | 42474 197 213 221 35 221 35 | 42750 251 195 102 167 221 52 |
| 41928 43 205 207 163 16 237 | 42204 221 86 4 205 2 164 | 42480 221 110 0 221 102 1 | 42756 1 16 251 195 102 167 |
| 41934 201 37 124 230 7 254 | 42210 221 110 5 221 102 6 | 42486 205 254 165 209 193 16 | 42762 221 126 0 221 203 7 |
| 41940 7 192 125 214 32 111 | 42216 221 126 2 119 1 8 | 42492 237 201 6 8 26 47 | 42768 94 40 27 221 190 4 |
| 41946 230 224 254 224 200 124 | 42222 0 221 9 193 16 216 | 42498 166 40 6 62 1 50 | 42774 32 56 221 126 13 167 |
| 41952 198 8 103 201 221 110 | 42228 201 58 128 162 167 200 | 42504 166 163 201 37 19 16 | 42780 32 50 221 203 7 230 |
| 41958 0 221 102 1 205 33 | 42234 71 221 33 129 162 197 | 42510 241 201 62 61 205 244 | 42786 221 203 7 158 205 6 |
| 41964 164 221 117 14 221 116 | 42240 221 126 3 205 244 163 | 42516 163 58 157 163 167 200 | 42792 169 205 45 169 24 56 |
| 41970 15 201 17 144 226 229 | 42246 221 115 3 221 114 4 | 42522 71 33 128 87 205 2 | 42798 221 190 5 32 29 221 |
| 41976 111 38 0 41 41 41 | 42252 221 110 0 221 102 1 | 42528 164 35 16 250 201 6 | 42804 126 13 60 221 190 8 |
| 41982 25 235 225 201 229 197 | 42258 205 64 164 221 117 5 | 42534 6 17 52 166 33 128 | 42810 32 20 221 203 7 222 |
| 41988 213 245 6 8 26 119 | 42264 221 116 6 1 8 0 | 42540 90 26 119 35 19 16 | 42816 221 203 7 166 221 54 |
| 41994 37 19 16 250 241 209 | 42270 221 9 193 16 220 201 | 42546 250 201 65 70 67 69 | 42822 13 0 205 6 169 205 |
| 42000 193 225 201 33 0 64 | 42276 58 128 162 167 200 33 | 42552 68 66 58 201 162 167 | 42828 45 169 24 22 221 126 |
| 42006 17 1 64 1 255 23 | 42282 159 163 58 120 92 190 | 42558 200 71 221 33 202 162 | 42834 13 167 32 16 62 8 |
| 42012 175 119 237 176 201 125 | 42288 200 33 158 163 126 167 | 42564 197 33 96 204 221 126 | 42840 221 203 7 94 40 2 |
| 42018 15 15 15 230 31 111 | 42294 40 2 53 201 54 5 | 42570 2 167 40 7 71 17 | 42846 237 68 221 134 0 221 |
| 42024 124 7 7 230 224 181 | 42300 58 128 162 71 221 33 | 42576 32 0 25 16 253 221 | 42852 119 0 205 228 163 14 |
| 42030 111 124 230 7 8 124 | 42306 129 162 197 221 203 7 | 42582 117 11 221 116 12 221 | 42858 1 205 77 164 205 114 |
| 42036 15 15 15 230 24 246 | 42312 70 40 13 221 110 5 | 42588 70 8 25 16 253 221 | 42864 167 201 221 110 14 221 |
| 42042 64 103 8 180 103 201 | 42318 221 102 6 126 238 64 | 42594 117 16 221 116 17 1 | 42870 102 15 124 230 7 254 |
| 42048 124 230 24 203 47 203 | 42324 119 205 97 165 1 8 | 42600 22 0 221 9 193 16 | 42876 7 62 2 40 1 60 |
| 42054 47 203 47 198 88 103 | 42330 0 221 9 193 16 228 | 42606 213 201 58 201 162 167 | 42882 8 205 64 164 229 17 |
| 42060 201 6 16 221 94 19 | 42336 201 221 110 0 221 102 | 42612 200 33 164 163 58 120 | 42888 32 0 221 203 7 94 |
| 42066 221 86 20 221 110 14 | 42342 1 221 94 3 221 86 | 42618 92 190 200 119 221 33 | 42894 40 14 221 126 5 214 |
| 42072 221 102 15 58 170 163 | 42348 4 6 8 26 47 166 | 42624 201 162 221 70 0 221 | 42900 8 221 190 0 56 28 |
| 42078 167 32 14 26 203 65 | 42354 40 20 217 205 85 171 | 42630 35 197 205 241 168 221 | 42906 35 35 24 17 221 203 |
| 42084 40 10 166 40 6 62 | 42360 217 205 141 165 205 21 | 42636 203 7 70 40 6 205 | 42912 7 102 40 37 221 126 |
| 42090 1 50 166 163 201 26 | 42366 171 33 169 163 53 221 | 42642 147 164 205 161 166 167 | 42918 4 198 7 221 190 0 |
| 42096 182 119 35 19 58 170 | 42372 54 7 0 201 37 19 | 42648 1 22 0 221 9 193 | 42924 48 8 43 62 7 119 |
| 42102 163 167 32 14 26 203 | 42378 16 227 201 221 110 5 | 42654 16 231 201 205 6 169 | 42930 167 237 82 119 221 126 |
| 42108 65 40 10 166 40 6 | 42384 221 102 6 62 7 119 | 42660 205 32 169 221 203 7 | 42936 6 225 119 35 17 33 |
| 42114 62 1 50 166 163 201 | 42390 221 110 0 221 102 1 | 42666 78 32 18 221 203 7 | 42942 0 119 167 237 82 8 |
| 42120 26 182 119 43 205 207 | 42396 221 94 3 221 86 4 | 42672 86 32 12 221 203 7 | 42948 61 200 8 24 241 221 |
| 42126 163 19 16 201 201 205 | 42402 6 8 26 47 166 119 | 42678 94 32 11 221 203 7 | 42954 203 7 78 40 13 221 |
| 42132 228 163 6 16 221 110 | 42408 37 19 16 248 201 58 | 42684 102 32 5 205 204 166 | 42960 126 5 214 8 221 190 |
| 42138 14 221 102 15 221 94 | 42414 122 163 167 200 71 221 | 42690 24 3 205 10 167 221 | 42966 1 56 221 25 24 18 |
| 42144 19 221 86 20 26 47 | 42420 33 124 163 221 126 0 | 42696 203 7 134 201 221 126 | 42972 221 126 4 198 8 221 |
| 42150 166 119 19 35 26 47 | 42426 205 244 163 221 115 0 | 42702 1 221 203 7 78 40 | 42978 190 1 48 208 8 71 |
| 42156 166 119 19 43 205 207 | 42432 221 114 1 221 35 221 | 42708 15 221 190 4 48 23 | 42984 8 167 237 82 16 251 |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------|-----|-----|-----|-----|-----|-----|-------|-----|-----|-----|-----|-----|-----|-------|-----|-----|-----|-----|-----|-----|-------|-----|-----|-----|-----|-----|-----|
| 42990 | 62 | 7 | 119 | 35 | 119 | 24 | 43440 | 176 | 221 | 110 | 4 | 221 | 102 | 43890 | 254 | 7 | 32 | 2 | 54 | 0 | 44334 | 0 | 75 | 13 | 213 | 229 | 209 |
| 42996 | 193 | 221 | 33 | 215 | 161 | 221 | 43446 | 5 | 126 | 50 | 128 | 162 | 167 | 43896 | 35 | 124 | 254 | 91 | 32 | 243 | 44340 | 0 | 213 | 43 | 237 | 184 | 18 |
| 43002 | 70 | 0 | 221 | 35 | 197 | 221 | 43452 | 40 | 18 | 35 | 71 | 17 | 129 | 43902 | 201 | 42 | 28 | 172 | 70 | 35 | 44346 | 225 | 17 | 32 | 0 | 167 | 237 |
| 43008 | 126 | 4 | 205 | 244 | 163 | 221 | 43458 | 162 | 197 | 1 | 4 | 0 | 237 | 43908 | 62 | 63 | 164 | 103 | 34 | 28 | 44352 | 82 | 209 | 193 | 16 | 231 | 201 |
| 43014 | 110 | 0 | 221 | 102 | 1 | 229 | 43464 | 176 | 19 | 19 | 19 | 19 | 193 | 43914 | 172 | 120 | 201 | 230 | 7 | 135 | 44358 | 62 | 8 | 1 | 0 | 0 | 17 |
| 43020 | 205 | 58 | 168 | 225 | 205 | 28 | 43470 | 16 | 243 | 221 | 110 | 6 | 221 | 43920 | 95 | 22 | 0 | 33 | 30 | 172 | 44364 | 32 | 24 | 33 | 223 | 87 | 245 |
| 43026 | 168 | 1 | 6 | 0 | 221 | 9 | 43476 | 102 | 7 | 126 | 50 | 201 | 162 | 43926 | 25 | 94 | 35 | 86 | 235 | 233 | 44370 | 213 | 17 | 32 | 0 | 4 | 25 |
| 43032 | 193 | 16 | 227 | 201 | 205 | 64 | 43482 | 167 | 40 | 23 | 35 | 71 | 17 | 43932 | 6 | 24 | 197 | 205 | 150 | 173 | 44376 | 16 | 253 | 65 | 4 | 35 | 16 |
| 43038 | 164 | 221 | 126 | 3 | 8 | 221 | 43488 | 202 | 162 | 197 | 1 | 11 | 0 | 43938 | 205 | 70 | 173 | 193 | 16 | 246 | 44382 | 253 | 209 | 66 | 5 | 197 | 6 |
| 43044 | 70 | 2 | 221 | 126 | 5 | 229 | 43494 | 237 | 176 | 229 | 213 | 225 | 17 | 43944 | 201 | 6 | 24 | 197 | 205 | 125 | 44388 | 0 | 75 | 213 | 229 | 17 | 32 |
| 43050 | 119 | 35 | 16 | 252 | 225 | 17 | 43500 | 11 | 0 | 25 | 235 | 225 | 193 | 43950 | 173 | 205 | 9 | 173 | 205 | 150 | 44394 | 0 | 25 | 209 | 229 | 237 | 176 |
| 43056 | 32 | 0 | 167 | 237 | 82 | 8 | 43506 | 16 | 238 | 221 | 110 | 8 | 221 | 43956 | 173 | 205 | 70 | 173 | 193 | 16 | 44400 | 225 | 209 | 193 | 120 | 16 | 236 |
| 43062 | 61 | 200 | 24 | 232 | 221 | 70 | 43512 | 102 | 9 | 126 | 50 | 122 | 163 | 43962 | 240 | 201 | 6 | 32 | 197 | 205 | 44406 | 241 | 67 | 119 | 35 | 16 | 252 |
| 43068 | 3 | 197 | 229 | 221 | 70 | 2 | 43518 | 167 | 40 | 8 | 17 | 122 | 163 | 43968 | 125 | 173 | 205 | 9 | 173 | 193 | 44412 | 201 | 6 | 192 | 17 | 255 | 87 |
| 43074 | 205 | 2 | 164 | 35 | 16 | 250 | 43524 | 1 | 12 | 0 | 237 | 176 | 221 | 43974 | 16 | 246 | 201 | 6 | 24 | 197 | 44418 | 213 | 225 | 43 | 197 | 1 | 31 |
| 43080 | 225 | 125 | 254 | 32 | 48 | 5 | 43530 | 126 | 10 | 50 | 162 | 163 | 201 | 43980 | 205 | 125 | 173 | 205 | 9 | 173 | 44424 | 0 | 26 | 237 | 184 | 35 | 54 |
| 43086 | 1 | 32 | 7 | 24 | 3 | 1 | 43536 | 33 | 33 | 161 | 58 | 213 | 161 | 43986 | 205 | 46 | 172 | 205 | 203 | 172 | 44430 | 0 | 43 | 43 | 27 | 193 | 16 |
| 43092 | 32 | 0 | 167 | 237 | 66 | 193 | 43542 | 167 | 40 | 7 | 71 | 17 | 9 | 43992 | 193 | 16 | 240 | 201 | 6 | 24 | 44436 | 240 | 201 | 17 | 0 | 64 | 6 |
| 43098 | 16 | 225 | 201 | 33 | 102 | 169 | 43548 | 0 | 25 | 16 | 253 | 235 | 201 | 43998 | 197 | 205 | 46 | 172 | 205 | 203 | 44442 | 23 | 197 | 213 | 6 | 8 | 197 |
| 43104 | 17 | 134 | 163 | 1 | 22 | 0 | 43554 | 33 | 128 | 162 | 6 | 9 | 197 | 44004 | 172 | 193 | 16 | 246 | 201 | 6 | 44448 | 213 | 98 | 123 | 254 | 224 | 32 |
| 43110 | 237 | 176 | 201 | 58 | 110 | 162 | 43560 | 1 | 8 | 0 | 9 | 26 | 119 | 44010 | 24 | 197 | 205 | 126 | 172 | 205 | 44454 | 8 | 46 | 0 | 122 | 198 | 8 |
| 43116 | 167 | 200 | 33 | 165 | 163 | 58 | 43566 | 19 | 193 | 16 | 245 | 201 | 33 | 44016 | 151 | 172 | 205 | 46 | 172 | 205 | 44460 | 103 | 24 | 3 | 198 | 32 | 111 |
| 43122 | 120 | 92 | 190 | 200 | 119 | 33 | 43572 | 128 | 162 | 6 | 9 | 197 | 1 | 44022 | 203 | 172 | 193 | 16 | 240 | 201 | 44466 | 1 | 32 | 0 | 237 | 176 | 209 |
| 43128 | 127 | 162 | 126 | 167 | 40 | 2 | 43578 | 8 | 0 | 9 | 126 | 18 | 19 | 44028 | 6 | 32 | 197 | 205 | 126 | 172 | 44472 | 20 | 193 | 16 | 227 | 209 | 123 |
| 43134 | 53 | 201 | 54 | 5 | 33 | 113 | 43584 | 193 | 16 | 245 | 201 | 33 | 33 | 44034 | 205 | 151 | 172 | 193 | 16 | 246 | 44478 | 198 | 32 | 95 | 167 | 32 | 4 |
| 43140 | 162 | 58 | 126 | 162 | 134 | 205 | 43590 | 161 | 17 | 34 | 161 | 1 | 179 | 44040 | 201 | 6 | 24 | 197 | 205 | 126 | 44484 | 122 | 198 | 8 | 87 | 193 | 16 |
| 43146 | 244 | 163 | 221 | 33 | 114 | 162 | 43596 | 0 | 62 | 1 | 119 | 237 | 176 | 44046 | 172 | 205 | 151 | 172 | 205 | 150 | 44490 | 208 | 33 | 224 | 87 | 205 | 106 |
| 43152 | 58 | 110 | 162 | 71 | 197 | 221 | 43602 | 201 | 0 | 0 | 0 | 0 | 0 | 44052 | 173 | 205 | 70 | 173 | 193 | 16 | 44496 | 172 | 201 | 33 | 231 | 90 | 58 |
| 43158 | 110 | 0 | 221 | 102 | 1 | 221 | 43608 | 0 | 0 | 0 | 0 | 0 | 0 | 44058 | 240 | 201 | 0 | 0 | 156 | 171 | 44502 | 171 | 163 | 167 | 200 | 71 | 62 |
| 43164 | 70 | 2 | 205 | 2 | 164 | 35 | 43614 | 0 | 0 | 0 | 0 | 0 | 83 | 44064 | 169 | 171 | 188 | 171 | 201 | 171 | 44508 | 2 | 197 | 6 | 5 | 119 | 35 |
| 43170 | 16 | 250 | 221 | 35 | 221 | 35 | 43620 | 67 | 79 | 82 | 69 | 72 | 73 | 44070 | 220 | 171 | 233 | 171 | 252 | 171 | 44514 | 16 | 252 | 60 | 193 | 16 | 245 |
| 43176 | 221 | 35 | 193 | 16 | 231 | 33 | 43626 | 83 | 67 | 79 | 82 | 69 | 80 | 44076 | 9 | 172 | 17 | 224 | 87 | 6 | 44520 | 58 | 171 | 163 | 71 | 33 | 231 |
| 43182 | 126 | 162 | 58 | 111 | 162 | 167 | 43632 | 79 | 84 | 73 | 79 | 78 | 33 | 44082 | 23 | 197 | 213 | 6 | 8 | 197 | 44526 | 87 | 197 | 229 | 6 | 5 | 62 |
| 43188 | 32 | 10 | 126 | 254 | 3 | 32 | 43638 | 135 | 87 | 34 | 83 | 170 | 6 | 44088 | 213 | 98 | 123 | 167 | 32 | 8 | 44532 | 60 | 205 | 244 | 163 | 225 | 205 |
| 43194 | 3 | 54 | 0 | 201 | 52 | 201 | 43644 | 5 | 33 | 99 | 170 | 205 | 190 | 44094 | 46 | 224 | 122 | 214 | 8 | 103 | 44538 | 2 | 164 | 35 | 16 | 250 | 193 |
| 43200 | 126 | 167 | 40 | 2 | 53 | 201 | 43650 | 170 | 33 | 147 | 87 | 34 | 83 | 44100 | 24 | 3 | 214 | 32 | 111 | 1 | 44544 | 16 | 237 | 201 | 58 | 171 | 163 |
| 43206 | 54 | 3 | 201 | 58 | 110 | 162 | 43656 | 170 | 6 | 7 | 33 | 104 | 170 | 44106 | 32 | 0 | 237 | 176 | 209 | 21 | 44550 | 167 | 200 | 58 | 170 | 163 | 167 |
| 43212 | 167 | 200 | 71 | 221 | 33 | 114 | 43662 | 205 | 190 | 170 | 33 | 224 | 87 | 44112 | 193 | 16 | 228 | 209 | 123 | 214 | 44556 | 32 | 20 | 62 | 253 | 219 | 254 |
| 43218 | 162 | 197 | 221 | 110 | 0 | 221 | 43668 | 34 | 85 | 170 | 6 | 8 | 33 | 44118 | 32 | 95 | 254 | 224 | 32 | 4 | 44562 | 230 | 31 | 87 | 62 | 191 | 219 |
| 43224 | 102 | 1 | 205 | 64 | 164 | 58 | 43674 | 111 | 170 | 205 | 190 | 170 | 201 | 44124 | 122 | 214 | 8 | 87 | 193 | 16 | 44568 | 254 | 162 | 254 | 31 | 200 | 62 |
| 43230 | 112 | 162 | 221 | 70 | 2 | 119 | 43680 | 33 | 141 | 87 | 34 | 83 | 170 | 44130 | 208 | 33 | 0 | 71 | 205 | 106 | 44574 | 1 | 50 | 170 | 163 | 33 | 172 |
| 43236 | 35 | 16 | 252 | 221 | 35 | 221 | 43686 | 6 | 5 | 33 | 85 | 170 | 205 | 44136 | 172 | 201 | 6 | 8 | 197 | 229 | 44580 | 163 | 58 | 120 | 92 | 190 | 200 |
| 43242 | 35 | 221 | 35 | 193 | 16 | 227 | 43692 | 190 | 170 | 201 | 33 | 155 | 87 | 44142 | 229 | 209 | 19 | 175 | 119 | 1 | 44586 | 119 | 33 | 173 | 163 | 126 | 167 |
| 43248 | 201 | 221 | 126 | 21 | 221 | 190 | 43698 | 34 | 83 | 170 | 6 | 5 | 33 | 44148 | 31 | 0 | 237 | 176 | 225 | 37 | 44592 | 40 | 2 | 53 | 201 | 54 | 5 |
| 43254 | 10 | 40 | 4 | 221 | 52 | 21 | 43704 | 90 | 170 | 205 | 190 | 170 | 201 | 44154 | 193 | 16 | 239 | 201 | 6 | 192 | 44598 | 42 | 175 | 163 | 229 | 6 | 8 |
| 43260 | 201 | 221 | 54 | 21 | 0 | 221 | 43710 | 197 | 229 | 126 | 205 | 244 | 163 | 44160 | 17 | 0 | 64 | 213 | 225 | 35 | 44604 | 126 | 203 | 39 | 119 | 37 | 16 |
| 43266 | 203 | 7 | 198 | 201 | 221 | 203 | 43716 | 42 | 83 | 170 | 205 | 2 | 164 | 44166 | 197 | 1 | 31 | 0 | 26 | 237 | 44610 | 252 | 167 | 225 | 192 | 45 | 34 |
| 43272 | 7 | 126 | 40 | 6 | 221 | 203 | 43722 | 33 | 83 | 170 | 52 | 225 | 35 | 44172 | 176 | 43 | 54 | 0 | 35 | 35 | 44616 | 175 | 163 | 58 | 174 | 163 | 61 |
| 43278 | 7 | 94 | 32 | 7 | 221 | 110 | 43728 | 193 | 16 | 235 | 201 | 17 | 85 | 44178 | 19 | 193 | 16 | 240 | 201 | 62 | 44622 | 40 | 4 | 50 | 174 | 163 | 201 |
| 43284 | 11 | 221 | 102 | 12 | 201 | 221 | 43734 | 170 | 42 | 95 | 170 | 24 | 6 | 44184 | 8 | 1 | 0 | 0 | 17 | 32 | 44628 | 62 | 5 | 50 | 174 | 163 | 58 |
| 43290 | 110 | 16 | 221 | 102 | 17 | 201 | 43740 | 17 | 90 | 170 | 42 | 97 | 170 | 44190 | 24 | 33 | 225 | 87 | 245 | 213 | 44634 | 171 | 163 | 61 | 50 | 171 | 163 |
| 43296 | 221 | 126 | 9 | 221 | 190 | 18 | 43746 | 1 | 240 | 216 | 205 | 10 | 171 | 44196 | 17 | 32 | 0 | 4 | 25 | 16 | 44640 | 33 | 230 | 87 | 79 | 135 | 135 |
| 43302 | 40 | 5 | 221 | 52 | 18 | 24 | 43752 | 18 | 19 | 1 | 24 | 252 | 205 | 44202 | 253 | 65 | 4 | 35 | 16 | 253 | 44646 | 129 | 133 | 111 | 34 | 175 | 163 |
| 43308 | 7 | 221 | 52 | 13 | 221 | 54 | 43758 | 10 | 171 | 18 | 19 | 1 | 156 | 44208 | 209 | 66 | 241 | 197 | 6 | 0 | 44652 | 175 | 50 | 170 | 163 | 201 | 144 |
| 43314 | 18 | 0 | 221 | 126 | 8 | 167 | 43764 | 255 | 205 | 10 | 171 | 18 | 19 | 44214 | 75 | 13 | 213 | 229 | 209 | 0 | 44658 | 175 | 16 | 176 | 247 | 175 | 77 |
| 43320 | 40 | 37 | 221 | 190 | 13 | 32 | 43770 | 1 | 246 | 255 | 205 | 10 | 171 | | | | | | | | | | | | | | |



Random words

by Richard Hoptroff

This week, the remainder of the listing for the Random Words program, plus the program notes.

Program Notes

In Line 260, the name of the main character is defined. Then, in the *Data* statements at the end, the computer is taught all the other words it knows. If a printer is to be used, the word *Remark* should be removed from Line 280.

Your own personal words can be added to the *Data* file, but the variables in Lines 10 and 40 should be altered to total thus:

NCj - Number of conjunctives (and, but. . .), minus one. These must appear at the beginning of the *Data* block, at Line 2000.

NSj - Number of subjective nouns (I, he, she. . .), minus one. The *Data* for these starts at Line

3000.
NPs - Number of personal pronouns (my, his, her. . .), minus one. This *Data* starts at Line 4000.

NNb - Number of "numbers" (the, a), minus one. This *Data* is on Line 4990.

NNn - Number of nouns (brussel sprout, size nine chucker boot, kitchen sink. . .), minus one. This *Data* starts at Line 5000.

NVb - Number of past tense verbs (attacked, nibbled. . .), minus one. This *Data* starts at Line 6000.

NAj - Number of adjectives (homicidal, half eaten. . .), minus one. This *Data* starts at Line 7000.

NCm - Number of comments (then, meanwhile. . .), minus one. This *Data* starts at Line 8000.

NAv - Number of adverbs (frantically, suddenly. . .), minus one. This

Data starts at Line 9000.

NQt - Number of quotes ("Go jump in a lake", "You smell like a. . ."), minus one. This *Data* starts at Line 10000.

NPh - Number of verbs of phrases of the form noun, verb, adjective, (wasn't tried hard to be. . .), minus one. This *Data* starts at Line 11000.

NWy - Number of reasons why (for tax reasons, for the money. . .), minus one. This *Data* comes last at Line 12000.

Ltn - Number of verbs that require a noun after them, minus one. These verbs must be at the beginning of the verb *Data*.

Snn - Number of quotes needing nouns to finish them, minus one. These quotes must be at the beginning of the quote *Data*.

```

1210 fin$='
1220 END DEFINE
1240 DEFINE PROCEDURE Capsthk$
1250 LOCAL fred$,ted
1260 IF Cpf=0 :ans$=hjk$:RETURN
1300 ted = CODE(hjk$(1)):Cpf=0:IF ted>95:ted=ted-32
1310 IF LEW(hjk$)=1:ans$=CHR$(ted):RETURN
1320 fred$=CHR$(ted) & hjk$(2 TO)
1340 ans$=fred$
1360 END DEFINE
1400 DEFINE PROCEDURE An(hk$)
1410 IF anf=0:Caps(hk$):PRINT 'ans$':RETURN
1420 anf=0:IF hk$(1) INSTR "aeiouAEIOU":Caps("a"):PRINT 'ans$':
hk$:RETURN
1430 Caps("a"):PRINT 'ans$':hk$!
1440 END DEFINE
1500 DEFINE PROCEDURE Mueb
1510 Caps(Nb$(RND(NNb))):IF ans$='a' :anf=1:RETURN
1511 IF ans$='A':anf=1:Cpf=1:RETURN
1520 PRINT 'ans$!'
1530 END DEFINE
2000 DATA 'before','when','and then','but','but','after','and','a
nd','because'
3000 DATA 'I','I','Neil Kinnock','Mrs Thatcher','he','she','it',
'they'
4000 DATA 'his','her','my','the','my','the','its','their','its'
4990 DATA 'the','the','a'
5000 DATA 'cowpat','chain saw','kitchen sink','parrot','Sloane Ra
nger','sperm whale','slice of lemon','wheelbarrow','brick','evang
elist'
5001 DATA 'prawn cocktail','iceberg','oyster','eucalyptus tree','c
aeel','Chesterfield sofa','puff of saoke','spring onion','kitten'
,'pebble'
5002 DATA 'gnose','dingo','size nine chucker boot','duckbilled pl
atypus','unknown globule','mug of hot tea','cloud','coffee percol
ator','pot of earwax','penguin'
5003 DATA 'lump','four letter word','vodka martini','teddy bear',
'philosopher','poet','bolt of lightning','broadsword','black hol
e','glass of water'
5004 DATA 'glob of mucus','brussel sprout','botton','elephant','p
int of Guinness','wooden leg','aspidistra','aaron','shady characte

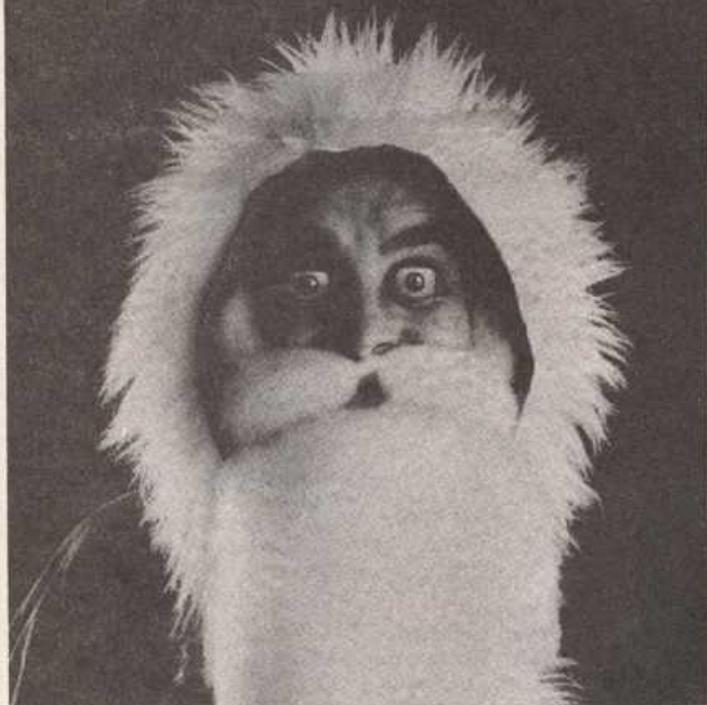
```

```

r','punk'
5005 DATA 'territe','sewage works','lizard'
6000 DATA 'ate','made love to','changed into','fell into','superg
loed it to','nibbled','perplexed','created','peuked up','crucifie
d'
6001 DATA 'dispised','exorcised','ressurrected','dessiated','stol
e','crashed into','escaped from','shot','looked like','saelled'
6002 DATA 'felt like','turned into','found','searched in vain for
','force fed it with','got earried to','graffitted all over','ser
enaded','hit it with','groped'
6003 DATA 'stole','gave him','aggravated','pretended to be','gave
birth to'
6500 DATA 'snorted','started a revolution','dissappeared','tempo
rily died','went on holiday','went to jail','tried to, but couldn
't','refused','appeared'
7000 DATA 'green spotted','blubbery','furry','deranged','Yiddish'
,'alcoholic','enormous','docile','three-legged','angry'
7001 DATA 'horrendous','mutant','perilous','magic','ubiquitous',
'dead','red striped','lumpy','infamous','stupid'
7002 DATA 'blind drunk','existential','prieval','fat','ravenous'
,'intelgent','rather large','bouncy','retarded','extremely tall
'
7003 DATA 'tempramental','saelly','carniverous','unshaven','hairy
','manically depressed','litttle','motionless','grotesque','becuse
d'
7004 DATA 'electronic','stylish','homocidal','nauseous','massive'
,'greasy','dirty'
8000 DATA 'then','next','soon','meanwhile','still','however'
9000 DATA 'visciously','quickly','slowly','accidently','publicly'
,'suddenly','frantically','temporarily','half-heartedly'
10000 DATA 'Go and seek the','Go and autate into a','Go and find
everything but the','I've got a','I wish I was a','You must slay
a','You look like a','Go stick your head in a','I've just seen th
e','Ooh, I could really handle a'
10001 DATA 'You smell like a'
10500 DATA 'Go jump in a lake.','Go forth and multiply.','Mine's
bigger than yours.','Pog off.','Tum te tum te tum'
11000 DATA 'was','tried hard to be','wasn't','looked','felt','did
n't like being','pretended to be','knew what it was like to be'
12000 DATA ', for tax reasons.','', being in one of those woods.',
'- but then, why not?','', for the money.',' - who wouldn't?'

```

CHRISTMAS MICROFAIR



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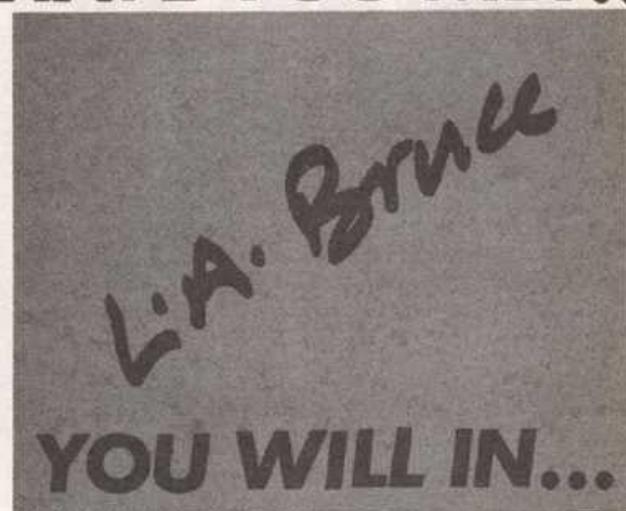
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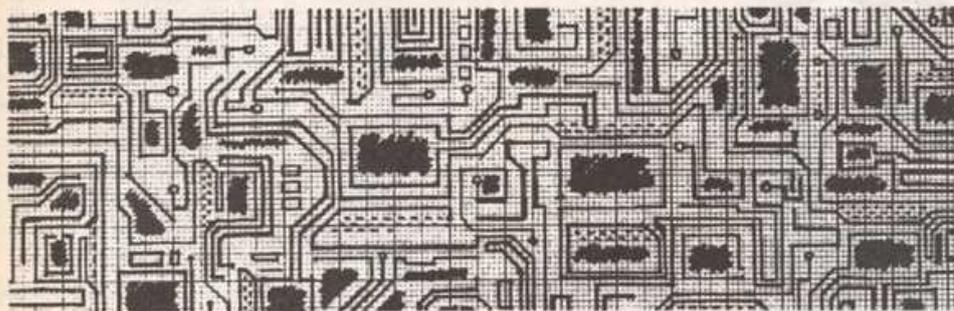
SPECTRUM 48K

HAVE YOU MET...



ROCK'N WRESTLE





BANK STATEMENT

by John Clarke

This is a program for the BBC B to provide a quick and easy Bank Statement. To run it, you'll need a disc drive (although it can be adapted for tape) and possession of an Epson (or Epson compatible) printer would be useful.

To start the program up from scratch, load and run it, type 'W' (for Write), press '1' and enter the details as requested - don't forget to Save all the entries when you have finished. Typing 'P' (for Print) will give you a copy print-out from any part of the statement.

You are limited to 99 entries, which should last most people for a year more or less. But by altering the two lines 630 and 760 to 'BANK2' instead of 'BANK1' then a continuation statement is available, and continues over as many discs as required.

```

10 REM BANK STATEMENT
20 REM by John Clarke
30 REM Emax3:D#max8:M#max10:Dmax8:Cmax8:
   Bmax8
40 @%=&0002020E
50 *TV255,0
60 MODE7:VDU15
70 PRINT""WHITE letters on BLUE....A""
   "BLACK letters on YELLOW....B""CHO
USE by PRESSING the letter required":A$=GET
$:IF A$<>"A" AND A$<>"B" THEN 60
80 IF A$="A" THEN MODE3:VDU19,0,4,0,0,0
90 IF A$="B" THEN MODE3:VDU19,1,0,0,0,0,
   19,0,3,0,0,0
100 DINT$(99),M$(99),D(99),C(99),B(99),P$(
   10)
110 IX=99
120 PROCload
130 ON ERROR GOTO 140
140 IF ERR=17 THEN 170
150 IF ERR=222 THEN CLOSE0:GOTO 170
160 ON ERROR REPORT:PRINT" error line
   "ERL:GOTO170
170 PROCheading
180 REPEAT
190 PROCinfo
200 UNTIL FALSE
210 END
220 DEFPROCheading:VDU28,0,1,79,0
230 PRINT"No";TAB(6)"DATE"TAB(17)
   "METHOD"TAB(37)"DEBIT"TAB(50)"CREDIT
   "TAB(63)"BALANCE"
240 ENDPROC
250 DEFPROCinfo
260 PROCbase_window
270 PRINT" L-LOAD S-SAVE P-PRINT
   R-READ W-WRITE E-END A-ALTER an
   entry"
280 A$=GET$:IF A$="R"PROCread
290 IF A$="W"PROCwrite
300 IF A$="S"PROCsave
310 IF A$="P"PROCprint
320 IF A$="L"PROCload
330 IF A$="A"PROCalter
340 IF A$="E" CLEAR:MODE7:PRINTTAB(14,8)
   ;"STOPPED":FOR L= 11 TO 12:PRINTTAB(8,
   L);CHR#141;CHR#134;"HAVE YOU SWAPPED":NEXT:
   FOR L= 15 TO 16:PRINTTAB(9,L);CHR#141
   ;CHR#131;"HAVE YOU SAVED":NEXT:END
350 ENDPROC
360 DEFPROCtop_window
370 VDU28,0,21,79,2:CLS
380 ENDPROC
390 DEFPROCbase_window
400 VDU28,0,24,79,22:CLS
410 ENDPROC
420 DEFPROCread
430 PROCheading
440 PROCTop_window
450 FOR N%=1 TO IX
460 N%=STR$(N%)
470 PRINTTAB(0);N%TAB(6);T$(N%)TAB(18);M$(
   N%),D(N%),C(N%),B(N%)
480 NEXT N%
490 ENDPROC
500 DEFPROCwrite
510 PROCheading
520 PROCbase_window
530 CLS:INPUT"Item no:"IX:CLS
540 PROCentry_date:CLS
550 PROCentry_method:CLS
560 PROCentry_debit:CLS
570 PROCentry_credit:CLS
580 IF IX=1 B(1)=C(1)
590 IF IX>1 B=B(IX-1):B(IX)=G-D(IX)+C(IX)
600 PROCread
610 ENDPROC
620 DEFPROCsave
630 X=OPENOUT"BANK1"
640 *FX200,1
650 FORN%=1 TO IX
660 PRINTEX,T$(N%),M$(N%),D(N%),C(N%),B(N%)
670 N%=STR$(N%)
680 PRINTTAB(0);N%TAB(6);T$(N%)TAB(18);M$(
   N%),D(N%),C(N%),B(N%)
690 NEXT N%
700 CLOSEEX
710 *FX200,0
720 ENDPROC
730 DEFPROCload
740 *FX200,1
750 PROCTop_window
760 Y=OPENIN"BANK1"
770 N%=1
780 REPEAT
790 INPUTEY,T$(N%),M$(N%),D(N%),C(N%),B(N%)
800 N%=STR$(N%)
810 PRINTTAB(0);N%TAB(6);T$(N%)TAB(17);
   M$(N%),D(N%),C(N%),B(N%)
820 N%=N%+1
830 UNTIL EOFEY:IX=N%-1
840 CLOSEEY
850 *FX200,0
860 ENDPROC
870 DEF PROCentry_date
880 LOCAL A$,B$
890 PRINT"DATE:";
900 A$=""
910 B$=GET$
920 IF B$=CHR#13 THEN T$(IX)=A$:PRINT:
   ENDPROC

```

```

930 IF B$=CHR$13 AND A$<>" THEN =A$
940 IF B$=CHR$127 AND A$<>" THEN VDU127:
A$=LEFT$(A$,LEN(A$)-1):GOTO910
950 IF LEN(A$)=6 THEN VDU7:GOTO910
960 A$=A$+B$:PRINT B$:GOTO 910
970 DEF PROCentry_method
980 LOCAL A$,B$,C$
990 PRINT"METHOD:";
1000 A$="";C$=" "
1010 B$=GET$
1020 IF LEN(A$)<5 AND B$=CHR$13 THEN
A$=A$+C$:M$(I$)=A$:ENDPROC
1030 IF B$=CHR$13 THEN M$(I$)=A$:ENDPROC
1040 IF B$=CHR$13 AND A$<>" THEN =A$
1050 IF B$=CHR$127 AND A$<>" THEN VDU127:A$
=LEFT$(A$,LEN(A$)-1):GOTO1010
1060 IF LEN(A$)=10 THEN VDU7:GOTO1010
1070 A$=A$+B$:PRINT B$:GOTO 1010
1080 DEF PROCentry_debit
1090 LOCAL A$,B$
1100PRINT"DEBIT:";
1110 A$=" "
1120 B$=GET$
1130 IF B$=CHR$13 THEN D(I$)=VAL(A$):
PRINT:ENDPROC
1140 IF B$=CHR$13 AND A$<>" THEN =A$
1150 IF B$=CHR$127 AND A$<>" THEN VDU127:
A$=LEFT$(A$,LEN(A$)-1):GOTO1120
1160 IF LEN(A$)=7 THEN VDU7:GOTO1120
1170 A$=A$+B$:PRINT B$:GOTO 1120
1180 DEF PROCentry_credit
1190 LOCAL A$,B$
1200 PRINT"CREDIT:";
1210 A$=" "

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```

1220 B$=GET$
1230 IF B$=CHR$13 THEN C(I$)=VAL(A$):
PRINT:ENDPROC
1240 IF B$=CHR$13 AND A$<>" THEN =A$
1250 IF B$=CHR$127 AND A$<>" THEN VDU127:
A$=LEFT$(A$,LEN(A$)-1):GOTO1220
1260 IF LEN(A$)=7 THEN VDU7:GOTO1220
1270 A$=A$+B$:PRINT B$:GOTO 1220
1280 DEFPROCprint
1290 LOCAL N$,P$
1300 PROCbase_window
1310 CLS:INPUT"Print from which no:-";P$
1320 VDU2: *FX200,1
1330 PRINT"No:"TAB(8)"DATE"TAB(18)"METHOD"
TAB(37)"DEBIT"TAB(50)"CREDIT"TAB(63)"
BALANCE":PRINT'
1340 FOR N%=P% TO I%
1350 N$=STR$(N%)
1360 PRINTTAB(0);N$TAB(8);T$(N%)TAB(18);
M$(N%),D(N%),C(N%),B(N%)
1370 NEXT N%
1380 VDU3: *FX200,0:ENDPROC
1390 DEFPROCalter
1400 S%=I%
1410 PROCbase_window
1420 PRINT"Altering an item Y/N"
1430 A$=GET$:IF A$="N" THEN ENDPROC
1440 PROCwrite
1450 FOR N=I% TO S%-1
1460 I%=I%+1
1470 B(I%)=B(I%-1)+C(I%)-D(I%)
1480 NEXT
1490 PROCread
1500 ENDPROC

```

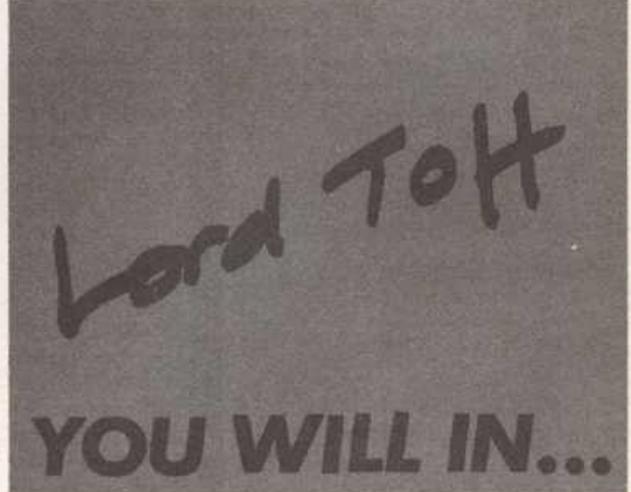
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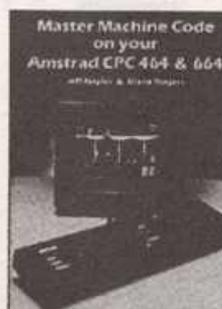
The CODE MACHINE consists of an Assembler and a separate Monitor (both relocatable) and provides all the requirements for rapid assembly language development, including many features not found elsewhere.

A 72 page manual, with plenty of examples, and a flexible command structure make it ideal for beginners, yet it offers all the sophistication and fine detail required by professionals.

Single Stepping your machine code is an essential aid to both learning and debugging and the CODE MACHINE's excellent Front Panel display gives you the most complete picture of what's happening at every step. You can really see what's going on.

Everything about the CODE MACHINE is designed for speed, simplicity, and information. It's received much praise from the industry and is the No. 1 choice of many leading games authors.

Supplied on cassette with a back-up option to disk, it is fully compatible with disks and with the 464/664/6128 machines.



Amstrad Machine Code THE EASY WAY

* SAVE £4 *

"Master Machine Code on your Amstrad" shows you how to make better use of your Amstrad by programming in machine code. This makes programs run much faster and opens the door to a host of new applications.

The book gives an overview of the hardware, and explains how the Firmware (ROM) routines are arranged, and how to access them. Details are given of the most useful of these and how you can use them in your own programs.

Many machine code listings are given, starting with a simple sorting routine which is developed to a full database program.

There are graphics routines to extend Basic with Circle and Fill commands, and a section explaining how easily you can write your own extensions to Basic using the 'BAR' commands.

Written with the beginner in mind, this book is the best introduction to machine code on the 464/664/6128 machines.

How to order

The normal combined retail price of these two products is £26.90. You can save £4 (mail order ONLY) by sending your cheque/P.O. for £22.90, made payable to SUNSHINE BOOKS to: Theresa Lacy, Sunshine Books, 12-13 Little Newport Street, London, WC2H 7PP.



01-437 4343

Micro Magic

Popular Computing Weekly

Micro Magic



The Amstrad CPC6128



Popular cassette labels

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

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

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

```

0 PRINT "Input your personal Micro
  Magic Number"
10 INPUT " "
15 FOR A=1 TO 3
20 LET A=A+1*(A-2)
30 LET A=A+2
40 LET A=A+3
45 NEXT A
46 PRINT " "
50 IF V=50000 THEN GOTO 80
60 IF V=100000 THEN GOTO 70
65 PRINT "Your matching Micro Magi
  c number is"
66 GOTO 60
67 STOP
70 PRINT "Your matching Micro Magi
  c number is"
71 PRINT "You have won an Amstrad
  CPC6128"
75 GOTO 70
76 STOP
80 PRINT "Your matching Micro Magi
  c number is"
81 PRINT "You have won cassette la
  bels"
84 GOTO 80
85 STOP
  
```

Micro Magic: Week 9 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: 515896 and 1387480

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

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

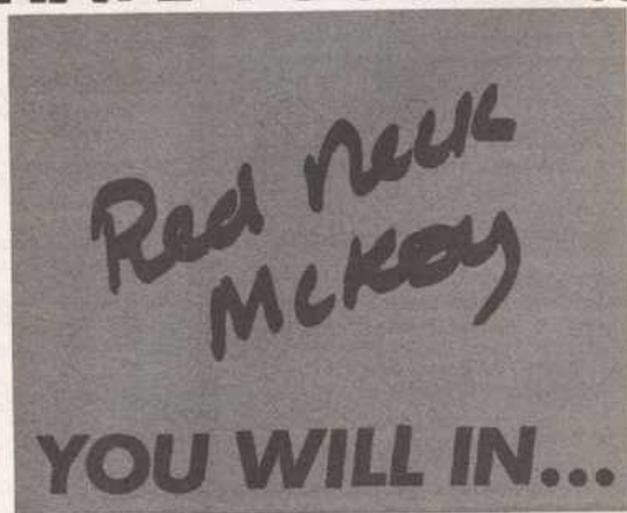
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SKYWAVE MULTI-PORT

Multiport is supplied with "SKYCOM", a menu-driven, window-based communications ROM package which will drive any standard modem, and lots more!! Other ROMs are scheduled for release soon!!

SKYCOM is a full "Foreground" ROM communications package, and runs without the use of BASIC, thereby releasing large amounts of RAM for the user. One benefit is a 32k+ Spooler.

Just see what the specialists have to say about Multiport...

"A product that should appeal to a large number of Amstrad Users." *Computing Age, Oct '85.*

"Includes the most sophisticated communications software available for the Amstrad." "Multiports sophistication makes it a very attractive product." "An excellent piece of kit." *Amstrad Action, Nov 85.*

Have you heard about "AMSNET", the NEW section on PRESTEL* 25886 # run by Viewfax just for Amstrad owners? Multiport

is the only interface which is Viewfax/Micronet approved. (granted 18/7/85) and you can download software using the telesoftware format developed by us in conjunction with Viewfax 258. This means that you can access the many free Amstrad programs currently on the system and all the other programs about to be put up.

If you have a PROTEK or AMSTRAD interface, or similar make of interface which will not download telesoftware, we are prepared to offer a generous trade-in deal against our Multiport and/or Modem Package. Do not miss out... Call our office for details!!

Multiport will also access Bulletin Boards, and Telecom Gold. An upgrade is available to permit access to the Open University System for use with O.U. Comms courses.

Multiport has many features, too numerous to mention in one ad., please call our office for an Information Pack to be sent to you.

Multiport is really 3 interfaces in 1... Its... A full RS232 Serial Port, a 24-bit parallel port, & a "Sideways" ROM card (takes 2 ROMs).

Modem Package deals are available for all popular modems and include Modem, Multiport, Manual and Connecting lead. From £ 129.95 all inc.

SKYCOM Communications Package

by David Husband

(C) 1985 Skywave
All Rights Reserved

Supplied strictly
Skywave Software

#>HELP

#>|

8 Characters

Auto L/F ON | E/S L
Printer OFF | E/S L
Xon/Xoff OFF | E/S L

Main Commands are:

TERMINAL (center)

PRESTEL (center)

GOLD (center)

KEY-PAD (center)

SKYTEL (center)

COMMANDS (center)

SET-UP (center)

"I" Commands Accepted

See Manual for more information.

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Skywave
SOFTWARE



A Nightingale or WS2000 Package is currently £ 169.95. If you already have a modem, Multiport is available for **£99.95** including Manual.

Our policy is of continuous development and support, and to this end, we have set up SKYCLUB on PRESTEL* 25886 # to support our customers with Multiport/SKYCOM. This is the first of a complimentary range of products based around the Multiport. Trade Enquiries: Modem House 0392 213355.

We normally operate a world wide return of post service for our mail order customers with credit cards, Access or Barclaycard. Cheques expect 7 days delivery. Please telephone our sales office for details (0202) 302385 or post the coupon today.

3-D plotter on Spectrum by Paul Rhodes

This machine-code routine produces a '3D' picture of the graph of a function. Whilst the program draws the graph fairly quickly, the user still has to set up the values to be plotted - a slow job even in machine code, as the pattern generator listed here shows.

The 3D effect is simple but effective, and is produced by using the value to be plotted as a displacement added on to the height of a point on a predetermined diagonal line. So if all values are 0, a parallelogram is produced.

Values to be plotted are stored in a table after the program - the address of the start of the table can be found by: `Peek 50998+256*Peek 50999`, and changing the values of these two locations will make the program use any area you choose for the table. The table consists of a 40*40 array: the first 40 bytes are the top line of the graph, the next 40 are the second line, and so on.

To enter the program, either use an assembler or type in the hexloader, enter C736 as the start address and C7C6 as the finish, and type in the bytes from the listing, up to eight at a time (not separated by spaces). Do not enter the checksums until asked for them. Save the code with: `Save "3Dplot" Code 50998,150`

To run the program: `Randomize Usr 51000`. The other listing can be entered

HEX LOADER

```

1 DEF FN B(A#)=CODE A#-48-7*(A#>"9")
2 DEF FN H(A#)=FN B(A#(1))*16+FN B(A#(2))
3 DEF FN B#(A)=CHR$(A+48+7*(A>9))
4 DEF FN H#(A)=FN B#(INT (A/16))+FN B#(A-16*INT (A/16))
5 POKE 23658;8:REM CAPS LOCK ON
10 INPUT "START?";LINE A#:LET START=FN H(A#)*256+FN H(A#(3 TO))
15 INPUT "FINISH?";LINE A#:LET FINISH=FN H(A#)*256+FN H(A#(3 TO))
20 FOR A=START TO FINISH STEP 8
25 PRINT FN H#(INT (A/256));FN H#(A-256*INT (A/256));
30 LET C=0
40 INPUT LINE A#:LET A#="A#+ "
50 FOR G=0 TO 7:IF A#(1)=" " THEN INPUT LINE A#:LET A#="A#+ "
60 LET Z=FN H(A#):LET A#="A#(3 TO):POKE A+G,Z:PRINT " ";FN H#(Z);:LET C=C+Z
70 NEXT B:INPUT "CHECKSUM:";LINE A#:IF FN H(A#)<>C-256*INT (C/256) THEN PRINT "CHECKSUM INCORRECT":GO TO 25
80 PRINT: NEXT A
    
```

HEX FOR 3D GRAPH PLOT, WITH CHECKSUMS

```

C736 CD C7 21 00 40 11 01 40 =47
C73E 01 FF 17 36 00 ED 80 D9 =C3
C746 E5 D9 11 CB C7 3E 28 12 =D9
C74E 2A 36 C7 2B 22 C9 C7 2A =2E
C756 C9 C7 23 22 C9 C7 7E 32 =15
C75E CB C7 1A 87 C6 44 86 47 =07
C766 1A 87 C6 13 4F 3E 28 13 =42
C76E 12 C5 D5 CD E5 22 D1 C1 =12
C776 2A C9 C7 23 22 C9 C7 3A =C9
C77E CB C7 3C ED 44 86 47 7E =47
C786 32 CB C7 0E 03 CD A0 C7 =06
C78E 11 CB C7 21 CC C7 35 2B =B7
C796 20 DE 35 C2 55 C7 D9 E1 =CB
C79E D9 C9 79 1E 01 CB 7F 2B =AC
C7A6 05 ED 44 1E FF 4F A7 20 =69
C7AE 02 1E 00 16 01 7B CB 7F =F9
    
```

```

C7B6 28 05 ED 44 16 FF 47 A7 =61
C7BE 20 02 16 00 C5 CD BA 24 =A8
C7C6 C1 C9 00 00 00 00 7C =06
    
```

HEX FOR 3D WAVE SET-UP, WITH CHECKSUMS

```

FF58 06 29 0E 28 C5 79 CD 28 =98
FF60 2D 3E 14 CD 28 2D EF 03 =93
FF68 31 04 38 C1 C5 78 CD 28 =60
FF70 2D 3E 14 CD 28 2D EF 03 =93
FF78 31 04 0F 28 A3 05 1F A4 =D7
FF80 A2 04 04 38 CD D5 2D C1 =72
FF88 2A 36 C7 11 28 00 A7 ED =FA
FF90 52 08 7B 19 3D 20 FC 59 =9D
FF98 19 08 77 0D 20 BE 10 8A =4D
FFA0 C3 38 C7 38 BD 36 FF 23 =0F
    
```

in the same way, using FF58 and FFA0 as start and finish. To run it (make sure you already have the 3Dplot routine in

place); `Randomize Usr 65368`.

After a delay of five minutes, a 'wave' pattern should appear.

Assorted Graphics Routines on Sinclair QL by Dave Barnett

Here are a selection of short graphics routines for the QL. None of them break new programming ground, but some of the results are quite interesting.

```

100 REMARK "circle",program by and Dave Barnett (1984)
10 PAPER 0:CLS
20 INK RND(255):PAPER RND(255)
30 CIRCLE RND(150),RND(50),RND(40),RND(4),RND(300)
40 IF RND<.95 THEN RUN
50 GO TO 120
100 REMARK "fig8",program by and Dave Barnett (1984)
10 REMARK After running the program,try changing line 120 to fill 0
30 FOR n=1 TO 255
40 INK RND (255)
50 LINE TO 100+40*SIN(n*2),50+40*COS(n)
60 END FOR
100 REMARK "flash",program by and Dave Barnett (1984)
10 CLS
20 INPUT "what resolution do you want (medium or high)";res:IF "m" INSTR res<>
OTHER MODE 255:ELSE MODE 512
30 PAPER 0:INK 7:CLS
40 INPUT "Do you want fill on or off ?(Y or N) ";a:IF a#="y" THEN FILL 1:ELSE F
IL 0
50 CLS:PRINT"Press (esc) at any time to exit program"
60 PRINT "After you have read the message press space to continue "
70 IF INKEY#<>CHR$(32) THEN GO TO 170
80 INK 7:CLS
90 CIRCLE RND(150),RND(50),RND(40),RND(4),RND(300)
00 IF INKEY#<>CHR$(27) THEN STOP
10 GO TO 180
    
```

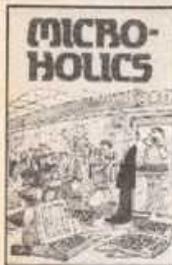
3-D Cube on Amstrad by Glen Campbell

This program calculates the rotation of a cube in 3D and projects it on to the screen in real-time. The maths is quite ingenious, but the screen does flicker as the cube rotates - however, the result is still quite nice. *n* governs the square size, *m* governs the speed of rotation.

```

10 INK 0,0:BORDER 0:DEG:MODE 2:ORIGIN 320,200:n=150:m=5
20 FOR x=0 TO 360 STEP m
30 a=n*COS(x):b=0:c=n*SIN(x)
40 d=-c*c/n:e=a:f=a*c/n
50 g=f:h=c:i=-d-n
60 CLS:INK 1,0
70 MOVE (a+d+g)/2,(b+e+h)/2:DRAWR -d,-e:DRAWR -g,-h:DRAWR d,e
80 MOVE (-a-d+g)/2,(-b-e+h)/2:DRAWR d,e:DRAWR -g,-h:DRAWR -d,-e
90 MOVE (a-d+g)/2,(b-e+h)/2:DRAWR -a,-b:DRAWR -g,-h:DRAWR a,b
100 MOVE (-a+d+g)/2,(-b+e+h)/2:DRAWR a,b:DRAWR -g,-h:DRAWR -a,-b
110 INK 1,26:NEXT x
    
```

Book Ends



Book Price
Micro Any
 £1.95
Supplier Unwin
 Paperbacks, 40
 Museum Street,
 London WC1A
 1LU.

A man stands by a micro with disc drives and printer, running a home computer accounts package. He holds a yard or so of printout and says to his wife, "Or in other words, we've spent a small fortune just to tell us we're broke."

Microholics is a collection of cartoons, some sexist, most unfunny, by Richard Howell who, according to the blurb, possesses an 'acute eye'. There's no hint of it here nor sign of the artistic talent.

Strangely, Mr Howell's 'jaundiced look' fails to see as far as opportunistic publishing like this, aimed fairly and squarely at the Christmas gifts market. The theory is that the non-computerate half

of the population will buy it for their micro-obsessed friends in the belief that they will find it funny.

I'm going to make sure my aged aunt knows not to, well in advance.

John Minson



Book Price
Peeks and Pokes for the Commodore 64
 £7.95
Micro C84 Supplier First Publishing,
 Unit 20B,
 Horseshoe
 Road, Horse-
 shoe Industrial
 Estate,
 Pangbourne,
 Berks.

That owners of the C64 have special needs for Peeks and Pokes, in particular those concerned with graphics and sound owing to the machine's inadequate Basic, is one of computing's great truisms.

This book, another of First Publishing's English editions of German Data Becker volumes, deals with these and many other reasons for directly addressing the micro's

memory. In fact, there's so much in its hundred odd pages, culminating in a machine code simulator and discussion of assembly language, that clarity is sacrificed.

Text which definitely reads like a translation plus transposed sections and typographical errors neither help nor instill confidence.

There are many other books which will fill the needs of the novice Pokes better, although it's just possible more experience programmers will find the odd useful tip here.

John Minson



Book Price
Graphics Programming Techniques on the Amstrad CPC 464
 £7.95
Micro Amstrad CPC 464 Supplier Micro Press, Castle House, 27 London Road, Tunbridge Wells, Kent.

Don't be put off by the fact that this book contains

rather a lot of listings; it's far more serious than it first appears.

Wynford James uses the listings to demonstrate various techniques that can exploit the CPC 464's graphics capabilities starting from Basic.

From the very beginning - the modes of screen display and ink colours - he uses examples and hands-on experience to illustrate the theory, and commendably covers relatively complex topics such as Fill.

He makes a logical progression through the problems and solutions involved in such topics.

There are chapters on shape drawing, animation, graphs and charts and pattern making, avoiding the old myth that graphics from Basic will let you create arcade games or artistic masterpieces.

It's a much more practical approach that will teach a good deal of programming technique.

John Minson

Code Words

Name: Sandy White

Author of *Ant Attack* and *I, of the Mask*

I used to build electronic projects in magazines and when the Sinclair Mk 14 came along I built that - my first computer.

I learnt to program using the manual supplied with it - it was awful! The Mk 14 used a simple National Semiconductor chip and so when the Z80 came along it looked horribly complicated as did Rodney Zaks' book - it was so thick!

I think the best advice for anyone who wants to learn about machine-code pro-

gramming is to begin with just a few simple instructions - gradually try a few more as you need them. It's useful to have someone who already knows a bit of code around to help. Despite its difficulty I'd say the Rodney Zaks' book on the Z80 is a vital purchase.

I don't really use any utilities, I have a *Picturesque Assembler* but don't use it much. More useful is networking Spectrums together to keep the code secure. I also have a hex development system which puts in the code as a memory map and is thus crash-proof.

I don't really play other people's games so I can't comment technically on their work but I do like Jeff Minter.

I think my own greatest achievement was to create a full screen of solid perspective graphics and move them around at ten times a second. My ideal program, my ambition if you like, is a development of what I've already done it would be like looking at reality as filmed by a roving video camera that you could control.

Name: Sandy White

Age: 25

Favourite Programs:

I can't think of any games I really like although I have lots of them. The only exception is *Scrabble* - I set it to play against itself and watch it make crosswords. I like and use *Melbourne Draw* a lot.

Favourite Machines:

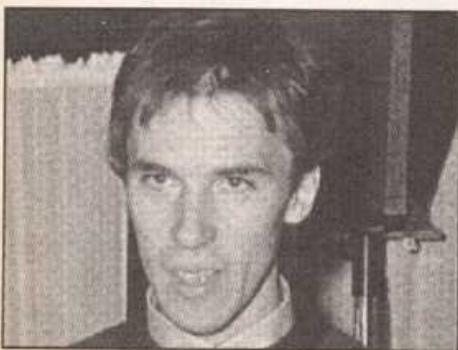
I think my favourite machine is the Amstrad just because it's a complete package and has decent sound. I have a couple of Spectrums and look forward to the 128K especially because of the Midi. I also use a Commodore 64 with a Midi package.

Software:

3D Ant Attack, *Zombie*, and *I, of the Mask*.

Hobbies:

Music: I have a DX 7. I play the drums and have fantasies about being a pop star, but I can't play it properly, only by programming music via computer. I also like chemistry, blowing things up and making nasty smells. I also make films - at one time I used to enter them for a children's program called *Screen Test* but they'd always send back a form letter telling me to use a tripod or something. Actually I always did use a tripod, I think it was the chopping people's heads off and spurts of blood from squeazy bottles that caused the problems.



MAKE MONEY WITH YOUR MICRO!

you could earn over £50 per week-in your spare time-and you don't need any special programming skills...

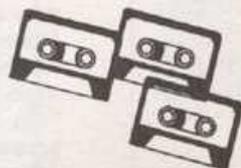
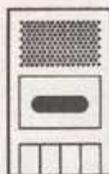
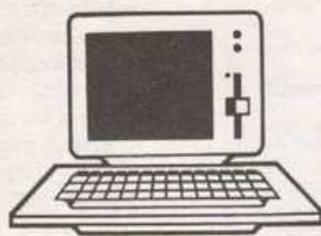
Although you may at present only use your micro to play games, your computer is in fact a very sophisticated business machine which you could use to make yourself a very substantial full or part time income. Whatever your age opportunity exists. You may be a schoolboy looking for a school business project. You may have left school and be looking for a viable business idea. You may have a good job, but you would like to have an extra income. Whatever your circumstances, if you want to make some money, you can turn your micro into a money making machine.

FORGET ABOUT GAMES

Of course it is possible to make money as a games designer, but unless you understand machine code, and have lots of original ideas, you might as well leave games designing to the professionals. After all games design is a very competitive area, and there are lots of easier ways to make money with your computer.

HOW TO GET STARTED

We have compiled a special report which provides you with all the information you need to start a small part time business, which you can operate from home, using your micro. The report contains hundreds of business ideas which give you the possibility of earning thousands of pounds from your micro. Each idea is explained in detail, you need only the simplest of programming ability, if you can write simple basic programmes you can operate any of these ideas. (When we say simple basic programmes we mean very simple) some of the ideas require no programming but even the ideas that have the greatest potential are very simple and easy to operate.



ANY COMPUTER WILL DO!

Whatever your micro, Spectrum, Commodore, Electron, Amstrad etc. all the business ideas in this report are applicable to all home micros, no matter how humble or sophisticated.

TRY THIS SIMPLE TEST

When the report arrives select one idea that appeals to you.

Try out the idea for three months, read the directions carefully, start in a small way, remember to begin slowly.

At the end of this trial period calculate how much income you've made, if you're not satisfied with the results simply return the report and we will **REFUND YOUR MONEY IN FULL.**

You are free to use each idea, to establish your own part or full time business. All the ideas are viable business opportunities, which don't require any special expertise or skill, just a few hours of your time each week can bring you an income of £50 or more. Many of the ideas are capable of development to provide you with a very substantial income indeed, and each idea will grow and develop as you operate the business. The business you start will be totally your own and can be started with just one micro, and perhaps £5 or £10 start up expenses.

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Starion kips

To start off this week here, as promised, is the invincible man routine for *Fairlight* from Chris Allen. To use it type in the code, wind the original game tape past the first header of the first program (ie, the part that prints FL on the screen). Run the program you have typed in and start the tape when it tells you to. The program uses the screen at some points so don't worry about the blue border or the mess that you see.

Four sectors

Now then, I must thank everyone for all the help they gave in response to our pleas for *Starion* tips. It isn't really worth anyone else sending any more in for a while. I am hoping to dedicate a special issue of the Avenue to the new games from Melbourne House, which seem to be getting better and better including *Starion* and the tips you have sent in for *Fist*.

I've thought long and hard about the *Starion* tips. I don't want to give much away since solving the anagrams does a lot to stop the game from being just another boring

shoot up, but it can be extremely frustrating if you pick the wrong time zone with your hard won word and have to fight your way out again. For now we will restrict the answers to just the first four sectors to make sure that people can get started.

Sector 1 - Redbreast

Asprin - 1893
Telegram - 1858
Starion - 1985
Electricity - 1831
Bible - 1968
EEC - 1957
Diamonds - 1897
Reativity - 1905
Rhodesia - 1980

Sector 2 - Spacewalk

Coal - 1764
Krakatoa - 1883
Preface - 1086
Leonov - 1965
Armada - 1588
Axe - 1587
Seal - 1764
Egbert - 0814
Wellington - 1815

Sector 3 - Establish

Treaty - 1919
Atom - 1942
Hitler - 1924
Spectrum - 1982
Ivan - 1547
Ballast - 1783
S - 1901
Lamp - 1889
Eiffel -

Sector 4 - Parachute

Avon - 1983
Tobacco - 1565
Umbrella - 2222 BC
Rubber - 1888
Penny - 1840
Cakes - 1789
Halley - 1986
Aerial - 1896
Everest - 1953

Anthony Torak of Leicester has written to claim to be the

first to reach Elite status on the Commodore version of the game. We certainly haven't heard of anyone else doing so but probably only Firebird can say for sure.

Brilliant kick

Anthony offers some tips on the game, which we would be grateful for particularly now that many more people will be playing it, but the same applies to anyone who is doing well with the game. We would be most interested in tips about the new aspects of the different versions since the BBC copy has been around for some time.

Thank you all also for your *Blackwyche* tips and these too will go into a special column dedicated to the game. Darren Riley is one of those who has written in but he also has some more special codes for the CBM version (and perhaps others) of *Bounty Bob*. "On the game adjustment screen enter 57502 and then press 'A' and F3 together. You can then play the game as normal or you can go to any screen you wish to by typing the number on the keyboard. For example '21' takes you to screen 21 and '09' takes you to screen 9. You can wrack up massive scores this way. Other codes to try are 5, 6, 40, 49, 69, 100, 66, 815, 1000, 2049 (surprise surprise!). You just press F3 to activate them. My high score without cheating is 91890 on screen 10."

This thing with *Bounty Bob* strikes me as a brilliant trick, it doesn't make it too easy to

cheat since there is still a challenge to find all of the codes but it still means that ultimately everyone can get to see all screens.

While on the subject of platform games Stephen Trill of Sidcup wants tips and pokes for Mirrorsoft's brilliant *Dynamite Dan*. It's quite a relief now that platform games are beginning to drop off in number to see that good new versions of the idea are still possible. D Moison of Jersey asks if it is possible to actually rescue Esmeralda on the Amstrad version of Ocean's *Hunchback*. Well, you can't on the Spectrum version but as people have complained in the past I did hope Ocean may have added this to new versions.

Record times

Another Ocean game, *Decathlon*, is the subject of a letter from Jason Hall who tips that you can get record breaking times by jiggling two joysticks at once. Of course the presence of a close friend helps here.

Finally here's a letter from Brian Thompson of Beckenham who has completed the CCS wargame *Arnheim*. We occasionally get wargame letters full of long complicated solutions but no one here quite knows what to do with them.

They don't fit into the arcade or adventure columns as they stand, so I'm throwing this open to the readers. Let *Popular* know if you would like wargames covered.

Tony Kendle

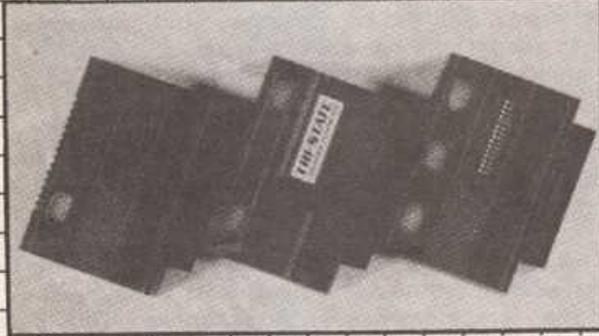
```

1 REH      ** FAIRLIGHT INVINCIBLE MAN **
2 REH
3 REH      * HACKED BY CHRIS ALLEN *
4 REH
5 REH      ...NOTHING IS IMPOSSIBLE!...
7 LET B=0
8 CLS
10 FOR T=0 TO 217:READ A:POKE (T+16384),A
20 LET B=B+A:NEXT T
30 IF B<23495 THEN PRINT "ERROR IN DATA":STOP
40 PRINT AT 19,48:"Play the tape."
50 RANDRIZE USR 16569

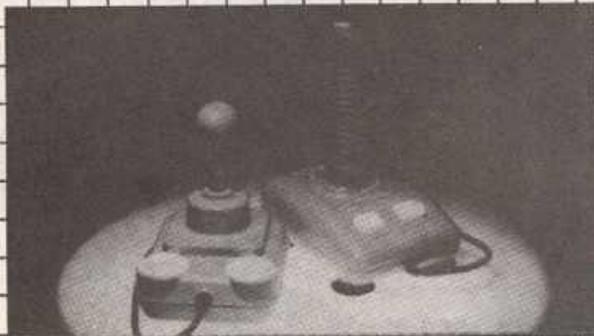
100 DATA 221,33,40,209,17,0,176,33,40,209,1,18,12,26,172,173,170,171,221,119,0,201,35,19,35,11,100,177,35,239,49,200
101 DATA 90,221,33,174,210,35,0,69,221,126,0,119,254,195,40,111,254,95,40,33,254,32,32,24,33,221,33,221,126,0,119,254
102 DATA 224,55,13,221,229,35,54,201,200,0,69,221,225,33,205,68,221,35,35,24,211,221,126,205,254,237,32,244,42,136,64,35
103 DATA 34,136,64,6,9,221,33,16,252,126,42,1,69,237,75,4,69,245,241,245,174,119,35,11,241,196,9,203,191,245,120,177
104 DATA 32,240,241,33,0,69,24,160,137,64,30,17,46,41,107,7,37,38,100,62,34,3,43,19,85,120,9,11,23,25,79,33
105 DATA 33,0,34,200,220,33,0,34,34,202,220,33,231,241,34,204,220,62,201,50,206,220,173,225,218,221,33,203,92,17,93,5
106 DATA 62,205,55,205,86,5,33,15,245,34,26,97,33,129,122,34,39,97,62,203,50,41,97,193,130,194
    
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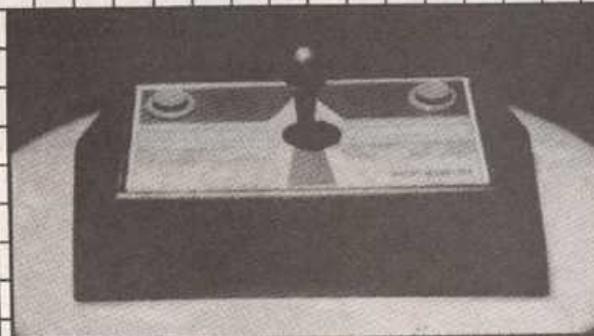
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Tony Bridge's Adventure Corner



Deflated

Melbourne House and Adventure International are two of the biggest adventure-writing outfits around at the moment, and much of their success has been gained by taking themselves very seriously in the market-place. Their programs are very clever and can certainly stand a little deflation.

Which is where Delta 4 and Silversoft come in: *Sherlock* and *Robin of Sherwood* are good candidates for a bit of gentle leg-pulling, a challenge very quickly taken up by Fergus McNeill and all the other loonies at Delta 4.

One can only guess at what goes on in a mind obsessed with Penguins and Judith (I haven't met any penguins, myself) but as long as it keeps coming up with parodies such as *Bored of the Rings* and now *Robin of Sherlock* who are we to argue? The Jester with his henchperson, The Desperado, has once again turned from thoughts of fish to extracting the Michael from respected adventures.

There's a certain atmosphere present in all Delta 4 (now marketed by Silversoft) adventures - the player has the definite feeling of being followed, if not by a slaving ghoul, at least by a laughing clown. The puzzles included

in the typical Jester adventure are not mind-searing, but rather giggle-provoking, and those met in the present program are more of the same: hardly demanding, but nevertheless interesting and creating echoes of other, maybe more well-known adventures.

The location descriptions are also in the usual McNeill mould - right at the start, for example, you'll find that good old Friar Gorbachetnik succumbs to a surfeit of Venisonburgers in a rather spectacular fashion (resulting in 'lots of bits of Friar!'). Not far from here lies the Kentucky Fried Squirrel House, with copious amounts of Squirrel 'n' Fries (but no Penguinburgers), and a definitely dodgy Convent (don't forget to get the habit!).

On and Off

Robin of Sherlock is *Quill'd*, *Illustrated* and *Patch'd* (all acknowledged, I'm glad to say) and thus features good split-screen graphics/text, weird sound effects and the very useful Ram save and load - so progress is very quick. Particularly as the graphics can be switched on and off at will and, anyway, pictures are only drawn on the first visit to a location (unless otherwise instructed).

With the rustic character set and the good use of colour, this is an attractive adventure to play - as I've said, the puzzles are not numerous, and neither are they particularly taxing, but there are many useable objects, and these will keep you occupied for some while. Characters, unusually for a *Quill'd* game, carry on their own existence (it says here), and you are encouraged to indulge in deep conversation with them. Here is the joke at the expense of *Sherlock* - charac-

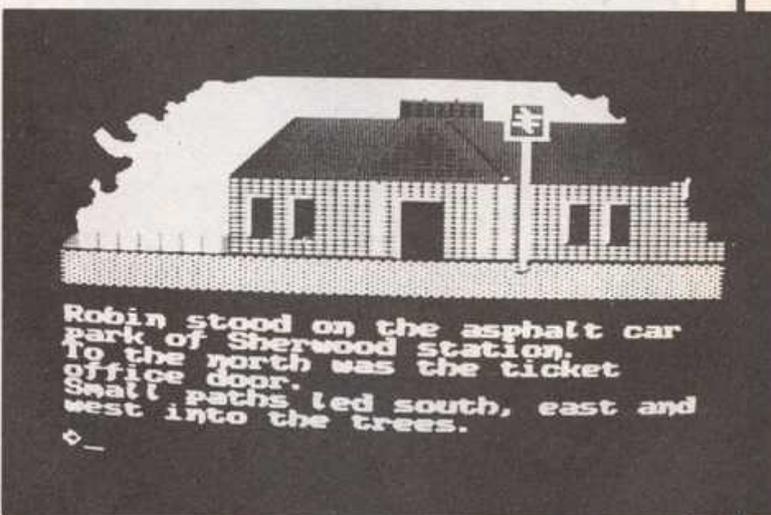
ters may be asked to supply their alibi or to split on another character, but there seemed to be a standard, non-helpful response to my questions, and much of the character 'interreaction' seemed to consist of Dorothy (her from *Wizard of Oz*, don't ask me why) or Marion wandering in and out of the scene. However, it should be possible to ask them about a certain aspect of the adventure, although you run a good risk of getting your ear chewed off for your pains!

The adventure is very pretty, though, with a nice character set, occasionally highlighted in cyan, contrasting with the normal white-on-black. The graphics are quickly-drawn, with much use of repeated blocks (sub-routines as experienced *Illus-*

receive the regular newsheet (rather like a school magazine sent out to old pupils) from this establishment which is for the education of, it seems, rather mature gentlewomen. It's actually an extreme form of torture which said mature gentlewomen submit themselves to as their ideal of a way to spend a holiday, and pretend that they are back in the '30s.

Black on cyan

The Secret of St Bride's is the latest software product of the school, and it's been well received by many magazines. I've just had my first glimpse of the adventure - pretty standard *Quill'd* and *Illustrated* stuff, with a nice black on cyan layout and objects picked out in light col-



Robin of Sherlock from Delta 4

trators will know them) and as there isn't much shading, the whole process is nicely speeded up.

A good laugh

Delta 4 adventures all suffer from the author's devotion to style rather than content: absolutely nothing wrong with this approach as long as you want a good laugh and a few rib-nudging references to some of the old favourites - a good time be had by all, but don't expect brainteasers of the Level 9 standard.

While we're wandering about in this neck of the adventuring woods (the 'let's treat this thing as a lark' neck), let me mention that dubious seat of learning in County Donegal, St Bride's School. I'm always glad to

ours. You wake up one morning in your dorm, along with the other girls, only to find that the others, dotty as they are, seem to believe that they are actually living in the 1930s - you know of course that this is actually the 80s, so what is going on?

Being a good adventurer, you must find out *The Secret*... By examining everything, many objects will be found and then it is a matter of finding the right place to use the objects. So the adventure can be worked through quite logically, with not too many big surprises. And, thanks to Audiogenic's influence, the program is implemented quite professionally.

I look forward to the next adventure from St Bride's, if only to see another of its bizarre press releases!

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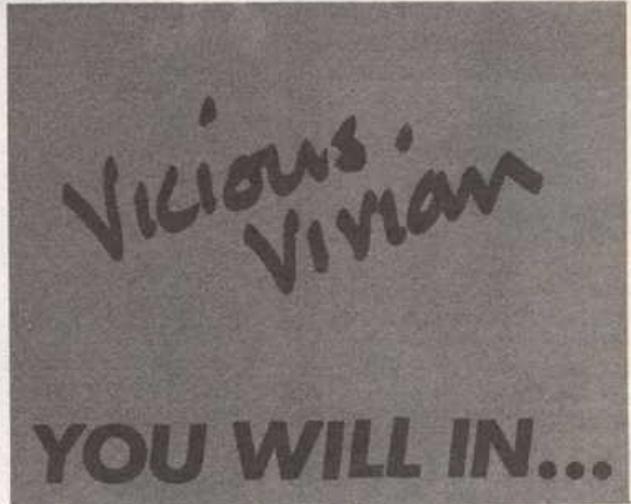
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Peek & Poke



Kempston compatible

Colin Watts of Newcastle upon Tyne writes:

Q Is the Spectrum + up-grade kit compatible with a Kempston joystick, on an issue 2 Spectrum, as I have heard there may be a problem?

A All the connection problems with the plus are caused by the interface slot being 'guarded' by a lightly raised portion of the keyboard casing. In order to check whether your existing interfaces will fit into the new slot, it should only be necessary for you to look closely at the back of a plus. In terms of other types of compatibility, I have not heard of any problems with it.

Language programming

S A Taheri of Canterbury, Kent, writes:

Q I have recently obtained a degree in Maths, Stats and Computing, and I would now like to buy a computer to do language programming (Pascal or Fortran).

I can spend up to £1,000, including a printer and monitor. Could you help me find something suitable?

A There are not many Fortran packages produced for the home micro market, but there are Fortran implementations which run under CP/M.

Amstrad's CPC 8128 is CP/M compatible. The micro costs £299 complete with disc drive and monochrome monitor, and £399 complete with disc drive and colour moni-

tor. Amstrad's DMP 2000 printer costs just £159, so you would be well within your price limit.

Commodore's new 128 machine will also run CP/M programs, but ideally you will need its new 1570 disc drive and 1901 80 column monitor. Neither of the latter are yet available, but have been promised before Christmas. For the 128, 1570, 1901, and Commodore's own printer, the MPS 801, expect to pay just under £1,000.

Interestingly enough, there is a Fortran program for the Sinclair QL which doesn't need CP/M. It is from Prospero Software at 190 Castlenau, London SW13. A QL would cost £199, and Sinclair's own monitor £299.

Two printers which can be used are Mannesmann Tally's dot matrix (with centronics interface) at £250, or Brother's HR5 (RS232 interface) at £157. There is a comparatively large number of languages available for the QL, particularly from Metacomco and HiSoft.

Implementations of Pascal can be found for almost all home micros.

Disabled keyboard

Pamela Sellick, of Abingdon, writes:

Q I have a Spectrum approximately 18 months old. After being on for a short time, the keys in the end columns cease to work. Gradually the other keys also fail. Switching the computer off for a while seems to temporarily remedy the problem. I would like to know whether the problem would disappear by fitting one of the new 'official Spectrum upgraders' to turn the machine into a Spectrum Plus. If not how can the computer be repaired?

A It sounds to me as if the fault lies in the keyboard membrane, which sits underneath the rubber keypad. It would seem as if this has split or worn in such a way that when the machine heats up the connection(s) are broken, thus effectively disabling your keyboard!

The Spectrum up-grade, as it involves fitting a new membrane (owing to the different keyboard layout), should indeed cure your problem.

Dragon repairs

A T Edwards, of Ystradgynlais, Powys, writes:

Q While loading a program into my Dragon 32 it suddenly crashed, after leaving the din plug in the socket I turned the machine on and off. This resulted in a screen with characters strewn all over it. Many attempts to clear the screen have failed.

Do I require a new chip? If so do Dragon Data do such repairs, if not where can I get it repaired?

A It sounds to me as if you need a new something, but exactly what is difficult to determine. I think that if you asked Dragon Data about repairing your machine you might have a long wait for an answer!

You could try a firm called Mi-Crowe of 49 Wykenham Road Drive, Basingstoke, Hants RG23 8HW (0256 23858). They repair Dragon 32's for £15 plus the cost of parts. Alternatively, try Compusense, PO Box 169, 286a Green Lanes, London N13 5XA (01-882 0681).

Screen messages

I Stokes of Rhyl, Clwyd, Wales, writes:

Q Can you please tell me how to eliminate Program name or Bytes name appearing on the screen? I have assembled programs with a Screen picture only to find that when the next part is loading I get these messages displayed across the screen. I have tried to fill the screen with Print statements but to no avail, since it then scrolls the screen up to put out the message. Is it possible to change its colour? I own a Spectrum.

A One very simple way is not to print on the bottom

line of the user screen, but to issue a *Print At* statement for line 21, column 32 (*Print at 20,31*). This has the effect of forcing the message to be printed on the 22nd line of the screen.

Then by setting *Ink* to be the same colour as paper, you will achieve the desired effect without scrolling. It must be remembered that the *Print At* statement must be executed before each *Load* statement.

Lynx characters

Terry Stevens of Plymouth, writes:

Q Firstly, I own a Lynx (remember them?). I want to be able to display large characters on the screen (two or even three times normal height.) Is there any way that this can be done?

As you can imagine it's not easy to find much information on my machine these days.

A I may be able to help you here. VDU24 and VDU25 will give you double height characters. For even large ones try *Poke & 6273,96* (*Poke & 6273,32* puts things back to normal).

Screen copies

M Payne of Coventry, writes:

Q Is there a way of getting a full screen copy of any picture? If you load in a commercial tape, eg, *Lunar Jetman*, you then have to *Break to Copy*, which then loses the bottom few lines.

A Firstly, I guess that you have a Spectrum. Secondly, try this:
10 LOAD "" SCREEN
20 COPY

When this Basic program is entered and *Run*, it will search a cassette for a screen picture, which when loaded is then dumped to the printer (intact).

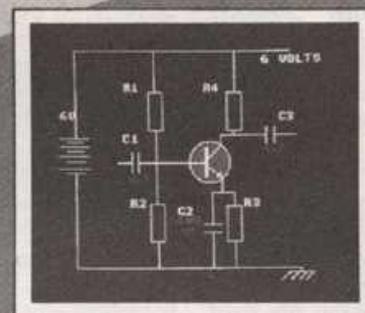
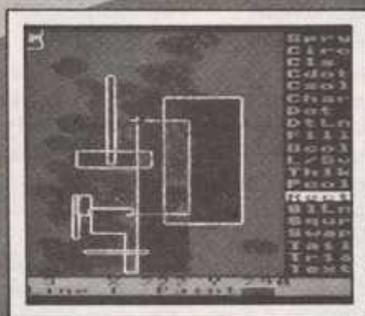
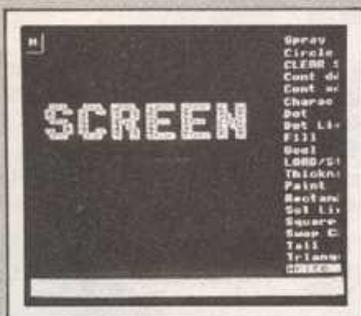
If you want to copy to cassette, then use *Save "" Screen* instead of *Copy* on line 20.

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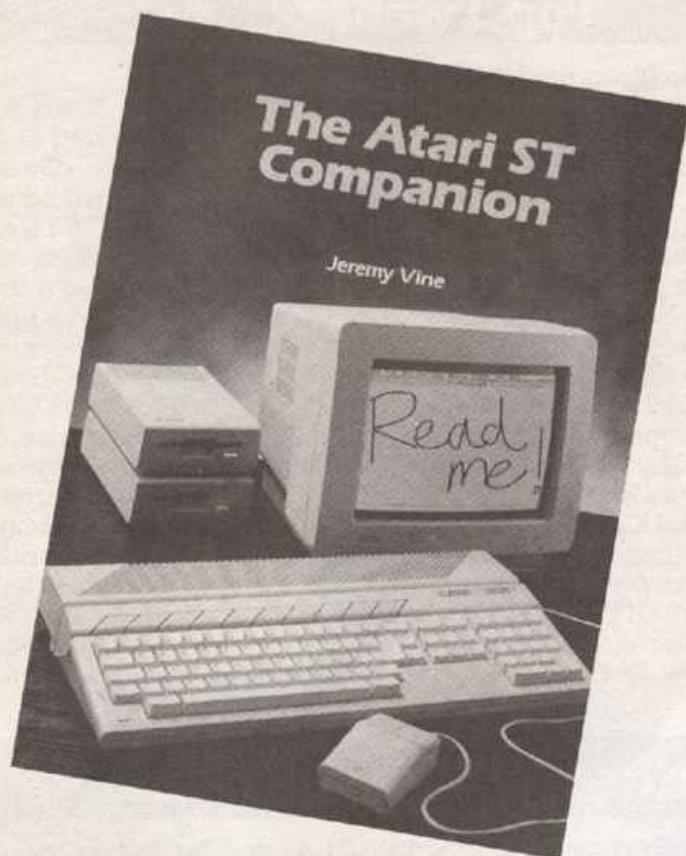
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Commodore 64

| | | | | |
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Spectrum

| | | | | |
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| 1 | (-) | Commando | (Elite) | £7.95 |
| 2 | (1) | Elite | (Firebird) | £14.95 |
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Bubbling Under

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

All figures compiled by Gallup/Microscope

Top Twenty

| | | | |
|----|------|--|---------------------|
| 1 | (-) | Commando (Spectrum/C64) | Elite |
| 2 | (1) | Elite (Spectrum/C64/Spectrum) | Acornsoft |
| 3 | (4) | Winter Games (C64) | US Gold |
| 4 | (-) | Rambo (Spectrum/C64) | Ocean |
| 5 | (3) | They Sold A Million (Spectrum/C64/Amstrad) | Hit Squad |
| 6 | (-) | Fight Night (C64) | US Gold |
| 7 | (2) | Formula One Simulator (Various) | Mastertronic |
| 8 | (-) | Tomahawk (Spectrum) | Digital Integration |
| 9 | (8) | Computer Hits (10) (Various) | Beau Jolly |
| 10 | (16) | Back To Skool (Spectrum) | Microsphere |
| 11 | (6) | Way Of The Exploding Fist | Melbourne House |
| 12 | (11) | Beach Head 2 (Spectrum, C64, Amstrad) | Access/US Gold |
| 13 | (5) | Finders Keepers (Spectrum, C64, Amstrad) | Mastertronic |
| 14 | (10) | Monty On The Run (Spectrum/C64/Amstrad) | Gremlin Graphics |
| 15 | (10) | BMX Racers (Spectrum, C64) | Mastertronic |
| 16 | (15) | International Karate (Spectrum) | System 3 |
| 17 | (12) | Frank Brunos Boxing (Spectrum, C64, Amstrad) | Elite |
| 18 | (9) | Action Biker (Spectrum, C64) | Mastertronic |
| 19 | (-) | Arcade Hall Of Fame (Spectrum, C64) | US Gold |
| 20 | (7) | Robin Of The Wood (Spectrum, C64) | Odin |

Figures compiled by Gallup/Microscope

Readers' Chart No 53

| | | | |
|----|-----|--|--------------------|
| 1 | (1) | Way of the Exploding Fist (Spectrum/C64/Amstrad/Melbourne House) | Melbourne House |
| 2 | (2) | Fairlight (Spectrum) | The Edge |
| 3 | (3) | Hypersports (Spectrum/C64) | Imagine |
| 4 | (5) | Monty on the Run (Spectrum/C64) | Gremlin Graphics |
| 5 | (4) | Red Moon (Spectrum/C64/Amstrad/BBC/Electron) | Level 9 |
| 6 | (-) | Elite (Spectrum/C64/BBC/Electron) | Firebird/Acornsoft |
| 7 | (6) | Nightshade (Spectrum) | Ultimate |
| 8 | (7) | Spy vs Spy (Spectrum/C64) | Beyond |
| 9 | (-) | Daley Thompson's Supertest (Spectrum) | Ocean |
| 10 | (-) | Flight Simulator II (C64) | Sub-Logic |

Winning Phrase No 53: "Why do I try? I fail so often" from Darren Gregory, Bispham, Blackpool, Lancs who receives (to his surprise no doubt) £25. Honourable mentions to Andrew Gallagher of Altringham, Cheshire with "Who has tight fist on Soft Aid?" and Andrew Toy of Crawley, Sussex with "Terry Wogan raises lots of gelt".

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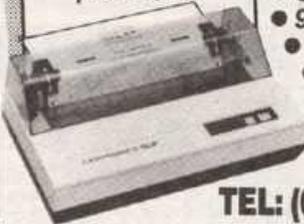
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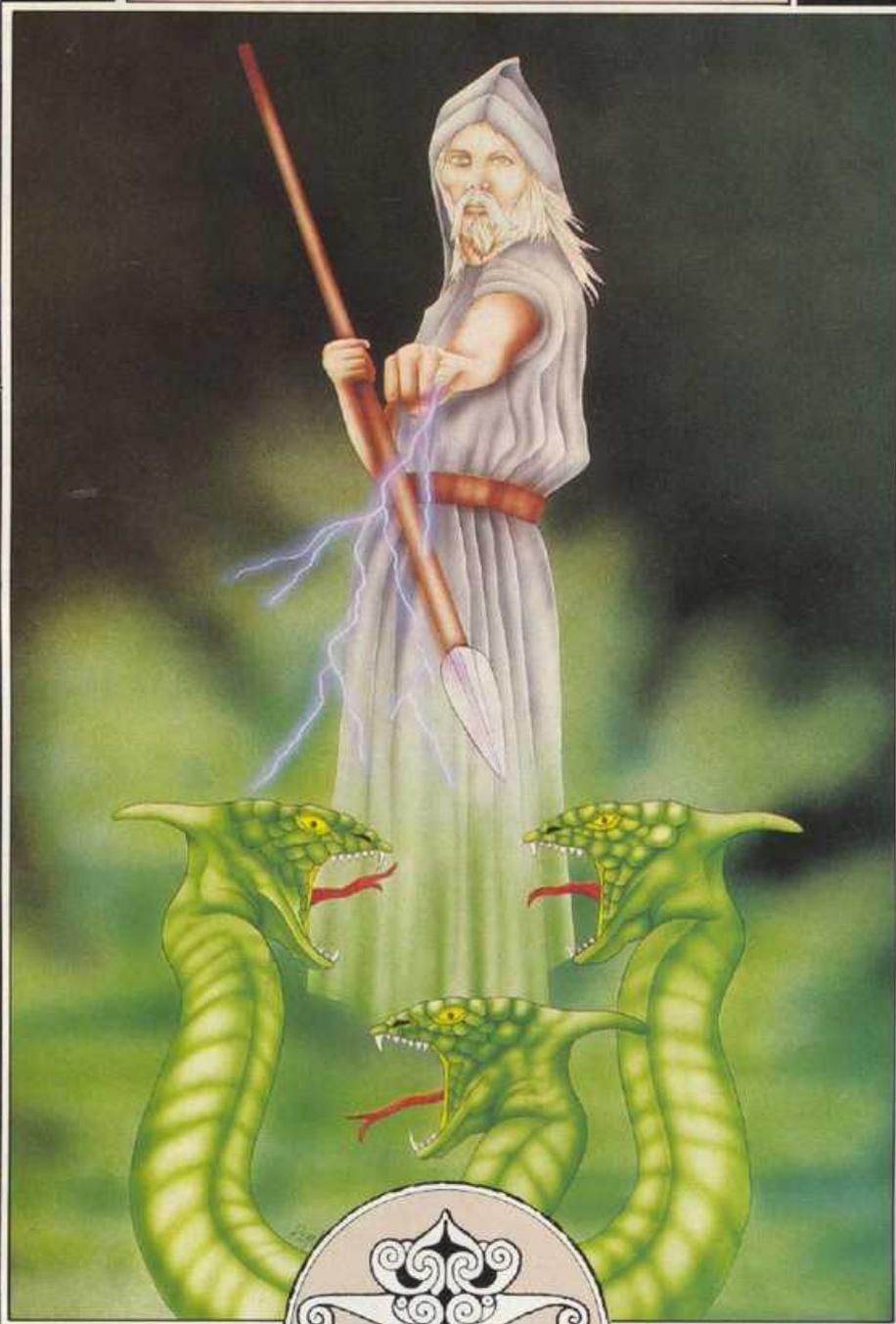
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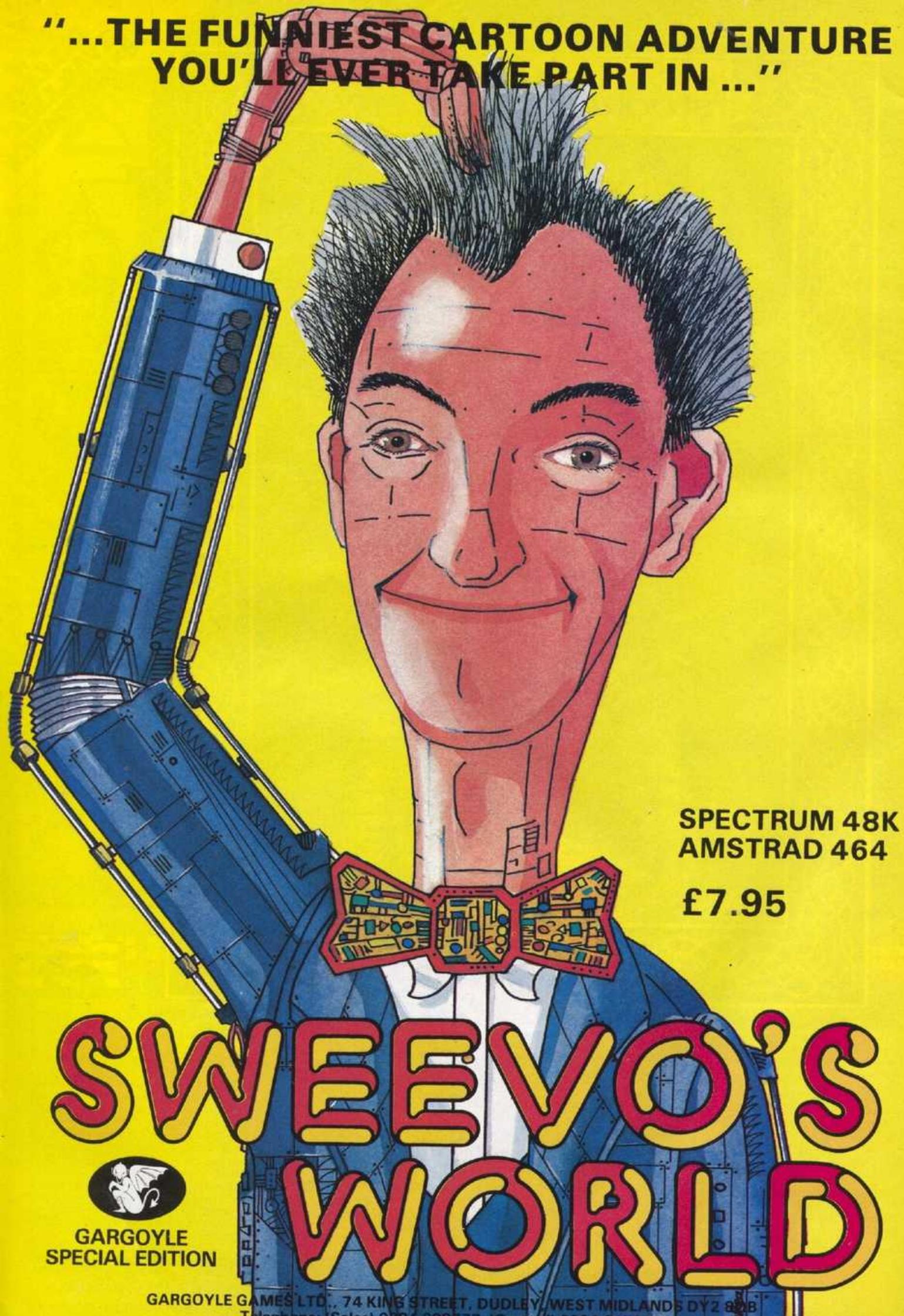
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I particularly liked *Paradise in Microdot* which is one of the more bizarre adventures I've ever played, and *Pi in the Sky* is the sort of enter-

taining arcade game that exemplifies what a budget game ought to be.

A good choice for uncertain aunts who don't know what program to buy for computer-owning relatives, or for those who've just bought a Spectrum and want a lot of material quickly.

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GRAND SCALE

Tombstowne, the latest Amsoft release, is a multi-screen large sprite game broadly in the style of some of Mikro-Gen's recent *Wally* games. The task is to rescue the lost pages of the book of spells from the Castle.

Getting the pages involves finding your way around the various rooms of the castle and finding and using a variety of objects.

The graphics are, in places, excellent; almost *Sorcery* like in detail and design, on the other hand sometimes when sprites pass one another you get what almost seems to be attribute problems - a nasty flicker effect.



In some ways this is like *Manic Miner* played on a grand scale, but with the bonus of some intelligence being required to know what to do where to get from one room to another. My criticism would be that the game lacks a certain spark.

Perhaps that's an overly personal judgement, though, which comes from seeing too many such games. Worth a look for sure.

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Price £8.95
Micro Amstrad
Supplier Amsoft
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RIGHT LEVEL

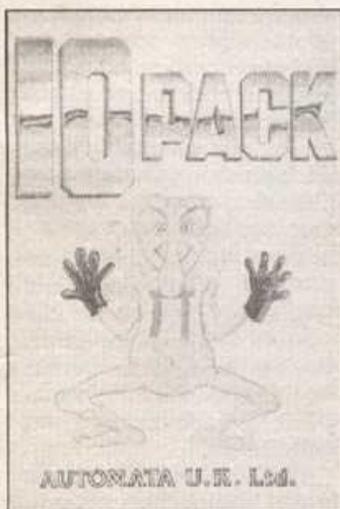
Versions of, well let's be careful and say games like *Trivial Pursuit*, since TP isn't the only grand quiz game, are beginning to crop up on computer. Mostly they are dire.

One that isn't dire, although it still suffers some of the basic failing of this sort of computer replication, is *Quiz Quest* from Alligata Software. It's neatly presented and easy to use and, best of all, the questions seem to have been set at the right level for averagely well informed (British) adults - you have to stretch your brain a bit.

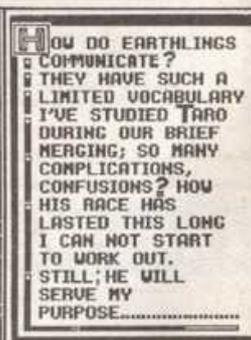
The basic idea is simple, a main program to handle the presentation and then a number of files on tape contain 1,000 questions on pop, TV, general knowledge and sport etc. Questions are answered using a multiple choice format and there is a facility to enter your own files.

As quiz programs go this is one of the best, though for what it's worth I think I prefer question cards over computers every time.

Program *Quiz Quest*
Price £4.99
Micro Amstrad
Supplier Alligata Software
 1 Orange Street
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The Rogue Program



New Releases

À DROITE

More goodish educational software from Chalksoft. After their excellent economy simulation disc comes *Centre Ville*, a disc based French language teaching program. Actually it is three programs in one, all intended for beginners in the language.

Centre Ville, the title game, is all about issuing simple direction instructions to the hapless M. Chou who comes to Centre Ville sans map and who wants to visit just about every sight in the town. If M. Chou were for real I think I'd have murdered him pretty quickly; his chirpy smile and waving hand remind me of those born-again Christians who try to stop you in the street.

Nevertheless, in issuing M. Chou with his instructions, quite a lot of French is tested and surreptitiously taught. Using a menu option, where a large number of directions indications are printed (in

French), M. Chou must be guided around the streets of Centre Ville, eg, go straight on, turn right, straight on, turn left, etc, etc.

Get M. Chou to his chosen destination and there he is grinning inanely at you. It isn't only a matter of getting the directions right, you also have to be as economic as possible in your directions - the less commands the higher the score - this, of course, means knowing your French.

The other programs are concerned with colours and telling the time; both are well designed and neatly presented but, for me, lack the unforgettable quality of M. Chou and his interminable requests for information.

Program *Centre Ville*
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Spalding
Lincs PE11 1NZ

EXOTIC BUGS

The Young Ones has been turned into a computer game. Impossible, you say?

Yep, dead right; Orpheus has tried it, and what a mistake it has turned out to be.

Here are the good points: it does feature little animated figures who look vaguely like the characters in the TV programme and Orpheus seems to have spent a lot of time trying to inject wild wacky anarchic humour into the game. I mean, Neil begins all his utterances with 'Oh Man' and Rick uses the word 'girly'



Pick of the week

CLASSIC VIRTUES



Ariolasoft's most recent release *Think!* is the sort of program you might easily miss or ignore.

Not an arcade game or an adventure, almost totally lacking in animation, it is a board game for the computer. A board game in the sense that you move pieces on a board which is a six by six grid of squares and where the kind of strategy, brains and cunning you might use in chess are paramount.

The virtues of *Think!* are really nothing to do with computers or computer programming, it is simply a wonderfully addictive and ingeniously designed game. It has dim connections with *Connect 4* but only in terms of the overall objective - to get four pieces in a row either vertically, horizontally or diagonally.

Pieces are placed, turn by turn, on either the bottom or right-hand edges of the board, existing pieces in the same row or column are moved along one space as each piece is placed. It has the classic board game virtues - simple rules which can nevertheless lead to astoundingly complex board positions. Frowned brows and intense concentration required.

The game is nicely presented, with hint and puzzle-solving options, record of moves made, instant replay and a host of different

display options. You can, of course, play against the computer and at the highest levels it will show you it thinking, by a flashing cursor that whizzes around the perimeter of the board indicating possible moves. The Spectrum, is, at the highest levels, almost unbeatable (that 'almost' is important - so far as the authors of the game know, there is no logical, algorithmic reason why the computer should be unbeatable).

The ideal program with which to intimidate the family at Christmas.

Program *Think!*
Price £7.95
Micro Spectrum
Supplier Ariolasoft
Asphalte House
Palace Street
London SW1E 5HS

This Week

| Program | Type | Micro | Price | Supplier | Play and Read | Ed | Price | Supplier |
|----------------------|------|---------|--------|--------------|----------------------|-----|--------------|----------|
| Deathwake | Arc | Amstrad | £7.95 | Quicksilva | The Worm in Paradise | Ad | BBC B | £28.95 |
| Renegade | Arc | Amstrad | £7.95 | Kuma | Deathwake | Arc | Commodore 64 | £9.95 |
| Strangeloop | Arc | Amstrad | £8.95 | Virgin Games | Fight Night | Arc | Commodore 64 | £9.95 |
| Stock Market | Ed | Amstrad | £14.95 | Collins | Friday the 13th | Arc | Commodore 64 | £8.95 |
| Time Manager | Ed | Amstrad | £14.95 | Collins | Gyroscope | Arc | Commodore 64 | £7.95 |
| The Worm in Paradise | Ad | BBC | £9.95 | Level 9 | Scaletrix | Arc | Commodore 64 | £9.95 |
| Astro Plumber | Arc | BBC | £2.50 | Blue Ribbon | Starion | Arc | Commodore 64 | £8.95 |
| Citadel | Arc | BBC | £9.95 | Superior | The Young Ones | Arc | Commodore 64 | £7.95 |
| Diamond Mine II | Arc | BBC | £2.50 | Blue Ribbon | Zorro | Arc | Commodore 64 | £9.95 |
| Dr Who + Mines | Arc | BBC | £19.95 | Micro Power | Commando | Arc | Elite | £7.95 |
| Joey | Arc | BBC | £2.50 | Blue Ribbon | Q-Calc | Ut | QL | £9.95 |
| Ravage | Arc | BBC | £2.50 | Blue Ribbon | The Worm in Paradise | Ad | Spectrum | £9.95 |
| Artist | Ut | BBC | £2.50 | Blue Ribbon | | | | |

-this is called character independence in the trade.

The game looks vaguely like *Frankie*, since the characters wander about the rooms of the Young Ones' student house, displayed as double storey. Your view depends on where things are happening - you see whichever room your chosen character is in and another room where a lot is going on.

Commands are all issued via the joystick, à la *Frankie*, using a series of menus headed *Action, Walk, Talk*. The first leads to options such as opening cupboards and picking up objects, *Talk* leads the character to offer suggestions about what he should do and what he wants, eg, "I'd really like to smash the video" and *Walk* enables you to move the character to another room. The game revolves around acting in characters eg, Vyvyan tends to like destroying things.

So it goes and as such the game would merely be dull. However, the whole thing is chock full of bugs and bad programming. Bad programming takes the form of speech bubbles that flicker wildly if too much is going on at once, and become illegible.

Bugs are more exotic: the syntax logic in the speech bubbles appears to have downed a few too many dodgy pills leading to such remarkable utterances as *I think I should Open the Mikes Bed* (sic). Sometimes these descriptions disappear over the borders of the screen.

The whole thing is a mess and clearly isn't ready for release, although it is re-deemed by some excellent

music which will entertain you for around ten minutes. The question that creeps into my mind now is, what have all those magazines which have previewed and raved about this game been looking at?

Program *The Young Ones*

Price £7.95

Micro *Spectrum*

Supplier *Orpheus
The Smithy
Church Farm
Hadley St. George
Beds SG19 3HP*

MANKIND

Hypa Raid is one of the latest batch of budget titles from Atlantis Software who were in there fighting at the beginning with Mastertronic. *Hypa Raid* is, if not completely original, at least a variation of some game ideas not so done to death as usual.

It reminds me a little of *Frank n Stein*, a venerable game by PSS where you had to use your reasoning and



timing to use a cleverly constructed series of lifts. It's also like *Booty* in that you have to collect coloured keys.

Combine those two elements and you have a game in which you have to find your way around various screens using a series of up and down lifts and collect a series of key and data cards needed to get you through a number of differently coloured doors. All this in a *Miner* like scenario of guards who wander back and forth. Certainly the game requires more thought than the usual budget effort.

The point of all this is to collect all the parts of the Mig Starfighter, a nasty Russian device which may well be their answer to Star Wars. In any event your task is to aggressively share their technology for the good of mankind and keeping the Latin American countries Christian. One of the most ingenious budget games I've seen in a long while.

Program *Hypa Raid*

Price £1.99

Micro *Spectrum*

Supplier *Atlantis Software
19 Prebend Street
London
N1 8PF*

INGENIOUS

Time Sanctuary is an unusual program from MC Lothlorien - computer wargames from way back. This, though, is an adventure in a style all of its own, although there are touches of *Lords of Midnight* about some of the ideas.

The plot is quite clear, in-

volving injustice and an AWOL time machine. Your main objective is to find out where it went and get it back. This involves wandering around a strange land (which reminds me faintly of Pepperland with its various garish colour clashes.) The game features a kind of simplified LOM landscaping, where objects first seen in the distance grow in size as you move towards them.

The interaction is kept to single key presses for the most part, but an ingenious series of scrolling commands means that quite complex and specific instructions can be issued. There are various other characters in the game with whom you must deal, whose interaction with you is a key feature of the game. Their impression of you matters if you seek their help.

I think *Time Sanctuary* has plenty of imagination but lacks programming skill and slickness, the graphics have that user defined look and the character set has not been redesigned. The game looks like it is in Basic (although it probably isn't) though those are, to be fair, just the kind of comments that 'true adventurers' tell me are irrelevant to a true assessment of an adventure. I'll shut up and say it looks ropey, but shows signs of much original thought.

Program *Time Sanctuary*

Price £7.95

Micro *Spectrum*

Supplier *MC Lothlorien
56A Park Lorne
Poynton
SK12 1RE*

This Week

| | | | | |
|-----------------|-----|----------|--------|---------------|
| Alladins Cave | Arc | Spectrum | £6.95 | Artic |
| Back to Skool | Arc | Spectrum | £6.95 | Microsphere |
| Deathwake | Arc | Spectrum | £7.95 | Quicksilva |
| The Living Body | Ed | Spectrum | £14.95 | Martech |
| Think! | S | Spectrum | £7.95 | Ariolasoft |
| Cammac One | Ut | Spectrum | £5.95 | Micro Zeighty |
| Cammac Three | Ut | Spectrum | £19.95 | Micro Zeighty |
| Cammac Two | Ut | Spectrum | £11.99 | Micro Zeighty |
| Romaze | Arc | ZX81 | £3.95 | C Wehner |

Ariolasoft, Retail. **Artic**, Main Street, Brandesburton, Driffield YO25 8RL, 0401 43553. **Blue Ribbon**, Silver House, Silver Street, Doncaster, South Yorkshire DN1 1HL, 0302 21137. **C Wehner**, 9 Upper Park, NW3 2UN. **Collins**, 8 Grafton Street, London W1X 3LA. **Domark**, 204 Warple Road, London Sw20 8PN, 01-947 5624. **Elite**, 55

Bradford Street, Walsall WS1 3QD, 0922 611215. **Kuma**, Kuma Computers, 12 Horseshoe Park, Pangbourne RG8 7JW, 07357 4335. **Leisure Genius**, 3 Montagu Row, London W1H 1AB, 01-935 4622. **Level 9**, 229 Hughenden Road, High Wycombe, Bucks HP13 5PG, 0494 26871. **Martech**, Martech House, Bay Terrace, Pevensey Bay, East Sussex BN24 6EE, 0323 768456. **Melbourne House**, 39 Milton Trading Estate, Abingdon, Oxon OX14 4TD, 0235 835001. **Micro Power**, Northwood House, North Street, Leeds LS7 2BB, 0532 434006. **Microsphere**, 72 Rosebury Road, London N10 2LA, 01-883 9411. **Pscientific**, 37 Cottesmore Road, Hessle, North Humberside HU13 9JQ, 0482 649187. **Quicksilva**, Palmerston Park House, 13 Palmerston Road, Southampton, Hampshire SO1 1LL, 0703 20169. **Superior**, Regent House, Skinner Lane, Leeds LS7 1AX, 0532 459453. **US Gold**, Unit 10 The Parkway Ind Centre, Heneage Street, Birmingham B7 4LY, 021 359 3020.



Alternative World

It seems to be fashionable to be snuffy about computer games.

A writer in one recent report I read said that young people who owned computers and used them mostly for games-playing had no significant advantage when starting computer studies at school.

I wonder. At the simplest level, my own experience suggest that children with home-computers gain at the very least a basic knowledge of the Qwerty keyboard. While the typing rooms in schools are still too likely to be seen, however erroneously, as low-status 'female' ghettos, home computers are among the few ways in which the intelligent young are likely to be made familiar with an important part of their future working environment.

Then I wonder about the computer studies that these pupils are starting. Are they learning to program? Are they being given general computer awareness courses? Are they plugging away at some of the dreaded 'education' software?

Watch young people playing a good computer game together and the first thing you realise from their cryptic comments is that they share an intimate knowledge of an alternative world. Games-playing is not the solitary activity that some of its critics claim. Players like to share their insights, knacks and dodges with fellow devotees.

Language, in fact, is what it's all about. They are immersed in the game's symbol-system, and are reading it on various levels.

First, maybe, there's the fictional level, the pretext of the game, the stuff it talks about on the cassette inlay. "You are alone on a monster-ridden planet and being attacked . . ." or "Miner Willy has had a party and must collect . . .". That sort of thing. This level seems to matter the first time you play a game, but is soon forgotten. Its relative insignificance is often signalled by jokiness - mutant camels, flying hairspray, etc.

Next comes the manipulative level, where the player learns how the joystick or keyboard relates to the screen. Every good game has its own feel, and the hand on the joystick trigger must learn to react faster than the conscious mind.

Then comes a deeper level where you attune to the programmer's wavelength - where consciously or unconsciously you find the patterns in the game, and suddenly realise how particular problems can be coped with.

This interconnects with a more technical level, where the player gets to know how sprites behave.

There can also be a hacking level, where useful *Pokes*, often communicated as folklore on an informal network, help you to beat the system by playing it on its own machine-code terms. All's fair in computer-gaming.

Games are absorbing because players can operate on all these levels simultaneously, enjoying a rich and multi-layered experience.

Too often educational programs present the machine as the all-knowing expert that marks you right or wrong and penalises you if you step outside its often all too rigid categories. (Stories of programs grimly rejecting intelligent input that hasn't been anticipated are, of course, legion.) The computer is cast as rigid tyrant that humans must bow before. Fit in or fail.

In a game, on the other hand, the program is a system that challenges you to beat it, by fair means or foul, where you probably discover the best strategy by ganging up with your friends.

I know which I think offers the best preparation for life.

George Simmers

Puzzle No 186

Can seven plus eight ever equal 12? Yes! - if the sum is in the form of an alphabetic as shown below:

```

S E V E N  +
E I G H T
-----
T W E L V E

```

As is usual in puzzles of this type, each letter stands for a digit, the same letter representing the same digit whenever it occurs. Can you find the original sum - though you may find more than one possible answer!

Solution to Puzzle No 181

The correct sum is: $17 \times 4 = 68 + 25 = 93$.

```

10 FOR A=1 TO 9
20 FOR B=1 TO 9
30 IF A=B THEN GOTO 250
40 FOR C=1 TO 9
50 IF C=A OR C=B THEN GOTO 240
60 LET Z=(A*10+B)*C
70 Z=STR$(Z):Z=MID$(Z,2)
80 LET U=VAL(MID$(Z,1,1)):LET W=VAL(MID$(Z,2,1))
90 IF U=A OR U=B OR U=C OR U=W THEN GOTO 240
100 IF W=A OR W=B OR W=C OR W=W THEN GOTO 240
110 FOR D=1 TO 9
120 IF D=A OR D=B OR D=C OR D=W OR D=W THEN GOTO 230
130 FOR E=1 TO 9
140 IF E=A OR E=B OR E=C OR E=D OR E=W OR E=W THEN GOTO 220
150 LET Y=(D*10+E)*Z
160 IF Y%999 THEN GOTO 220
170 LET Y=STR$(Y):Y=MID$(Y,2)
180 LET T=VAL(MID$(Y,1,1)):LET U=VAL(MID$(Y,2,1))
190 IF T=A OR T=B OR T=C OR T=D OR T=W OR T=W OR T=W OR T=W THEN GOTO 220
200 IF U=A OR U=B OR U=C OR U=D OR U=W OR U=W OR U=W OR U=W THEN GOTO 220
210 PRINT A,B,C,,D,E,Y
220 NEXT E
230 NEXT D
240 NEXT C
250 NEXT B
260 NEXT A

```

The program works by generating the first three digits (A, B, and C) and calculating the resulting product $(A*10+B)*C$. This gives the result of the first stage of the calculation. The digits of this product are then checked to see that they have not already been used (lines 80 to 100). A further two values are then generated in two FOR/NEXT loops, again checking for duplication of digits (lines 110 to 140). These digits represent the number which is to be added. When this is done (line 150) the final result is again checked for duplication.

Line 210 prints any solution which passes these tests.

Winner of Puzzle No 181

The winner is E J Sargeant of Long Eaton, Nottingham, who will be receiving £10.

Rules

The closing date for Puzzle No 186 is January 1.

The Hackers



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WINTER GAMES



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