

to Rock

POPULAR Computing WEEKLY

Only 40p.

13-19 December 1984

It's the best selling weekly

Vol 3 No 50

Enterprise arrives

AFTER one of the longest production delays yet in the home computer industry, the 64K Enterprise computer should begin to trickle through to the shops before Christmas.

"We are beginning supplies to Prism, our distributors, this week," said Enterprise's marketing manager Mike Shirley. "Before Christmas, the computer will only be available

in nominal quantities but we hope to reach full production by February 1985."

Originally priced at just under £200, the Enterprise will now cost £249.95.



The Enterprise is based on the Z80 chip and of its 64K Rom 58K is available for use. It has a 'professional' quality keyboard with 8 programmable function keys. Screen display is 56x84 characters, and includes a 'windowing' facility. The machine has twin cassette parts,

continued on page 5 ▶

Timefame gains support

TIMEFAME International's removal from BT's Prestel service has sparked off minor security breaches on BT's prestige Telecom Gold system.

Computer giants ICL discovered messages left by hackers in mail-boxes used for demonstration purposes, referring to Timefame's removal.

Timefame has also received messages of support for its action from MPs — through the post — and one from the editor of the Micromouse database on Micronet 800.

Timefame's removal came after a chain of events dating back to the Prestel breach of security at the beginning of November, when personal mail boxes including that of Prince Philip were broken into (see *Popular Computing Weekly*, November 8).

After those incidents Prestel changed all its information providers' (IPs) codes.

Timefame then discovered that some of its pages had been used over a weekend and the company notified British Telecom of this apparent lapse.

Timefame claims there was no response from British Telecom regarding any investigation into a breach of files after the change of identity codes.

On November 28, Timefame prepared a notice to go into its 'letterbox', an area where Ti-

continued on page 5 ▶

Tramiel talks in UK

ATARI boss Jack Tramiel paid a flying visit to the UK last week to outline the company's plans for next year — including the launch in January of a new 16-bit 68000 machine for under £300.



Atari boss Jack Tramiel

Atari plans to develop four different 'families' of computers.

It will continue to produce the 2600j and Jr video games

machines in the video console range.

A series of four 8-bit machines is planned, comprising

a redesigned version of the 800XL (64K), a 128K model, a new version incorporating a music keyboard, and a portable lap-held model.

The new 16-bit micro, based on the 68000 processor, will use a new operating system, to be called TOS (Tramiel operating system) jointly developed by Atari and Digital Research. Di-

continued on page 7 ▶

THE BIG THREE

THREE ESSENTIAL PACKAGES CAN BE YOURS FOR WELL UNDER THREE FIGURES!



DATABASE

Micro Magpie for the Commodore 64 is probably the most advanced database management system available for any home micro. With Micro Magpie you can create a database system tailored exactly to your own information handling requirements.

With most database systems, you only get out what you put in. Micro Magpie gives you more! It can manipulate data between different files, perform calculations on numerical data, print out reports, and hardcopy data in graphical form. Only Micro Magpie can give you all these features.

- * Fully user programmable database management system.
- * Operated by easy-to-use pop-up menus using just four keys.
- * 100% machine code program for speed and compactness.
- * Can perform complex calculations on numerical data.
- * Searches on any field, with wild card and part-field matching.
- * Works with one or two 1541 disk drives.
- * Horizontal or vertical bar graph or scatter graph output.
- * Integral Centronics interface for parallel printer option.
- * Professionally written instruction manual.
- * Help readily available from Help Disk.
- * Free application templates - Mailing List and Stock Control.

Micro Magpie would be excellent value if you bought it for the applications alone! You can have a highly sophisticated Mailing List system up and running within minutes, and you'll still be using only a fraction of Micro Magpie's potential! Once you start tailoring your own custom applications, you will begin to discover why Commodore User magazine called Micro Magpie "the software bargain of the year!"

MICRO MAGPIE - ON DISK ONLY

£39.95 inc VAT



SPREADSHEET

Micro Swift - the affordable professional spreadsheet system for the Commodore 64. Micro Swift will prove indispensable in business or around the home to construct models of income and expenditure, for carrying out instant 'what-if' calculations to see how a change in one or more figures affects all the other figures; or for specialised applications where complex number crunching is required. Micro Swift is unique in that it is operated by pop-up menus, a system pioneered by our Magpie database program. No longer do you have to memorise a whole hierarchy of commands and control keys - the menus appear when you want them, and disappear when you don't.

Micro Swift is written totally in machine code (beware other spreadsheets in Basic!) for speed and compactness, giving you more room to construct more complex models.

Micro Swift gives you these amazing features...

- * A1 to Z254 cell matrix.
- * Variable cell widths.
- * Split screen facility.
- * User definable numerical precision and display formatting.
- * Integral Centronics Interface for parallel printer option.
- * Automatic execution of user-programmed sequences.
- * Graphical display option.
- * Operated by easy-to-use pop-up menus.
- * Free ready-programmed applications included.
- * File storage on disk or cassette.
- * Full instruction manual included.

Don't be fooled by the price! Micro Swift gives you facilities equal, if not superior, to spreadsheets costing many times more. Micro Swift is available on disk or cassette. Micro Swift - Spreadsheet power to the people!

MICRO SWIFT - ON DISK OR CASSETTE

£19.95 inc VAT



WORD PROCESSOR

Micro Wordcraft is our new disk-based professional word processor. It is a direct descendant of the highly respected Wordcraft program, which is in use world-wide on the larger Commodore machines, Sinus, and IBM PC, etc. Written in 100% machine code, Micro Wordcraft spells affordable office quality word processing for the home or business user.

It is often said that "you get what you pay for"; but with the Audiogenic Professional Series you get what you pay for and more!

Micro Wordcraft gives you all these advanced facilities...

- * Full text control - document width up to 99 columns, tabs, decimal tabs, justification and centering.
- * Full text manipulation - on-screen editing, block move, block delete, string search and replace, underlining and emboldening.
- * Scrolling screen display, uncluttered by control characters.
- * Name and address files can be created and merged into standard letters.
- * Easy merging of standard paragraphs. Compatible with Commodore, parallel and RS232 printers.
- * Integral Centronics interface for parallel printer option. Instantly accessible Help screens.
- * Comprehensive instruction manual included.

The name and address merging capabilities of Micro Wordcraft make it an ideal tool for small businesses, clubs, societies or hobby groups, where there are regular mailings of standard letters. For home use, Micro Wordcraft contains all the facilities you could ever need, at a price you can easily afford!

MICRO WORDCRAFT - ON DISK ONLY

£24.95 inc VAT

The Audiogenic Professional Series represents a price breakthrough for business-orientated software products. With Micro Magpie, Micro Swift, and Micro Wordcraft, the power and convenience of the computerised office can be a reality for all Commodore 64 owners!

Each of the three products represents the state of the art in its particular field. Great care has been taken over the documentation to make sure that you, the user, can quickly make use of the facilities available. Also, a full backup service is provided by the Audiogenic Technical Department, who are only a phone call away if you have any queries about the products.

So, whether it's for your home, business, club or society, make sure you go for the Audiogenic Professional Series!

Audiogenic LTD

PROFESSIONAL SERIES

AUDIOGENIC LTD, P.O. BOX 88, READING, BERKS., ENGLAND. Tel: (0734) 664646

It seems the near-mythical Enterprise will shortly be with us.

Production of the machine, which was first announced 15-16 months ago, has been dogged by an unprecedented series of delays. Not only that, but the company behind the micro has gone through more identity crises in that time than would seem credible — first Samurai, then Elan, then Flan (muffled laughter) and now Enterprise.

When first conceived the 48K Spectrum was still £175. The Oric Atmos had yet to appear. The QL, Spectrum+, Commodore Plus/4 and C16 were all but a twinkle in their designers' eyes.

In 1983 the Enterprise was greeted enthusiastically by potential buyers, press and programmers alike. Its £199 price made it an exceptional machine.

How does it look now? Now it costs £250. Is it still a world beater?

In fact, the machine has withstood the passage of time remarkably well. Where it was excellent, it is now merely competitive.

The Enterprise has been lucky that the QL got off on the wrong foot. Lucky that Commodore's Plus/4 adds so little to the C64. And lucky that the Japanese MSX design was so conventional and cautious.

So — despite being a little overpriced, and even though its initial software support looks weak — the Enterprise still looks quite attractive.

But the Spectrum and Atari 800XL (both at £129) represent fierce competition.

Moreover, next year, Atari's £300 16-bit machine and Commodore's C128 and Amiga machines are likely to quickly overshadow the Enterprise.

Presents...

News > Acorn pulls out of US

5

Star Game > Explore strange new worlds — and bomb them on Spectrum 48K

12

Streetlife > Christina Erskine makes her way to Tansoft and talks to new Managing Director Bruce Everiss

16

Hardware Review > Multi-tasking on the ZX Spectrum — the XP memory expansion system investigated

18

Which MSX > Jeff Naylor spots the differences between the Micro clones

20

Software Reviews > *Doomdark's Revenge for Beyond* > *Witch's Cauldron* from Mikro-Gen

24

Spectrum > A new string search function for any Spectrum by Roy Whittle

40

Commodore 64 > Jeff Minter special — preview of *Psychodelia*, Llamasoft's new release

32

BBC and Electron > Test your knowledge with Biology Quiz for the BBC B by Simon Pithers

36

Amstrad > Expand your graphic capabilities on the CPC 464 with Brian Cadge

44

Best of the Rest > Letters 7 > The QL Page 40 > Open Forum 48 > Arcade Avenue 48 > Music Box 50 > Microradio 52 > Book Ends 53 > Baud Walk 54 > Adventure Corner 56 > Peek & Poke 59 > Readers Chart 66 > Diary, Top Ten 66 > New Releases, This Week 67 > Ziggurat, Puzzle, Hackers 70

Futures...

Special Christmas issue... Top 10 programs of the year... Review of the year... Readers poll

Editor David Kelly News editor Christina Erskine Features editor Graham Taylor Software editor John Cook Production editor Lynne Constable Editorial secretary Geraldine Smyth Advertisement manager David Lake Assistant advertisement manager Alastair Macintosh Advertisement executive Tom Watson Classified executive Diane Davis Advertising production Lucinda Lee Administration Theresa Lacy Managing editor Duncan Scot Publishing director Jenny Ireland.

Published by Sunshine Publications Ltd, 12-13 Little Newport Street, London WC2H 7PP. Tel 01-437 4343 Telex 296275 Typeset by The Artwork Group, 55-63 Goswell Road, London EC1, in association with Ink on Paper Ltd Printed by East Midland Litho Printers Ltd, Oundle Road, Woodston, Peterborough PE2 9QR Distributed by S M Distribution, London SW9, tel 01-274 8611, telex 261643. © Sunshine Publications Ltd 1984.

ABC

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

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

Computer Trade Association Magazine of the Year



REWRITE THE HIGH SCORE TABLES

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

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



VULCAN
ELECTRONICS LTD
Joystick Genius

Enterprise

continued from page one

RS423 and Centronics interfaces, a Rom slot which can handle up to 64K Rom cartridges and stereo sound output. A structured Basic is included, together with a built-in word processor.

The Enterprise has a flexible range of graphic modes — fifteen in total — dictated by the number of colours the user wishes to display on screen. There is also a choice of two text modes — 40 cols or 80 cols.

A very limited amount of software will also be available at launch. Four arcade programs written entirely in Basic will be released this year.

"Obviously we will be doing a wide range of machine code games later, but at least we're getting some out," Mike continued.

The four packs, labelled Starter Software, comprise *Dictator*, a strategy game, *Five in a Row*, a ball game simulation, and two simply entitled *Games Pack 1* and *Games Pack 2*.

"These are simple games where the user is encouraged to break into the program to see how they work," said Stephen Gandy, Enterprise's product manager. "These will each be priced at £5.95, though our later games will probably be nearer the £7.95 mark."

Timeframe

continued from page 1

Timeframe invites Prestel users to place and exchange messages and letters of topical interest. The notice stated that there could be a possibility of a 'mole' in British Telecom itself.

The notice was displayed on Prestel late on November 28 and the next day, Timeframe received a letter from British Telecom stating that Timeframe was in breach of a clause in the Prestel contract, stating that subscribers should not bring BT or Prestel into disrepute. Timeframe was asked to remove its letterbox notice and display a retraction.

The retraction asked for was not printed, and Timeframe was blacked from Prestel within hours.

Timeframe is apparently now seeking a court injunction against its blacking by BT.

Timeframe declined on Friday to comment on the situation.

Intelligent Software has written a range of twelve products, due out in February under the Enterprise label. These include an assembler/disassembler, *Chess*, *Lisp* and *Fort* languages, an arcade game, *Jungle Jim*, and *Nightmare Knight*, a graphic and text adventure.

A number of software houses are also working to produce program conversions for the Enterprise, including Quicksilver and Mikro-Gen.

On the peripherals side, Enterprise plans to release, under the Enterprise name, a medium resolution monitor manufactured by Microvitec, for £329.95 and a Mannesman Tally dot-matrix printer, running at 100 cps, at around £230.

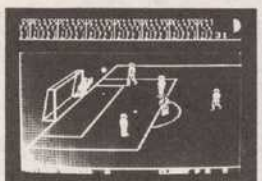
The company is also talking to Kempston about the possibility of producing further peripherals for the machine.

"We will be releasing both single and dual disc drives, running standard 3½ inch discs and with CP/M built in," Stephen continued. The price for the dual system will probably be £599.95 or similar."

These products, plus the 128K version of the computer, are all scheduled for release in the first half of next year.

The Enterprise is being manufactured in Perth, Scotland, by GRI Electronics.

Kicking off



OCEAN has released *Match Day*, a football simulation game for the Spectrum.

For either one player (playing against the computer), or two players, you control your side's movements on pitch.

Ocean is not planning any versions for other machines at the moment. *Match Day* costs £7.95.

● A BBC 2 documentary *Commercial Breaks* being shown tonight (December 13) at 8.00pm visits both Ocean and Imagine, the Liverpool company which folded last summer.

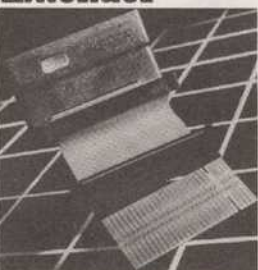
Acorn cuts US drive

DISAPPOINTING sales in the US of its BBC micro has led Acorn to drastically reduce its presence in the United States.

Acorn opened an office with around 40 staff and a warehouse in the US about a year ago. It planned to capture 10% of the educational market with the BBC, buying the US rights to the BBC's educational television series based on the computer.

"Acorn's optimism wasn't justified and the market impact turned out to be far less than 10%," said an Acorn spokesman.

Extender



If you find your Spectrum edge connectors are wearing thin, Kempston has brought out an Extender Cable, to give a flexible connection between the Spectrum or Spectrum+ and any Kempston interface.

The Extender is also fitted with a replaceable edge card.

The device is priced at £7.94. Details from Kempston Micro Electronics, Unit 30, Singer Way, Woburn Road Industrial Estate, Kempston, Beds.

Elite bug is removed

THE bug in Acomsoft's Electron version of its top-selling game *Elite* is to be removed (see *Popular Computing Weekly*, December 6).

Electron owners who bought *Elite* discovered they could not 'hyperdrive' from one galaxy to another as on the BBC version.

"A new version of the game is being brought out, we hope before Christmas, in which you can 'galactic hyperspace'," said an Acorn spokeswoman.

"Acorn will offer replacements to those who have already bought *Elite* on the Electron."

"Acorn has reduced its US facility by around 80% which brings it more in level with its US sales," he continued. "However, there is still a small office out there to deal with software support for schools which have taken the BBC."

Acorn is also retaining its research facility at Palo Alto in California.

● Acorn's share price dropped 14p to 61p last week, after the news that it had cut down its US operation. This compares with a striking price per share of 120p when Acorn entered the USM fourteen months ago.

Emulator for CBM 64

A NEW emulator to enable the Commodore 64 to run BBC Basic has been developed by a group of companies.

CH Co-ordinates, Aztec and Milton Keynes Music and Computers, have written the emulator between them.

"The hardware differences between the machines mean that the emulation isn't exact to the last detail," said a spokesman for the consortium.

Most machine-code programs cannot be run using the emulator on the C64 but programs written entirely in BBC Basic should work.

"The main aim of the emulator is to enable schoolchildren owning a 64 to do homework from their school's BBC."

The BBC Emulator should be in the shops next week, priced at £14.95 on cassette.

Micronet — a correction

AN ITEM headed "Prestel Breached" in the December 6 issue said that on December 2 a group of hackers had broken into Micronet's sub information provider *Micromouse* leaving the message "Bring back Timeframe — hack of the century". The article described this as a serious breach of security.

In fact the Editor of the *Micromouse* database put up the message "Bring back Timeframe #8181 # R A-OK" in connection with a story headed "The Ultimate Hack?" screened on December 3 with the full knowledge of Micronet. There was no question of Micronet's security having been breached.

tír na nòg

NOMINATED For
C.T.A.
GAME OF THE YEAR
award



GARGOYLE GAMES

£9.95

48K ZX SPECTRUM

Tir Na Nòg—the land of youth, the other world.

Tir Na Nòg—the kingdom of the sidhe, the home of dagda's cauldron.

Tir Na Nòg—a vast and complex adventure, in a magical celtic landscape.

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

Tir Na Nòg—a true computer movie.

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

Atari

continued from page 1

gital Research's applications package, *Gem*, will be bundled with the machine.

At the top of the range, Atari is developing a 32-bit work station for professional use, based on the National Semiconductor 3232 processor.

The 8 and 16-bit machines will be shown at the Winter Consumer Electronics show in Las Vegas in January.

"The redesign of the 800XL will be largely a rehousing job," said Jack Tramiel. "It will be compatible with the existing version — indeed the whole 8-bit range will be compatible.

"For the 16-bit machine, we have a number of peripherals lined up — disc drives with storage capacities of ¼ megabyte up to 20 megabytes on a hard disc drive, and four different printers.

"The 16-bit machine will not be compatible with IBM or Apple models. TOS is a proprietary operating system. I do not compete with IBM — I make PCs for the masses, and

leave the business side to IBM."

Tramiel stressed that all the new machines were aimed at a mass market — a policy reflected in the provisional prices. The Atari 800XL is expected to remain at £129, and prices for the new 8-bit range will be comparable. Atari plans to price the 16-bit at around £300, and the 32-bit at "below \$1000", and thus under £900.

All the new products will be available in the UK — around April for those launched at CES, and June-July for the 32-bit workstation.

On the software side, Atari plans to develop further the role of Atarisoft. "Atarisoft has added a new line of products, and we want to develop Atari implementations of best-selling games. I'm also looking carefully at the pricing — and possible reductions to be made in January," said Tramiel.

"There will be a small software base for the 16-bit when it comes out, and Atari has access to the entire Digital Research library. You can expect a number of languages such as Dr Logo, Pascal and

Fortran to be available when the machine comes out."

Tramiel hopes that by the end of December Atari will have broken even — a sharp turnaround, as Atari was losing £10m per month when it was part of Warner Comms.

He plans to raise further finance for the company through a private placement within the next few months, and intends Atari to go public next summer.

Tramiel says he has now settled over 85% of creditors' claims outstanding when he took over Atari in June.

C16 in flight

ONE of the first releases for Commodore's new C16 computer is Craig Communications' *Flight 015*.

Programmer John Wagstaff (see *Popular Computing Weekly*, October 11) has written an enhanced version of his original Vic 20 game. The C16 version features five skill levels, a more sophisticated landing routine, and continuously up-dated status reports.

Flight 015 for the C16 is being released this week at £5.95.

A musical showing

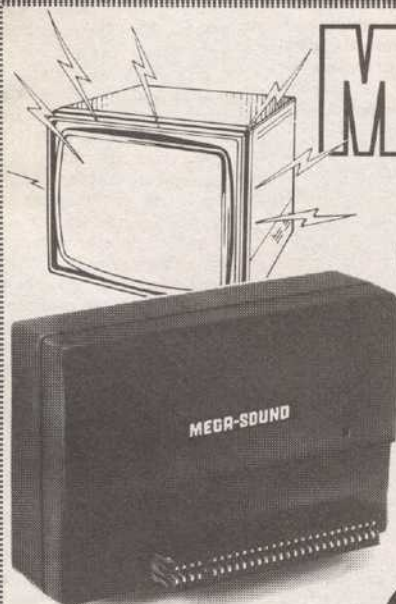
MUSIC was the predominant theme at the Electron and BBC Micro User Show, held at the Royal Horticultural Society's Hall on December 6-9.

Acorn's own Music 500 synthesiser for the BBC, launched a month ago at Compec was demonstrated as was a fully digital synthesiser, The Clef, from Computer Music Systems, also for the BBC.

The latter costs a hefty £495.00 for the full system comprising keyboard, PDG tone generation system, power supply and software on disc.

Island Logic's *Music System* is slightly different, being a software package to play or create tunes with just the micro, using on-screen icons for menu selection. *Music System* costs £24.95 on disc, and £12.95 on cassette.

Slogger Advanced Systems showed its Rombox Rom expansion unit for the Electron, while Aries Computers had a 20K BBC Ram expansion pack on view.



MEGA-SOUND

FOR SPECTRUM 48K

Compatible with ZX Spectrum +

Achieve amazing sound capabilities that your Spectrum has been lacking.

The Cheetah Mega-Sound simply plugs into the user port at the rear of your computer and enables the Spectrum sound to be amplified through your T.V., providing you with a whole new sound dimension. The Spectrum "Beep" will also be amplified through the T.V., ensuring confidence when pressing keys during programming.

Truly Amazing

at £10.95

Prices include VAT, postage & packing.
Delivery normally 14 days.
Export orders at no extra cost.
Dealer enquiries welcome
Cheetah products available from all good computer stores.

Cheetah
Marketing



DEPT PCW
Cheetah Marketing Ltd, 24 Ray Street,
London EC1R 3DJ. Tel: 01 833 4909.
Telex: 8954958.

Knocking spots off MSX

OK, so I have been forced to eat humble-pie. Since writing to you in praise of the MSX concept I have to admit my opinion has undergone a complete reversal!

I have now had hands-on experience of many of these new machines, and they fall down in a number of very important respects.

The keyboards on some of the machines are really quite terrible — very unresponsive, failing to register key-presses unless one is very careful. In some cases, even the Spectrum's is better!

The picture quality produced by the MSX's is not as good as one was led to believe. The Spectrum knocks spots (or should I say pixels?) off them.

Also, I am amazed at the high quality of the new breed of games now coming on to the market for the existing machines. *Lords of Midnight* was but a forerunner of some truly unbelievable programs — *Tir Na Nog*, *Deus ex Machina*, *Knights Lore and Swords* and *Sorcery*.

These programs' complexity overcomes all my objections concerning the Spectrum, and make it by far the best buy on the market. It is difficult to see how the MSX companies can justify such high prices.

D A Austin
15 Stafford Avenue
Clayton
Newcastle-under-Lyme
Staffs ST5 3BN

Somewhat sceptical

The issue of November 15 carried a review by Bill Hoskins of our book *QL Assembly Language Programming* and we are rather unhappy about several of the points made in the review.

The particular points are first, that the book is very similar to the *QL Advanced User Guide* and the *QDOS Manual* and retains "the same inaccuracies". We maintain that the points of similarity are only those which you would expect when books cover similar subjects, and that the treat-

ment is completely different. The author, Colin Opie, wrote the book in consultation with Tony Tebby as Technical Adviser, and they are somewhat sceptical about your reviewer's qualifications to comment on technical accuracy.

The expression "uncannily similar to those in the book's rival", would be thought by any fair-minded traveller on the Clapham Omnibus to mean at worst plagiarism and at least sharp practice. It is true that each book contains a clock program. They are, however, manifestly different; in our book it is an analogue clock which counts seconds, for example. The similarities in the program appear to us to be very superficial.

Finally, it is not true that our book is "more expensive". Both books are £12.95.

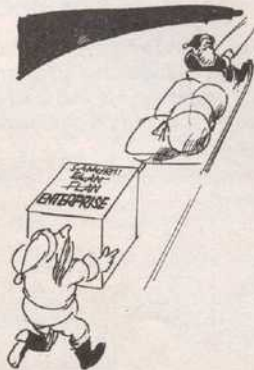
In general publishers accept comment and criticism, even when it expresses a reviewer's misconceptions and prejudices, however, we feel that this review goes beyond that and was in our view unfair.

Jeremy Dicks
Software Sales Manager
McGraw-Hill Book Co
Shoppenhangers Road
Maidenhead
Berks

QL Assembly Language Programming contains a number of inaccuracies which are found in Sinclair's QDOS Manual.

Sinclair itself has warned of possible errors in the preliminary QDOS manual.

A couple of examples: the



"Hold it, Sir!"

Edit Line description is very misleading and the necessary method for turning the microdrives is not even mentioned.

The programs in the two books are substantially different and both books are priced at £12.95, but I have to say that I still prefer Adder's Advanced User Guide.

In my view the only additional technical material compared to the QDOS Manual in the McGraw-Hill book is the program listings themselves — Bill Hoskins.

A pleasant surprise

Re 'Dragon lives on' in your November 29 issue — I was pleasantly surprised to read your reply to M P Baker.

All too often now it seems that computer software houses and magazines are only too ready to withdraw their support once a particular home computer becomes 'obsolete'.

They seem to forget that the people being forgotten are the very same people who not so long ago supported them by buying their games and magazines.

Keep the Dragon articles flowing.

A E Standing
32 St David's Close
Iver Heath
Bucks

Freezing the QL

I'm not sure if many QL owners know this but, pressing *Control* and *F8* seems to freeze the computer. It can then be unfrozen by pressing any key.

This is useful because when you are listing a long program it can be stopped and started to view it easily.

Even the Psion programs — a long *Quill* document, for example, can be stopped using the two keys.

A J George
Kenmore
The Glen
Saundersfoot
Dyfed

Pleased for the Amstrad

I am greatly pleased to see your magazine has started printing articles and reviews for the Amstrad CPC464.

Owen Davies
Hill Cottage
Sutton Place
Ainger Hammer
Dorking
Surrey

Computer wilderness

PCW is clearly the most popular and heavily used magazine to which this school subscribes, so much so that we need two copies per week. However, despite its undoubted popularity with a substantial proportion of our 1877 students, aged 12-18, many express disappointment that the RML 380Z and RML 480Z computers seem only to be the subject of an occasional letter, usually from another teacher.

No one could possibly expect a popular weekly magazine to be able to extend coverage to every single micro in use, but if one were to compile statistics reflecting micros used by, rather than bought by, children and young people, I suspect that the RML machines would rank very highly.

An occasional mention of these machines would be justified and might even serve to enhance your sales to schools and young people. Please help our young students to escape the feeling that their school computing is in a sort of wilderness as far as the press is concerned.

D R Schofield
School Librarian
The Ousedale School
Newport Pagnell
Bucks

The only reason the Research machines are featured so rarely in these pages is simply that we are never sent programs to review for them, presumably because such software is exclusive to schools. Nor do our readers send us program listings for people to type in which run on them. We can only reflect what we are sent.

DEMONS OF TOPAZ



100% GRAPHIC EXPLORATION



firebird
SOFTWARE

A game of distinction  from British Telecom.

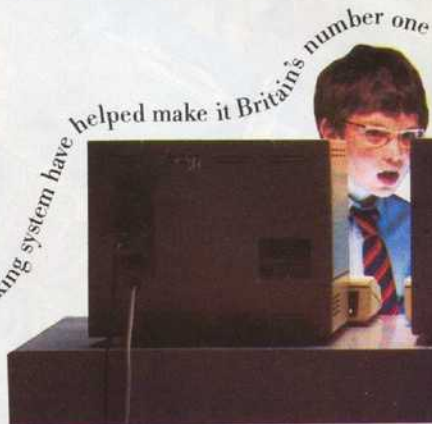
WELLINGTON HOUSE, UPPER ST. MARTIN'S LANE,
LONDON WC2H 9DL. TEL: 01-379 6755/5626

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

COMMODORE 64

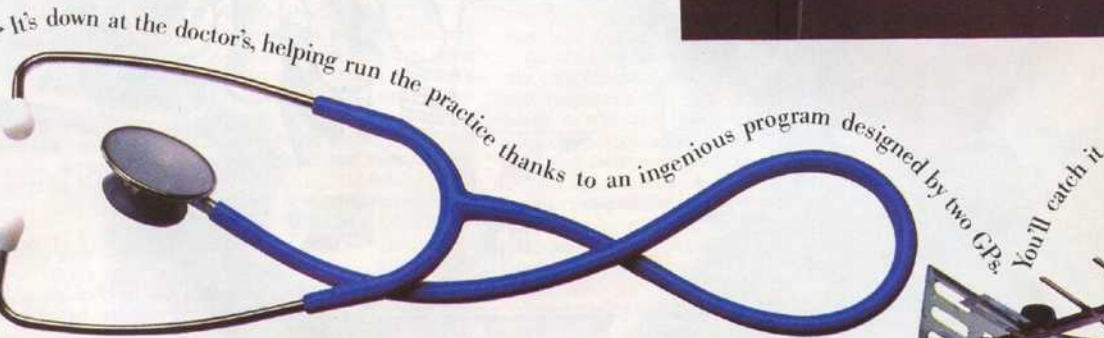
**GOLD
EDITION
£5.95**

The BBC Micro is only 16" long. But it stretches indefinitely.

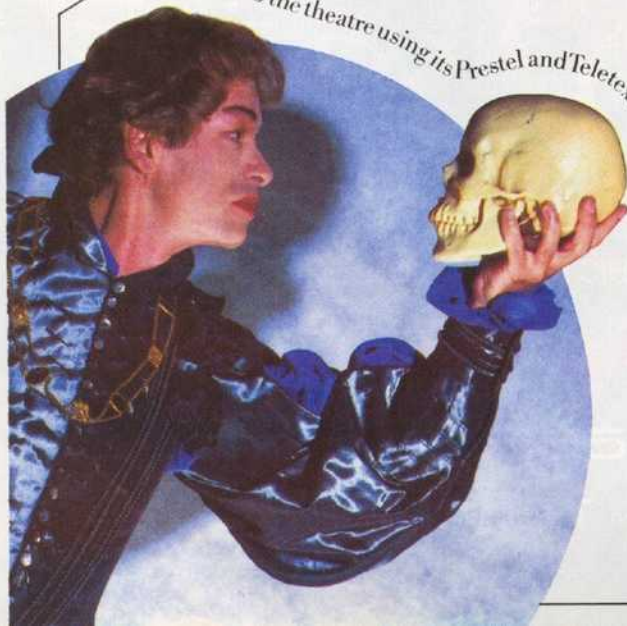


helped make it Britain's number one
networking system have

It stretches into schools where BBC Basic and the Econet networking



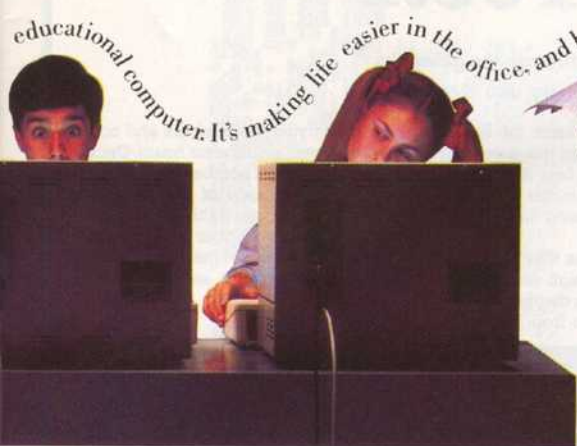
It's down at the doctor's, helping run the practice thanks to an ingenious program designed by two GPs. You'll catch it



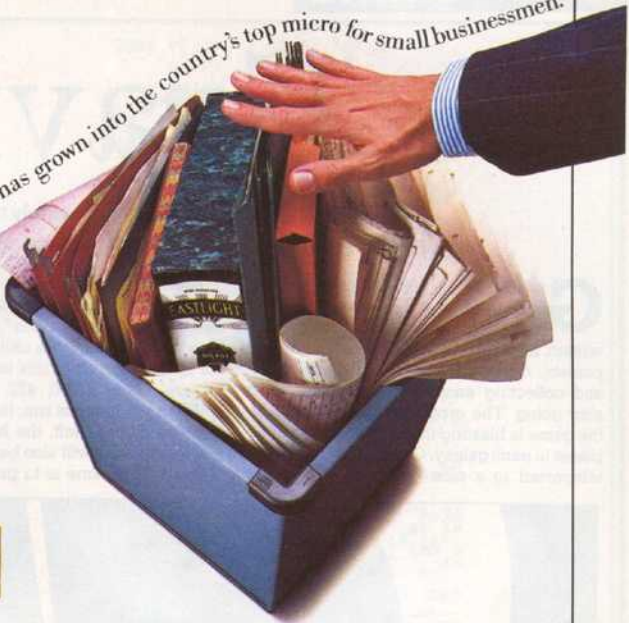
It can take you to the theatre using its Prestel and Teletext adaptors. While helping out at the lab with its scientific monitoring interface. It has even been



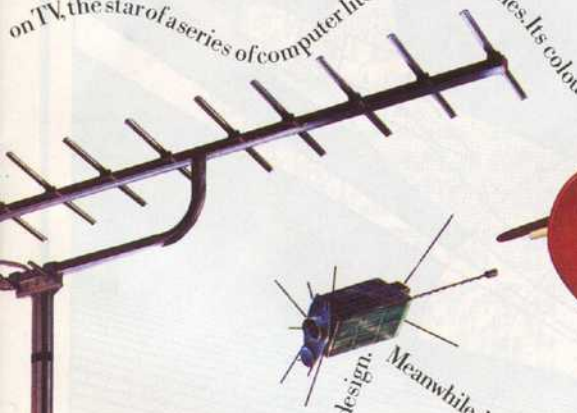
It has even been



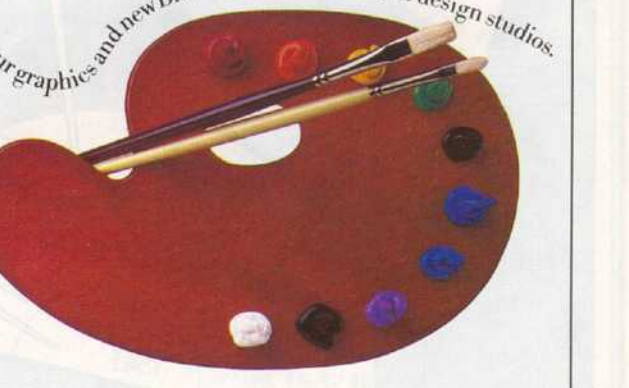
educational computer. It's making life easier in the office, and has grown into the country's top micro for small businessmen.



on TV, the star of a series of computer literacy programmes. Its colour graphics and new Bitsik make it welcome in design studios.



working in space, tracking a satellite it also helped design.



Meanwhile, back on Earth at 49 Acacia Avenue, Kilmarnock, Scotland.



The BBC Microcomputer System. The world's best. And still growing.

The BBC Microcomputer System is designed, produced and distributed by Acorn Computers Ltd.

Gravitar

Can you guide your ship safely through the galaxy in Gravitar for 48K Spectrum, by Jim Arovan

Gravitar, for the 48K ZX Spectrum is a version of what I believe to be the best vector scan arcade game ever written. It consists of flying to many different planets, destroying enemy defence sites and collecting enough fuel to keep your ship going. The crowning achievement of the game is blasting the reactor on the final planet in each galaxy. On doing this, you are teleported to a new galaxy.

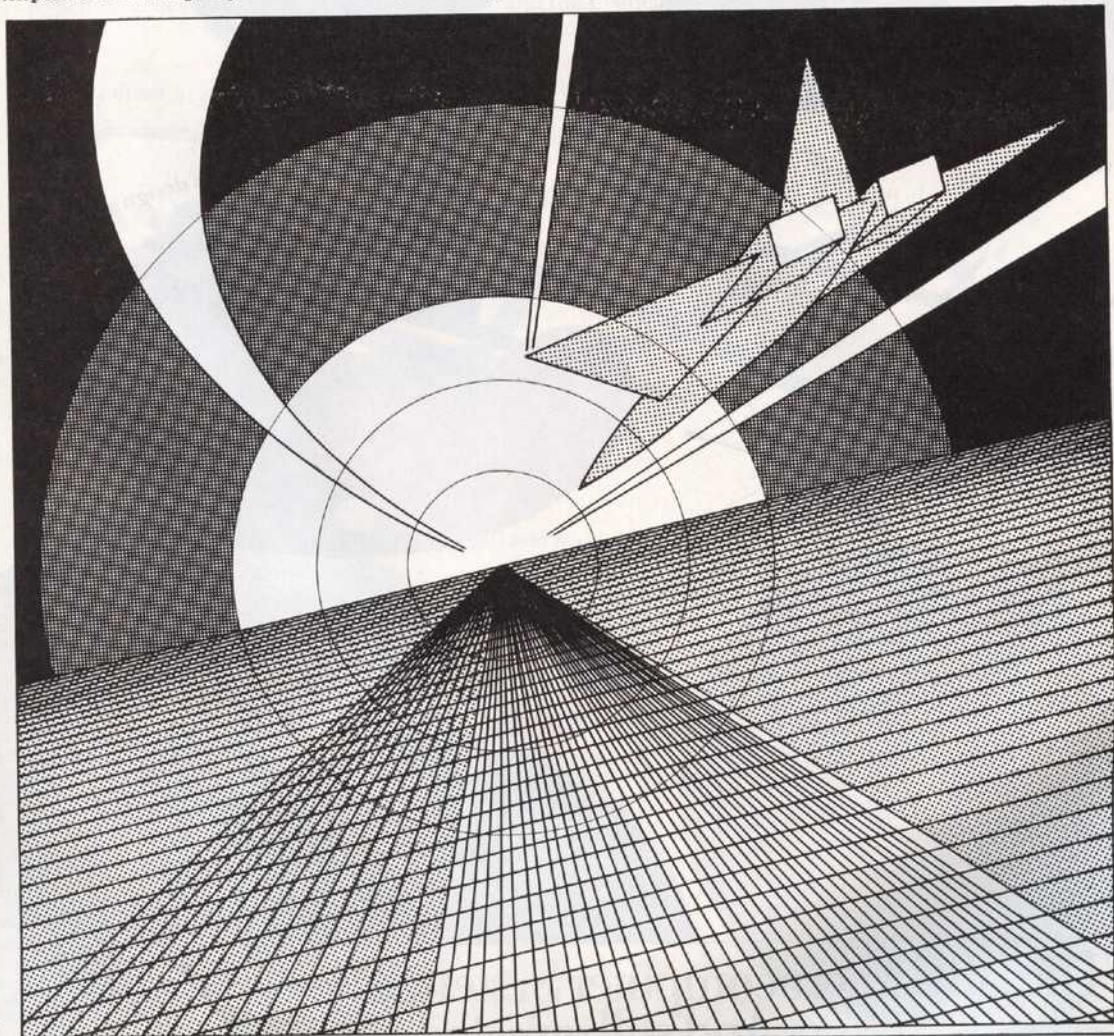
To enter the game, first enter the Basic program. Once you have done this, save it to tape using *Save "Gravitar" Line 9999*. Now type in the data for the character set using the hex loader. Save this using *Save "Characters" Code 64000, 472*.

When the game is run, the title page will appear. If this is left, the high score table and instructions will also be displayed. The object of the game is to go from planet to

planet destroying the bunkers and collecting the fuel with your tractor beam. Once all the bases have been bombed, you can leave the planet via the top of the screen.

If you crash you lose a ship, and the game ends when either all your ships are destroyed or you run out of fuel. You begin the game with three ships, and get an extra every 10000 points.

Happy shooting ...



Star Game

```

10 REM *****
20 REM *****
30 REM *****
40 REM *****
50 REM *****
60 REM *****
70 REM *****
80 REM *****
90 REM *****
100 REM *****
110 REM *****
120 REM *****
130 REM *****
140 REM *****
150 REM *****
160 REM *****
170 REM *****
180 REM *****
190 REM *****
200 REM *****
210 REM *****
220 REM *****
230 REM *****
240 REM *****
250 REM *****
260 REM *****
270 REM *****
280 REM *****
290 REM *****
300 REM *****
310 REM *****
320 REM *****
330 REM *****
340 REM *****
350 REM *****
360 REM *****
370 REM *****
380 REM *****
390 REM *****
400 REM *****
410 REM *****
420 REM *****
430 REM *****
440 REM *****
450 REM *****
460 REM *****
470 REM *****
480 REM *****
490 REM *****
500 REM *****
510 REM *****
520 REM *****
530 REM *****
540 REM *****
550 REM *****
560 REM *****
570 REM *****
580 REM *****
590 REM *****
600 REM *****
610 REM *****
620 REM *****
630 REM *****
640 REM *****
650 REM *****
660 REM *****
670 REM *****
680 REM *****
690 REM *****
700 REM *****
710 REM *****
720 REM *****
730 REM *****
740 REM *****
750 REM *****
760 REM *****
770 REM *****
780 REM *****
790 REM *****
800 REM *****
810 REM *****
820 REM *****
830 REM *****
840 REM *****
850 REM *****
860 REM *****
870 REM *****
880 REM *****
890 REM *****
900 REM *****
910 REM *****
920 REM *****
930 REM *****
940 REM *****
950 REM *****
960 REM *****
970 REM *****
980 REM *****
990 REM *****

```

```

3060 PRINT AT 17.0; INK 2;"
3070 PRINT AT 18.0; INK 2;"
3085 PRINT AT 19.0; INK 2;"
3095 PRINT AT 20.0; INK 2;"
3100 PRINT AT 21.0; INK 2;"
3110 PRINT AT 22.0; INK 2;"
3120 PRINT AT 23.0; INK 2;"
3130 PRINT AT 24.0; INK 2;"
3140 PRINT AT 25.0; INK 2;"
3150 PRINT AT 26.0; INK 2;"
3160 PRINT AT 27.0; INK 2;"
3170 PRINT AT 28.0; INK 2;"
3180 PRINT AT 29.0; INK 2;"
3190 PRINT AT 30.0; INK 2;"
3200 PRINT AT 31.0; INK 2;"
3210 PRINT AT 32.0; INK 2;"
3220 PRINT AT 33.0; INK 2;"
3230 PRINT AT 34.0; INK 2;"
3240 PRINT AT 35.0; INK 2;"
3250 PRINT AT 36.0; INK 2;"
3260 PRINT AT 37.0; INK 2;"
3270 PRINT AT 38.0; INK 2;"
3280 PRINT AT 39.0; INK 2;"
3290 PRINT AT 40.0; INK 2;"
3300 PRINT AT 41.0; INK 2;"
3310 PRINT AT 42.0; INK 2;"
3320 PRINT AT 43.0; INK 2;"
3330 PRINT AT 44.0; INK 2;"
3340 PRINT AT 45.0; INK 2;"
3350 PRINT AT 46.0; INK 2;"
3360 PRINT AT 47.0; INK 2;"
3370 PRINT AT 48.0; INK 2;"
3380 PRINT AT 49.0; INK 2;"
3390 PRINT AT 50.0; INK 2;"
3400 PRINT AT 51.0; INK 2;"
3410 PRINT AT 52.0; INK 2;"
3420 PRINT AT 53.0; INK 2;"
3430 PRINT AT 54.0; INK 2;"
3440 PRINT AT 55.0; INK 2;"
3450 PRINT AT 56.0; INK 2;"
3460 PRINT AT 57.0; INK 2;"
3470 PRINT AT 58.0; INK 2;"
3480 PRINT AT 59.0; INK 2;"
3490 PRINT AT 60.0; INK 2;"
3500 PRINT AT 61.0; INK 2;"
3510 PRINT AT 62.0; INK 2;"
3520 PRINT AT 63.0; INK 2;"
3530 PRINT AT 64.0; INK 2;"
3540 PRINT AT 65.0; INK 2;"
3550 PRINT AT 66.0; INK 2;"
3560 PRINT AT 67.0; INK 2;"
3570 PRINT AT 68.0; INK 2;"
3580 PRINT AT 69.0; INK 2;"
3590 PRINT AT 70.0; INK 2;"
3600 PRINT AT 71.0; INK 2;"
3610 PRINT AT 72.0; INK 2;"
3620 PRINT AT 73.0; INK 2;"
3630 PRINT AT 74.0; INK 2;"
3640 PRINT AT 75.0; INK 2;"
3650 PRINT AT 76.0; INK 2;"
3660 PRINT AT 77.0; INK 2;"
3670 PRINT AT 78.0; INK 2;"
3680 PRINT AT 79.0; INK 2;"
3690 PRINT AT 80.0; INK 2;"
3700 PRINT AT 81.0; INK 2;"
3710 PRINT AT 82.0; INK 2;"
3720 PRINT AT 83.0; INK 2;"
3730 PRINT AT 84.0; INK 2;"
3740 PRINT AT 85.0; INK 2;"
3750 PRINT AT 86.0; INK 2;"
3760 PRINT AT 87.0; INK 2;"
3770 PRINT AT 88.0; INK 2;"
3780 PRINT AT 89.0; INK 2;"
3790 PRINT AT 90.0; INK 2;"
3800 PRINT AT 91.0; INK 2;"
3810 PRINT AT 92.0; INK 2;"
3820 PRINT AT 93.0; INK 2;"
3830 PRINT AT 94.0; INK 2;"
3840 PRINT AT 95.0; INK 2;"
3850 PRINT AT 96.0; INK 2;"
3860 PRINT AT 97.0; INK 2;"
3870 PRINT AT 98.0; INK 2;"
3880 PRINT AT 99.0; INK 2;"
3890 PRINT AT 100.0; INK 2;"

```

```

3555 PRINT AT 7,8; INK 2; " " IN
R 1; INK 2; INK 2; " " AT 8,7
R 1; INK 2; INK 2; " " AT 9,8
7,8; INK 2; " " AT 10,4; INK
6; " " AT 9,10; INK 2; " "
3260 PRINT AT 10,6; INK 2; " "
AT 11,14; INK 5; INK 2; " " AT
11,25; " " AT 12,5; INK 2; " " AT 12,25
3265 PRINT AT 14,7; INK 2; " "
INK 6; " " INK 2; " "
INK 2; " " AT 18; INK 2; " " INK 2
INK 2; " " INK 6; " " AT 20; INK
INK 2; " " INK 1; " " INK 1; " " INK
3270 LET BUN=10; GO SUB 3010; RE
TURN
3300 INK 2; PRINT AT 1,12; " " AT 3,10;
" " AT 2,11; AT 4,9; " " AT
1,6; " " AT 5,8; " " AT 6,7; " "
3405 PRINT AT 9,6; " " AT 10,3; " "
3410 PRINT AT 11,2; " " AT 12,2; AT 12
3; " " AT 10,4; " "
3415 PRINT AT 15,5; " " AT 15,27;
" " AT 18,6; " " AT 18,27;
" " AT 18,20; " " AT 19,8; " " AT
19,28; " " AT 20,10; " " AT 19
20; " " AT 20,10; " " AT 20,10
3420 LET BUN=1; GO SUB 3010; R
TURN
3430 CLS; RESTORE 3460; FOR X=1
TO 6; REPEAT 8; FOR Y=1 TO LEN A;
5; PRINT PAPER (AS(Y)); " " AS(Y)
6; BEEP FOR Y TO 20; BEEP .01
Y; NEXT Y; NEXT X
3460 FOR I=2 TO SHIPS; NEXT I; PRIN
12; X=1; SHIPS=1; INK 1; PRIN
LORE=SCORE; SHIPS=1; INK 1; INK X
SCREEN=1; FOR X=1 TO 20; NEXT X
GO TO 1000
3500 DATA "MISSION COMPLETE"; "RE
ACTOR DESTROYED"; "TELEPORTING TO
NEW ORIGIN"; "BONUS 2000 FUEL UNITS";
18; "BONUS 2000 POINTS"; "LIVES 8
UNITS"
3510 INK 7; STOP
3520 PRINT AT 0,0; INK 6; OVER
1; " " BEEP 1; " " BEEP 0; B
1; " " BEEP 1; " " BEEP 2; " " B
EEP 0; BEEP 1; " " BEEP 1; " " SHIPS
3530 LET SHIPS=SHIPS-1; IF SHIPS
0 THEN GO TO 1000
3540 PRINT AT 9,11; "GAME OVER";
FOR X=1 TO 200; NEXT X
3550 CLS; FOR X=1 TO 5; IF N(Z)
SCORE THEN GO TO 4050
3560 NEXT X; GO TO 4100
3570 PRINT AT 0,12; "ERRITAR"; F
OR X=1 TO 5; FOR Y=7 TO 7; PRINT
AT 8,14; INK Y; WELL DONE; PRI
NT AT 8,14; INK Y; WELL DONE; PRI
NT AT 8,14; INK 4; INK 4; YOU
HAVE QUALIFIED FOR THE
INK 7; "ERRITAR"; INK 5; "HULL 0
TO 1000"; PRINT AT 13,0; "ENTER THY H
OME (MAX 10 CHARS)"; INPUT LINE
H$; IF LEN H$ > 10 THEN BEEP .1;
10; GO TO 4070
4080 FOR V=4 TO 2 STEP -1; LET H
(Y,1)=H(Y); NEXT Y; LET H(Z)=SC
RE; LET H(Z)=H$
4100 GO SUB 3060; GO TO 300
4200 CLS; PRINT AT 10,1; "GAME
OVER"; AT 12,14; INK 6; "AT 10,10; F
OR X=1 TO 200; NEXT X; GO
TO 4035
4210 LET SCORE=0; GO TO LET SCREEN=1
7020 LET DEL=1000; GO TO SHIPS=3
7040 LET EXTRA=1000; 7050 RETURN
3000 BORDER 0; PAPER 0; INK 7; L
S; PRINT AT 0,4; "IN PROGRM PR
OGRAMS"
3010 FOR X=1 TO 8; FOR Y=1 TO 7;
BEEP AT 2,4; BEEP 1; BEEP 0; Y+2;
4; NEXT 0; NEXT 2; PRINT AT 2,1
3020 INK 6; "ERRITAR"; INK 4; " " IN
K 2; " " 1984; " " INK 5; " " IN PROGRM
3030 PRINT AT 11,0; INK 5; "OBJEC
T FUNCTION SCORE"
3040 PRINT AT 13,2; INK 2; " " I
NK 6; " " BEEP BONUS
INK 7; " " +250; " " AT 15,2; INK 1; " "
INK 6; " " F+100
3050 LET L=0; GO TO 8200
3060 CLS; PRINT AT 0,0; INK 6;
PAPER 1; "ERRITAR IMMORTAL
LS
" " INK 7; " " PLAT 0; 175; 0
0; DRAM 0; 23; DRAM -255
0; DRAM 0; 23
3070 PRINT AT 5,0; INK 2; "RANK
SCORE"
3080 PRINT
3090 FOR X=1 TO 5; PRINT; PRINT
INK 8-X; " " AT 5; PRINT; PRINT
" " AS(X); " " IN 5; (LEN STR# 1

```

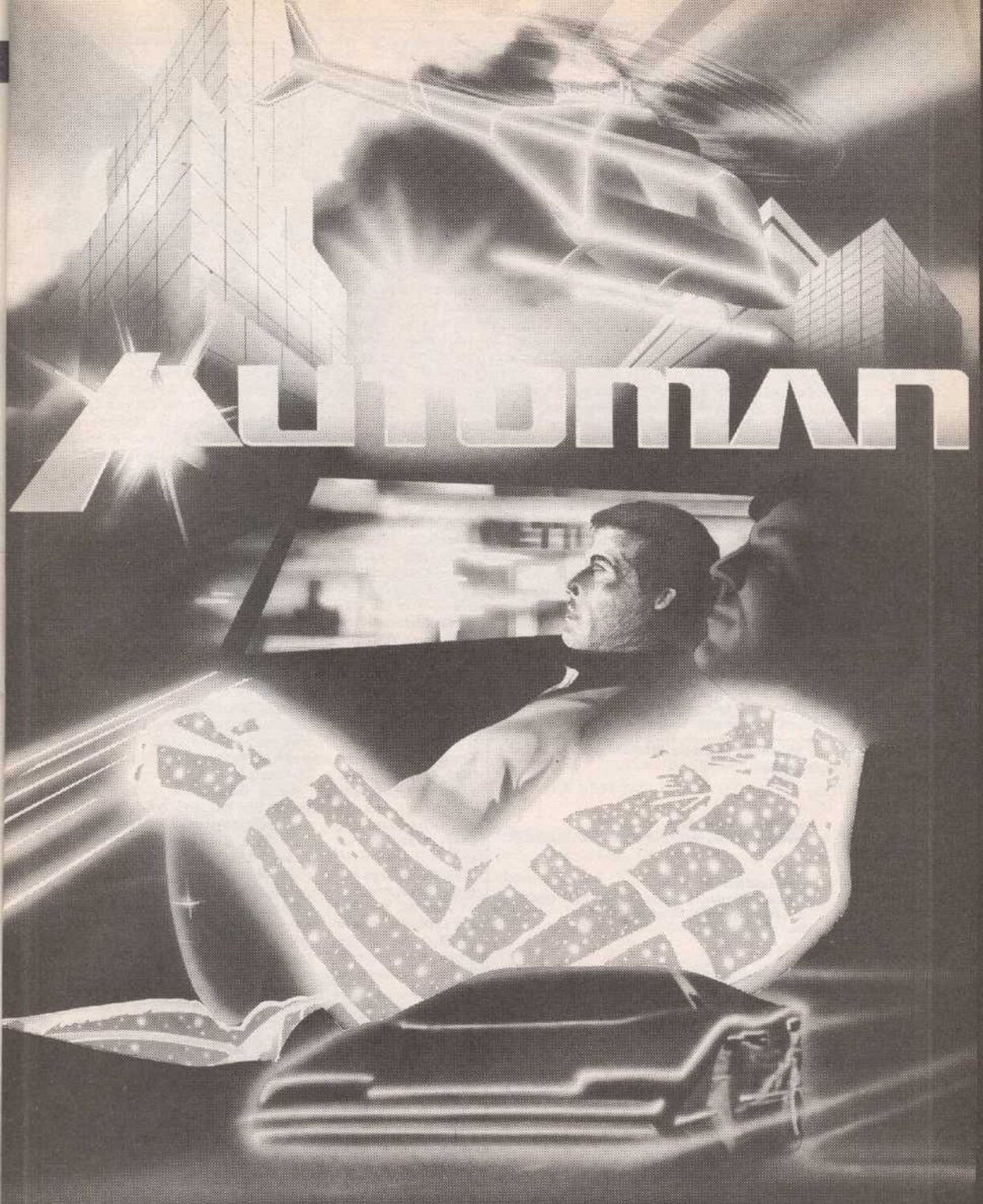
```

(X); INK 7; NEXT X
8100 LET L=8110; GO TO 8200
8110 CLS; PR INK 4; "KEYS"; "ERRIT
AR"; " " INK 4; INK 4; "KEYS"; "KEY
8120 PRINT AT 6,0; INK 5; "KEY
FUNCTION
" " INK 6; " " INK 6; " "
5010 LEFT; " " AT 11,0; INK 3; " "
SHIP RIGHT; AT 13,0; INK 3; " "
THRU SHIP; AT 15,0; INK 3; " "
DROP BOMB; AT 17,0; INK 4;
" " INK 6; " " INK 6; " "
8140 LET L=8150; GO TO 8200
8150 PRINT AT 2,2; FLASH 1; "PRE
SS 8 KEY TO PLAY; ERRITAR";
8210 FOR X=1 TO 1000; IF INKEYS=
" " THEN NEXT X; GO TO L
8220 RETURN
8300 DIM M$(5,10); DIM N$(5); FOR
X=1 TO 5; LET M$(X,1)="ERRITAR";
LET N$(X)=(6-X)*5000; NEXT X-1;
8310 FOR X=0; FOR Y=0; NEXT Y
8320 DATA 255,0,0,0,0,0,0,0,0
8330 DATA 0,0,0,0,0,0,0,0,255
8340 DATA 1,1,1,1,1,1,1,1,1,1
8350 DATA 128,128,128,128,128,128
8360 DATA 1,2,4,8,16,32,64,128
8370 DATA 128,64,32,16,8,4,2,1
8380 DATA 36,60,24,60,60,60,60,2
8390 DATA 0,0,0,0,0,0,0,0,1,69
8400 DATA 60,161,161,209,171,213,
156,60
8410 DATA 24,24,36,36,68,129,189
66
8440 DATA 255,64,32,16,8,4,2,1
8450 DATA 255,2,4,8,16,32,64,128
8460 DATA 1,2,4,8,16,32,64,255
8470 DATA 128,64,32,16,8,4,2,255
8480 DATA
8490 BORDER 0; PAPER 0; INK 0; C
LS; CLEAR 63999; LOAD "LOAD
PUKE 8; 8; 8; PUKE 23607,849; IN
K 7;
5; CLEAR 63999; LET AS=10; LET
B=11; LET C=12; LET D=13; LET E=
14; LET F=15
10; POKE 23656,8; FOR X=64128 T
O 64471;
15; INPUT STR# X$; " " LINE AS
0; IF LEN AS < 2 THEN BEEP .1; 0; G
O TO 15
20; PRINT X AS; POKE X,VAL AS(1
)+16*VAL AS(2)
25; NEXT X

```

The Hex Loader Program

Address	Hex	Loader	Program	Hex
0000	00	00	00	E8
0001	00	00	00	7E
0002	00	00	00	10
0003	00	00	00	1B
0004	00	00	00	00
0005	00	00	00	00
0006	00	00	00	00
0007	00	00	00	00
0008	00	00	00	00
0009	00	00	00	00
000A	00	00	00	00
000B	00	00	00	00
000C	00	00	00	00
000D	00	00	00	00
000E	00	00	00	00
000F	00	00	00	00
0010	00	00	00	00
0011	00	00	00	00
0012	00	00	00	00
0013	00	00	00	00
0014	00	00	00	00
0015	00	00	00	00
0016	00	00	00	00
0017	00	00	00	00
0018	00	00	00	00
0019	00	00	00	00
001A	00	00	00	00
001B	00	00	00	00
001C	00	00	00	00
001D	00	00	00	00
001E	00	00	00	00
001F	00	00	00	00
0020	00	00	00	00
0021	00	00	00	00
0022	00	00	00	00
0023	00	00	00	00
0024	00	00	00	00
0025	00	00	00	00
0026	00	00	00	00
0027	00	00	00	00
0028	00	00	00	00
0029	00	00	00	00
002A	00	00	00	00
002B	00	00	00	00
002C	00	00	00	00
002D	00	00	00	00
002E	00	00	00	00
002F	00	00	00	00
0030	00	00	00	00
0031	00	00	00	00
0032	00	00	00	00
0033	00	00	00	00
0034	00	00	00	00
0035	00	00	00	00
0036	00	00	00	00
0037	00	00	00	00
0038	00	00	00	00
0039	00	00	00	00
003A	00	00	00	00
003B	00	00	00	00
003C	00	00	00	00
003D	00	00	00	00
003E	00	00	00	00
003F	00	00	00	00
0040	00	00	00	00
0041	00	00	00	00
0042	00	00	00	00
0043	00	00	00	00
0044	00	00	00	00
0045	00	00	00	00
0046	00	00	00	00
0047	00	00	00	00
0048	00	00	00	00
0049	00	00	00	00
004A	00	00	00	00
004B	00	00	00	00
004C	00	00	00	00
004D	00	00	00	00
004E	00	00	00	00
004F	00	00	00	00
0050	00	00	00	00
0051	00	00	00	00
0052	00	00	00	00
0053	00	00	00	00
0054	00	00	00	00
0055	00	00	00	00
0056	00	00	00	00
0057	00	00	00	00
0058	00	00	00	00
0059	00	00	00	00
005A	00	00	00	00
005B	00	00	00	00
005C	00	00	00	00
005D	00	00	00	00
005E	00	00	00	00
005F	00	00	00	00
0060	00	00	00	00
0061	00	00	00	00
0062	00	00	00	00
0063	00	00	00	00
0064	00	00	00	00
0065	00	00	00	00
0066	00	00	00	00
0067	00	00	00	00
0068	00	00	00	00
0069	00	00	00	00
006A	00	00	00	00
006B	00	00	00	00
006C	00	00	00	00
006D	00	00	00	00
006E	00	00	00	00
006F	00	00	00	00
0070	00	00	00	00
0071	00	00	00	00
0072	00	00	00	00
0073	00	00	00	00
0074	00	00	00	00
0075	00	00	00	00
0076	00	00	00	00
0077	00	00	00	00
0078	00	00	00	00
0079	00	00	00	00
007A	00	00	00	00
007B	00	00	00	00
007C	00	00	00	00
007D	00	00	00	00
007E	00	00	00	00
007F	00	00	00	00
0080	00	00	00	00
0081	00	00	00	00
0082	00	00	00	00
0083	00	00	00	00
0084	00	00	00	00
0085	00	00	00	00
0086	00	00	00	00
0087	00	00	00	00
0088	00	00	00	00
0089	00	00	00	00
008A	00	00	00	00
008B	00	00	00	00
008C	00	00	00	00
008D	00	00	00	00
008E	00	00	00	00
008F	00	00	00	00
0090	00	00	00	00
0091	00	00	00	00
0092	00	00	00	00
0093	00	00	00	00
0094	00	00	00	00
0095	00	00	00	00
0096	00	00	00	00
0097	00	00	00	00
0098	00	00	00	00
0099	00	00	00	00
009A	00	00	00	00
009B	00	00	00	00
009C	00	00	00	00
009D	00	00	00	00
009E	00	00	00	00
009F	00	00	00	00
00A0	00	00	00	00
00A1	00	00	00	00
00A2	00	00	00	00
00A3	00	00	00	00
00A4	00	00	00	00
00A5	00	00	00	00
00A6	00	00	00	00
00A7	00	00	00	00
00A8	00	00	00	00
00A9	00	00	00	00
00AA	00	00	00	00
00AB	00	00	00	00
00AC	00	00	00	00
00AD	00	00	00	00
00AE	00	00	00	00
00AF	00	00	00	00
00B0	00	00	00	00
00B1	00	00	00	00
00B2	00	00	00	00
00B3	00	00	00	00
00B4	00	00	00	00
00B5	00	00	00	00
00B6	00	00	00	00
00B7	00	00	00	00
00B8	00	00	00	00
00B9	00	00	00	00
00BA	00	00	00	00
00BB	00	00	00	00
00BC	00	00	00	00
00BD	00	00	00	00
00BE	00	00	00	00
00BF	00	00	00	00
00C0	00	00	00	00
00C1	00	00	00	00
00C2	00	00	00	00
00C3	00	00	00	00
00C4	00	00	00	00
00C5	00	00	00	00
00C6	00	00	00	00
00C7	00	00	00	00
00C8	00	00	00	00
00C9	00	00	00	00
00CA	00	00	00	00
00CB	00	00	00	00
00CC	00	00	00	00
00CD	00	00	00	00
00CE	00	00	00	00
00CF	00	00	00	00
00D0	00	00	00	00
00D1	00	00	00	00
00D2	00	00	00	00
00D3	00	00	00	00
00D4	00	00	00	00
00D5	00	00	00	00
00D6	00	00	00	00
00D7	00	00	00	00
00D8	00	00	00	00
00D9	00	00	00	00
00DA	00	00	00	00
00DB	00	00	00	00
00DC	00	00	00	00
00DD	00	00	00	00
00DE	00	00	00	00
00DF	00	00	00</	



Commodore 64

Officially Licensed from



BUG-BYTE



Bug-Byte Limited, Mulberry House, Canning Place, Liverpool L1 8JB. Telephone: 051-709 7071.

Oric's IQ test

Christina Erskine talks to Bruce Everiss of Tansoft

Bruce Everiss reminds me of Mr Micawber. He always turns up. His latest appearance has been in the role of managing director of Tansoft, the Cambridge-based company now owned by Oric directors Barry Muncaster and Paul Johnson. This follows a number of Bruce sightings, as both a computer journalist and Yamaha's representative for the CX5 micro, since the demise of Imagine where he was operations director.

Bruce was appointed a month ago, following the departure of former Tansoft directors Paul Kaufman, Cathie Burrell and Geoff Philips.

His brief is not only to develop the software company, but to take charge of all Oric's marketing including three new machines due out early in the New Year. The successor to the Atmos, the IQ164, a portable model and an IBM Pc compatible machine.

"To talk of three new machines from Oric is a little misleading," said Bruce. "The new one is really the Pc-compatible series, for which we have designed the chips in-house — we have a chip set for the Pc compatible that uses half the components normally used.

"Oric's Pc will actually consist of two machines, similar to the two Advance models. The basic micro will have a

cassette interface and can be used as a home computer. However, we're looking at the possibility of waferdrives and quickdiscs for data storage."

The quickdisc is being considered as a cheap alternative to microdrives or more conventional disc drives. The mechanism is extremely simple, the 3½ inch disc rotated by a single motor, the head moving across from edge to centre on a plastic peg. Each one has a capacity of 64K per side. According to Bruce, several Japanese companies are planning to introduce quickdiscs for machines in the UK.

"With the IBM Pc compatible version of the micro, we're looking at Winchester and hard discs, of course."

The lap-held machine is not an Oric manufactured product, though Oric, through Barry Muncaster and Paul Johnson, have contributed to its design. "We also have a specific Local Area Network designed and ready to put into the machine," the machine is made by a US company and Oric is putting its name to it in the UK.

"This is definitely a machine aimed at the travelling company executive. You'll be able to load half a megabyte into Ram, it will have an 80 x 25 Hitachi screen display, so it's not aimed at the lower end of the market."

I wondered if it was being brought out deliberately before Sinclair launches its portable model. Bruce didn't seem to think Sinclair posed much of a problem.

"Sinclair's will be an inexpensive, simple machine — ours will be priced around £3000 and is a professional machine — after all, the display alone costs £1000 to put in. It's going to be more in line with the Data General 1.

"And as for the launch of the new products, it may not be as originally planned, now that I've come in to co-ordinate the marketing. Remember, I'm still in my first month at Tansoft."

We talked about the IQ 164, the forthcoming home micro and follow-up to the Atmos. "It will be a bigger machine



than the Atmos, and much more powerful. The Microsoft Basic has been extended to include commands for 3D graphics and sound. The Atmos will continue in the market place, where I see it in direct competition with, say, the Electron."

The IQ 164 contains custom ULAs to control video, Ram refresh, address decoding, memory paging, bus buffering and logic functions.

"The machine will have 64K Ram and while it has no internal Rom, there are two Rom cartridge slots on the upper right hand side of the keyboard for applications and language programs."

The language cartridge can contain up to 64K and the applications cartridge up to 48K. "A Basic cartridge will be bundled with the machine at launch, and Logo will also be available."

The IQ 164 will be heavily pushed in the European market, where Oric has had far more success than in the UK. It is set for launch in France, as the Stratos, before the UK launch.

Before the launch of new products, Bruce's first job is to build up Tansoft. "I need to get together a first class team of staff here. Then, it's a case of expanding the software base.

"My policy is to establish a large catalogue of software, both for the Oric and other machines, and then add to that catalogue very selectively with quality products and delete the ones that aren't doing so well. Although Tansoft has not produced software for machines other than the Oric models so far, I am happy to convert to and from the Atmos if there is a demand.

"I've recently bought the entire catalogue from Voyager Software — most of which are fairly run-of-the-mill arcade games, but they've been modified and I'll use them all for Tansoft."

Bruce also had some interesting things to say about Oric manufacturing policies. "We're quite happy to let other companies test and define the market before we join in. If Sir Clive Sinclair finds a huge new market with the QL, then Oric will release its version of the machine. As the industry becomes more mature, we don't really want to take too many risks; we're more interested in making money."

These list the enhanced software features of the IQ 164 over the Oric Atmos

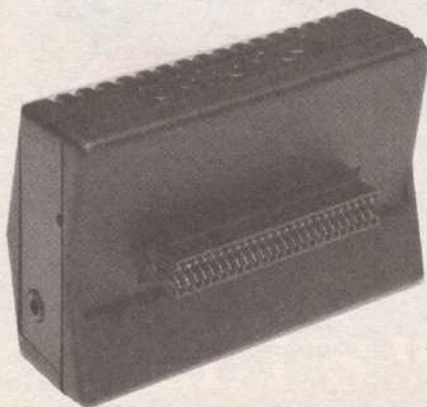
Renun	
Auto	
Ed	a modified screen editor
IRS232	used to define the parameter of the serial I/O channel
Slist	
Sprint	
Sinput	read serial input
Setfun	used to define the function of each key when combined with the Funct key. Basic single key entry.
Gload	load game cartridge
Absdraw	
Move 3D	
Draw 3D	
Adraw 3D	
Dset 3D	
Paint	
Splot	
Ellipse	
Eval	a new string handling instruction
Gdir	game cartridge directory
Env	a new sound command to synthesise waveforms
Note	a new sound command
English	
French	
Delete	delete lines of programs in Basic
Ecload	new super cassette system
Xsave	
Xload	
Xstore	for modem communication to other Orics
Srecall	
Atmos	initialise IQ 164 to 100% compatibility with Oric Atmos
Esave	

Amstrad Speech Synthesizer!



The dk'tronics Amstrad speech synthesizer and powerful stereo amplifier uses the popular SLO/256 speech chip and has an almost infinite vocabulary. It is supplied with a text to speech converter for ease of speech output creation. Everything you wish to be spoken is entered in normal English, without special control codes or characters, it is therefore extremely easy to use. The voicing of the words is completely user transparent and the computer can carry on its normal running of a program while the speech chip is talking. The speech output from SLO/256 is mono and directed to both speakers. To utilise the Amstrad stereo output on the back of the computer, the interface has a built in stereo amplifier, this gives all sound output a totally new dimension and greatly improves the sound quality and volume over the computer's internal speaker.

Although there are only 26 letters in the alphabet, letters have a totally different sound when used in different words. For example, The "a" in Hay is much longer and softer than in Hat. When you speak you automatically make adjustments because you know just how a word should sound. Not quite so easy with a computer. After looking at other speech synthesizers we decided that it was essential that the dk'tronics Amstrad Speech would offer a simple system that would enable the user to produce realistic speech that was instantly recognisable.



The solution to the problem was extremely complicated, it required hours of programming to enable the computer to look at the individual letters that make up each word and compare their relative position to each other before deciding on the appropriate sound.

I am delighted that we have now perfected what I consider to be the best Speech Synthesizer on the market, one which has achieved my aim, within the limitations of the allophones, of producing realistic speech.

At only **£39.95** the dk'tronics Amstrad Speech Synthesizer represents remarkable value for money.

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

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

Multi-tasking

Hardware The XP memory expansion system **Price** £15.95 **Supplier** TV Services, Chesterton Mill, French's Road, Cambridge.

A four megabyte, multi-tasking Spectrum? If you can afford the Ram, that's one of the possibilities presented by the XP expansion board, which gives the facility to add up to 128 extra pages of memory, each of 32K.

The XP system comes in two parts: the hardware has been developed by the ingenious Steven Adams, while Andy Pennell has written software that allows multi-tasking and windowing. For £15.95 you receive the software and a ready-built, three by one inch, circuit board which hosts five ICs, two resistors and a capacitor. Fourteen wires need to be connected between the PCB and the computer, some attaching to the board and others to IC pins. A certain amount of track cutting is also necessary.

Although the instructions are reasonably clear, installing the kit is not a job for beginners, particularly as there are at least four types of Spectrum circuit board. Sending your machine away to have the board fitted only costs £5 extra (plus postage), which must be the bargain of the month.

The chips are standard TTL items — NOR gates and flip-flops — and are arranged to react as an I/O port. Bit 1 of the I/O address is all that is used in the decoding process: the "official" address of the port is 253. There are three possible states that can be produced by writing data to the port. Any value over 127 allows external Ram pages to occupy the top 32K of address space. 126 will enable the normal upper 32K; 127 selects another 32K block of Ram already contained onboard the Spectrum, although this last block may not be complete, or not even work at all.

Confused? What extra 32K am I talking about? The 48K Spectrum has two groups of Ram chips. The addresses &H4000 to &H7FFF are serviced by a batch of 16K chips, while &H8000 upwards uses eight 32K bit ICs, which are in fact 65K bit chips that are faulty, with one or more duff bits in either the upper or lower half. Sort these into batches of "high" and "low" and you have a supply of 32K bit Ram chips.

These were not always available, so some Spectrums were fitted with perfect 64K chips, while others may have quite a lot of usable "alternative" Ram. The suggestion is that over half the machines fitted with the XP board have a decent amount of extra Ram.

The designer makes it clear that there are no guarantees; it is possible to fit 64K chips to ensure an additional internal bank of memory, but the main purpose of the XP

circuitry is to keep the internal Ram refreshed while external Ram packs are switched into place. The first pack available will contain two 32K banks and cost under £100, while technically-minded Spectrum owners will be able to convert existing 32K extension packs to suit the system.

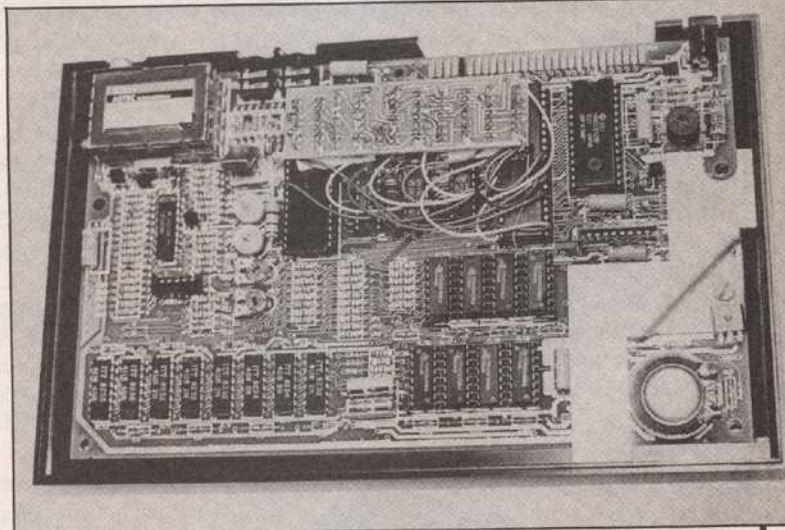
With the board fitted a Spectrum behaves just like any other, providing you leave I/O port 253 alone. So far, only one commercial program has been found to crash — one of the Ultimate games. To use extra banks, Ramtop must be lowered to &H7FFF, leaving you with a 16K Spectrum, otherwise switching off the normal page will cause Basic to lose its stack (a very sorry state of affairs).

You may be wondering how it is possible to benefit from the hardware; the answer lies in the software. This is supplied on cassette and loads into the non-switched Ram: it searches the external world for working pages and each one that it finds is set up so that it resembles the Basic program area. You are then placed in the home page, with almost 32K available for programs and a number of extra commands at your disposal. These normally take the

include that page as the next in the chain: you end the chain by giving the last page's number again. If you now run the first program all the programs in the chain will run. The software, running in interrupt mode 2, allows one program to run for a fixed period of time, followed by another, and so on. Certain operations pause the multi-tasking as they disable interrupts, such as *Beep* and cassette commands. *Input*, *Save* and error messages halt multi-tasking and it must be restarted. It's just as well that *Input* does — two input commands running at the same time would be rather awkward!

Windows are implemented with a command that has four parameters defining the top left corner of the window and its size. Sinclair Basic programs take these as the limits for character (but not graphic) output, each page having its own window. It can be argued that these are not "true" windows, as when they overlap neither covers up the other, and scrolling a large window will move the contents of any smaller windows within the area. The same argument applies to QL windows.

Passing variables between programs is



Spectrum fitted with XP memory expansion circuit board.

form of *Randomize Usr* statements, with any parameters following in a *Print* statement.

However, owners of an Interface 1 will find that extra command words have been created for their convenience. It is possible to switch to another page (even an unusable one), *New* the current page and stop a program running in another page.

The most interesting commands allow multi-tasking and windowing. *Multi 0* or its *Randomize* equivalent clears the multi-tasking. Putting a *Multi* statement at the beginning of each page's program with a valid page number as a parameter will

made possible because there is space in the lower section of memory which can be accessed by any program. A planned enhancement to the system will also allow Roms to be paged into memory.

To get two programs running concurrently on the Spectrum is quite an achievement; the possibility of getting 32K of additional Ram, at a price of £20.95 (or £15.95 if you fancy your chances with the kit) make this one of the most exciting additions to the Spectrum to date.

Jeff Naylor

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

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

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

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

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

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

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

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

Eureka!

TELL US WHAT YOU THINK.

Safety in numbers

Which MSX? Jeff Naylor separates the peas from the pod



MSX certainly has its disadvantages. But it also has some good things going for it.

The current pricing structure for the Japanese micros is definitely a serious drawback but, that aside, the attractions of the system are considerable.

Using a Z80 CPU may be considered by some to be old hat, but there are plenty of programmers who can write software for it.

MSX may lack an 80-column display or very high resolution graphics, but the sprites that are available are easily manipulated from Basic to more than compensate the games programmer.

Extended Microsoft Basic may not have anything to offer the structured language enthusiast, but its sound and graphics commands, high-precision arithmetic and interrupt structures make it a powerful language.

Value for money? At present that is certainly questionable. The quality of many of the machines goes some way to justify their price — blame the rest on

a strong Yen. And, as long as you trust the companies to stick to their promises, the standardisation carrot is very attractive.

The MSX design standard is very well known now so I shan't go into much detail.

Nevertheless, if you have got as far as thinking that you want to buy an MSX machine, then there are still decisions to be made. Although the machines are very similar, small differences in specification and manufacture allow distinctions to be drawn; some users will find use for an RGB socket, for example, while people intending to spend a good deal of time hammering away at a keyboard should examine it with care. If a computer is to invade the living room, then with the choice available there is no need to buy one that is aesthetically offensive either to you or the other inhabitants.

Collecting seven computers together and making judgements on their relative merits does involve personal

opinions, particularly when they all share the same standard, so my comments concerning subjective matters such as styling and keyboards should be backed up with visits to computer stores.

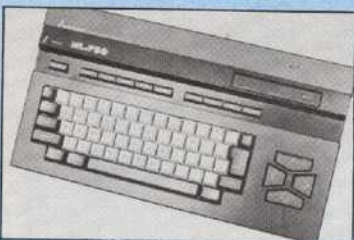
All the seven have 64K of Ram, on top of the 16K of video memory, but 32K machines have no less Ram available to Basic. To use the extra memory that lies under the Rom requires machine-code tricks, and I am not yet aware of any software that will not run on a 32K computer.

Neither the Yamaha nor Hitachi machines have been considered here. The Yamaha costs over £500 and comes with a music keyboard; the Hitachi is being sold as a portable business machine and is priced over £350.

Both are therefore pitched into slightly different areas of the market and cannot justifiably be compared directly with the other seven MSX micros.

Also, neither machine is likely to be available before next week.

Mitsubishi ML F80 — £299



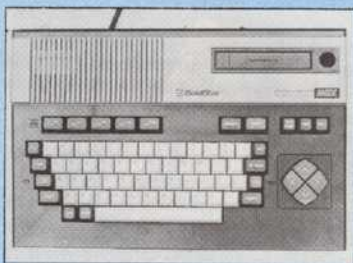
The styling of the Mitsubishi is in a decidedly high-tech vein — sleek and modern.

The keyboard has not succumbed to the design, however, being composed of normal keys the action of which is quite respectable. Layout is pretty standard: the return key is fairly large and well placed,

the shifts are of a good size, and the caps-lock has a built-in indicator light. It is the function, editing and cursor controls which are a victim of the designer trying to achieve looks rather than ergonomics. It is not their size and shape that is the problem, but their short action. Not quite as bad as some machines, maybe, but still poor.

Inside the ML F80, the standard of construction is quite respectable. The power supply is small and efficient and the usual separate Pal TV encoder board is evident. There are two Rom slots available, the one at the rear doubling as an expansion bus connector. Neither slot is guarded by a microswitch to cut off power when a cartridge is inserted, and the rear slot is rather wobbly. As would seem sensible, the slot on the top of the machine has priority over the rear port.

Goldstar FC 200 — £230



Price is this machine's most important feature, but to some extent this is unfortunately reflected in the quality of construction.

The FC 200 is very similar to the Toshiba HX-10 in terms of styling — simple and well proportioned, but the most obvious difference lies in keyboard. This is not too well laid out, with keys such as *Ctrl* and *Code* unusually placed. The return key is the worst example — not only is it too small, but is sited so high up that it is hard to find.

The shift keys also suffer from being a little too small. The keys have a rather dead feel to them. A problem exists with the lack of a pound symbol; there is one in the character set, but not engraved on any of the keys.

Inside, the impression that this computer was not built by a Japanese company — it is Korean — is perpetuated. Although perfectly acceptable, the printed-circuit board does not have that well-produced look of its Japanese counterparts. Instead of the single 32K Rom used by the other MSX computers, the Goldstar has two 16K Eproms, which at least gives it a higher scrap value!

Slightly perturbing is the use of insulating tape, rather than rubber sleeving, to shield the back of the mains switch.

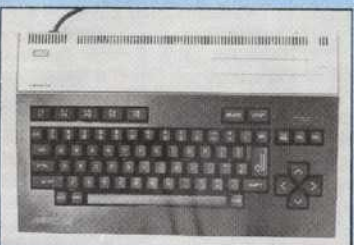
The single Rom port is microswitch protected, and seemed stiff when inserting or trying to remove a cartridge. Alongside is the machine's 'special' feature — a hole proudly labelled 'Pen Holder'.

Goldstar is not a member of the UK MSX working party, and when it released the FC200 it caused a stir, being priced almost £50 less than its nearest Japanese rival.

will find the joystick sockets well placed on the front edge, and two unprotected Rom ports.

The side port doubles as the expansion socket and has priority of the top slot. This seems the wrong way round to me.

Sanyo MPC 100 — £299.95



Clothed in black and silver, with white legends on black keys, the styling of the Sanyo is simple and uncluttered. The layout and feel of the keyboard is very pleasant; I personally liked its Qwerty keys, and the special keys do not lag far behind: even the cursor keys are a good compromise between programming and

games use. The space bar is particularly wide, and the caps-lock key lights up.

Construction is to a high standard, but one rather nasty bodge spoils an otherwise well made printed-circuit board — this may be unique to the review machine, though. The standard video pcb found in other Japanese models goes one stage further and not only contains the modulator but also slots in place rather neatly. The power supply is lightweight. It is interesting to see — if rather pedantic — that the MPC 100 has a rated power consumption of 11 watts, whereas the Goldstar uses 20 and the Sony 24 watts. The Sanyo will run for 90 hours, rather than about 50, on six pence worth of electricity!

There is only one Rom port, protected by a microswitch, so the expansion bus is of a "non-standard" variety. A reset button is provided.

stop, as the effects of the stylist have left the machine with a decidedly plastic look which stems mainly from the design of the control keys. Lying in a flush line across the top of the main keyboard they are ugly and ungainly in operation.

The cursor keys are worse: virtually no travel makes them a pain to use, even for games, but they still rattle. The Qwerty keys are much better, but still not as good as other machines. Even the space bar is too short.

The reason for the Canon's weight (a large mains transformer) has counter-productive effects; hold down a shift key and you become aware of a gentle vibration running up your arm. I suppose it makes the 'Power On' LED indicator redundant! Apart from the sub-station sized transformer, the case houses a well produced pcb. Back outside the case, you

Canon V-20 — £280



The Canon is a solid computer that sits firmly and purposefully on a desk, housed in a black, rounded case. Unfortunately that is where the compliments

Toshiba HX-10 — £279.95



The HX-10 is pleasantly styled, with a nicely produced case. The keyboard is one of the best in terms of feel, while the layout produces no surprises. You could

quibble about the size of the shift keys, and the cursor controls are rather tightly grouped for games use.

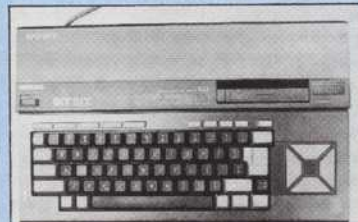
The standard Pal TV signal encoder board is evident inside the case, and the pcb is well made and neatly laid out. Quite a hefty mains transformer — giving the machine some substance — sits in the back left corner. The Toshiba has just one Rom slot, again protected by a switch, so the expansion bus is non-standard. I reviewed the HX-10 a few weeks ago, and referred to it as a typical MSX computer. Examining the other available machines reinforces this opinion — it is well made, with no special features.

editing keys are so small, with a short action. A reset switch is also placed on the top row and has a raised surround, but Mr Clumsy still managed to hit it instead of back-space on one occasion. Cursor keys are well spaced but also suffer from a short throw.

Shielding is evident inside the machine, although not to the same standard as the JVC. The general quality of manufacture is very high, and a big mains transformer gives substance without vibrating. Two Rom ports are provided, with the one on top having priority, but neither are fitted with a microswitch; at least Sony have provided a warning sticker.

An RGB socket is fitted to the back of the machine. A further enhancement is a built-in Rom program that provides simple data handling — memos, addresses and so on, in the form of a filing system. This is menu driven and very easy to use. When powered up without anything in the Rom slots you are presented with a menu for the data program that also allows you to access Basic.

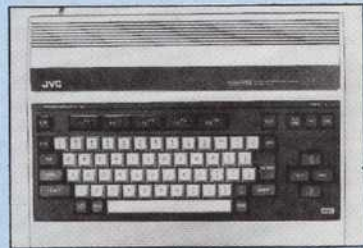
Sony HB-75 — £299



The Sony is the most purposeful looking of the computers.

With the case being mainly black, it has an air of quality and substance, despite being plastic. The Qwerty keyboard leaves nothing to be desired — there are even pips on the F and J keys for touch typists — and the tactile qualities are first class. It is a bit unfortunate though that the function and

JVC HC-7 — £279



The designer of this computer was obviously told to produce something that looked futuristic.

The result looks like a hump-backed whale with the flight deck of the Starship Enterprise stuck on its back (which is not to say that it won't be to someone's taste). The keyboard has a rake and curve which may, or may not, help to speed up typing. Apart from this, the keys are well laid out and feel fine. The function and editing keys are very sensible, with Stop being placed out of harm's way.

The JVC is not just well made. Taking it apart is like breaking into Fort Knox. This computer has been built to meet US radio interference regulations so everything is shielded, from the power supply to the back of the keyboard. Because of the unusual styling, there is no Rom slot on top of the machine. One lurks at the back and the other, which has priority, is on the right-hand side. Both are protected by microswitches.

An additional connector is provided which supplies RGB signals, so connecting a monitor is possible, though the 40-column resolution of the MSX system is quite at home with an ordinary TV set.

The Verdict



Now to put my head on the block — for what its worth, my personal assessment of the seven machines is:

- 1 Sony HB-75 £299
- 2 Sanyo MPC 100 £299.95
- 3 Toshiba HX-10 £279.95
- 4 Mitsubishi ML-F80 £299
- 5 JVC HC-7 £279
- 6 Goldstar FC 200 £230
- 7 Canon V-20 £280

I have assumed that the price factor is not as important as quality of construction — otherwise why buy an MSX — and so the Goldstar doesn't feature in the top five.

The Sanyo might have made it to first place if not for the Sony's built-in data handling program, while the JVC loses out because I personally didn't care for its styling. I offer no excuses for putting the Canon last — I just didn't like it as much. It didn't feel quite right.

The only question remaining is, if Nissan bring out an MSX machine, will it have a cigar lighter as standard?

Lateral

Program *The Witch's Cauldron* **Price** £5.95 **Micro** Spectrum 48K **Supplier** Mikro-Gen, 44 The Broadway, Bracknell, Berks.

In my time as an adventurer I've been many things — brave warrior, magical elf, even Denis Thatcher, but to start life as a toad...

Of course I never wanted to be a toad, but that's what comes of messing with Witch Hazel. So I strive to cast spells which



will cause a series of metamorphoses until I am free of the body of Kermit's second cousin.

Now I'm a cat — not purrfect but I'm feline better. This form opens up more possibilities, too. However, I can't get through those small holes that I

could a minute ago. I should have planned ahead.

Planning ahead is an integral part of this graphic adventure, and you'll need to be capable of lateral thinking to the nth degree. It's tricky and witty, frustrating and fun. Responses are fast as you'd expect and there's a good keyboard 'Beep'.

Though the written descriptions are rather thin, each scene has a very satisfying illustration, with your figure placed in position — nice to see I was a handsome toad at least! The usual feeling of N-S-E-W location block construc-

tion isn't too strong either with many of the early stages set in single rooms.

A novel and highly entertaining adventure.

John Minson



playing the most advanced games on the computer and is in fact highly discerning when it comes to quality of programming.

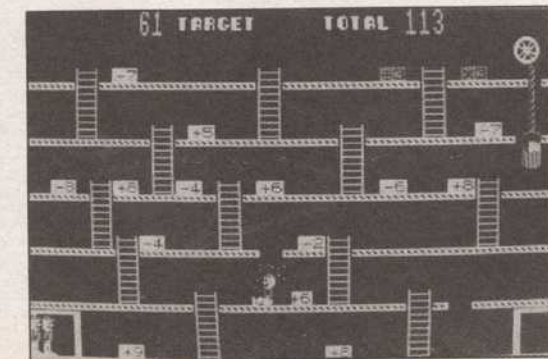
Jerky, slow, dull and uninspired graphics are surely even

Accurate

Program *Number Painter* **Price** £3.95 **Micro** Amstrad CPC 464 **Supplier** ASK London House, 68 Upper Richmond Road, London SW15

The principal reasons for using a micro as an educational medium is that the programs can be tailored to react to the user in proportion to the rate of learning and also that the colourful graphics and attractive sound can be used as an 'attention grabber' and a 'reward' to encourage the child to keep on trying.

Unfortunately a lot of companies seem to fail to realise that your average 12 year old has almost inevitably spent hours



A myth

Program *Orpheus in the Underworld* **Micro** Commodore 64 **Price** £7.95 **Supplier** Sterling Software, Garfield House, 86/88 Edgeware Road, London W2.

The success of Activision's *Pitfall* has given rise to a number of imitators, most obviously Microdeal's *Cuthbert in the Jungle*.

Some of the same ideas have found their way into *Orpheus in the Underworld* from Sterling Software — but this time with a mythological setting.

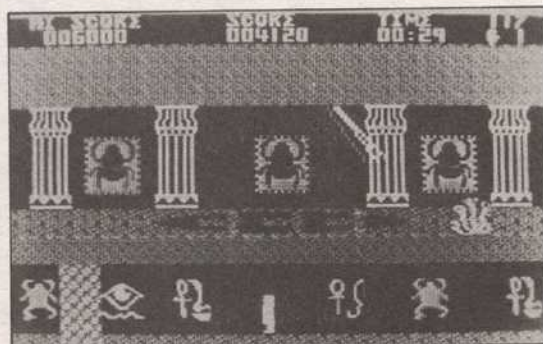
The format of the game is very much as before. The objective is to collect various jewels, treasure chests and the

like which are distributed over 120 screens, while avoiding the hazards. These take the form of rolling boulders, tar pits, deadly multi-headed serpents, etc. Some of the tar pits have the nasty habit of opening up under your feet as you try to run across the screen.

Those of you familiar with the earlier games will recognize all of these features. The similarity continues — there are also some underground passages which contain more treasures and hazards.

If you enjoy the *Pitfall*-style game you will probably like this too — and the graphics are quite interesting. It's hardly very original though.

Richard Corfield



more off-putting than usual when burdened with the label of 'educational software'. Just as well then that ASK's programming and presentation is faultless. Fast and accurate mental arithmetic is tested against an arcade format somewhat similar to the *Panic*

computer game. You have a reasonably tight timespan within which to climb ladders up and down platforms collecting numbers which are used to divide, multiply, subtract and add together to reach a predetermined target number.

The lowest levels are encouragingly easy and should suit most five year-olds whilst the highest levels can be very hard indeed so there is a real progression in ability. To confirm this there is an enclosed self test routine to measure any improvement in your performance.

What makes it a winner also is the fact that the 'gameplay' is slick, challenging and enjoyable enough to make it a medicine that is very easy to swallow.

Tony Kendle



Detailed Tester

Program *Battlecars* Price £7.95 **Micro** Spectrum 48K **Supplier** Games Workshop, 27/29 Sunbeam Road, London NW10 6JP.

This is one of three releases from the peple most usually associated with Fantasy Role Playing Games such as *Dungeons and Dragons*. Indeed, *Battlecars* is directly taken from a series of FRP's of the same name. It is, therefore, no surprise that the amount of thought that has gone into the actual gameplay is tremendous.

The documentation is very slick and reading the booklet gives an indication of the character and atmosphere that makes role playing games so popular.

On loading the game initial impressions are also favourable. The two cars, your's and a friend's, or your's and the computer's, are each given a display window showing their local surroundings from above. There is also a map of the whole playing area showing relative positions; it looks like Ultimate's *Trans Am* with more detailed landscapes. Unfortunately, the similarity ends there. Of the three releases only *Battlecars* desperately needed to be a fast, smooth scrolling game — instead the cars creak along with slow character square movement which ruins everything.

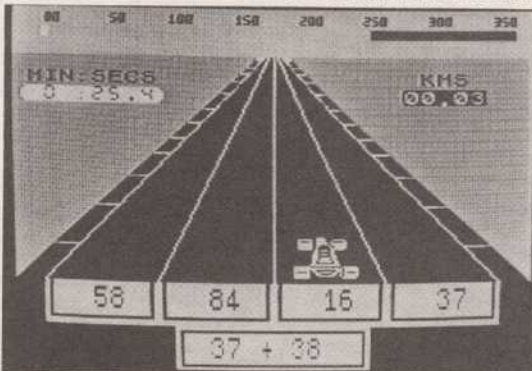
You are given good value with over 90K of code split into sections such as a car designer module and three game settings. The first is a complex race circuit where you can challenge the clock, a friend or the computer. The second screen is an open combat arena, but the computer plays its part here too. The game really comes into its own as a two-player game and the last module, 'the city', is by far the most exciting.

Unfortunately, unless it is recorded, which would make it brilliant, the game will only appeal to the limited two-player market.

Tony Kendle



Program *Estimator Racer* Price £4.95 **Micro** Spectrum 16K **Supplier** Sinclair Research, Stanhope Road, Camberley, Surrey GU15 3PS



I've always been sceptical about 'educational arcade' programs. Often they're just a little maths tacked onto an

outdated shooting game. But Psion's reputation is outstanding, and with Applied Systems knowledge they've produced this mental arithmetic tester.

Estimator Racer is a simple Pole Position with sums. Steer your car across the four num-

bered lanes of the track choosing the one with the figure closest to the answer to the question below. Every half ki-

To scale

Program *Geography — environmental studies* **Micro** Spectrum Price £8.95 **Supplier** SciSoft, 5 Minister Gardens, Newthorpe, Eastwood, Nottingham.

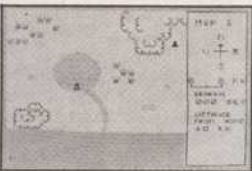
Too often the word 'educational' has been used as a way of conning the public or schools into buying software of little interest and even less educational value.

Not so with this package which combines four separate programs each containing a number of different activities.

The set of programs is ac-

companied with a booklet describing the programs and a suggested method of use is included for any poor teachers too exhausted to work out their own.

Quality has not been sacrificed for quantity — the 'modules' are interesting and include a simulation using the spread of disease amongst trees as the model, a data base



Random

Program *QL Forth* Price £29.95 **Micro** (Version AH and above) **Supplier** Computer One, Science Park, Milton Road, Cambridge.

The first and most important fact about this version of the Forth language is that it is a full implementation of the Forth 83 standard and not the old Fig 79 standard version found on most computers.

This means that there are a great number of improvements

as well as the additions to make use of the QL's power and hardware.

Even with the limitations of the microdrives, this version allows random access files as well as sequential files to be used. You may also multi-task up to ten other Forth programs while running one main program. To go with the Forth there are two software overlays — the first is a powerful editor and the second is a Forth dictionary. These are overlays as the system works within 64K of which 20K is

lometre you either continue if correct or stall, losing valuable time, if not.

To complicate things, the second section adds oil slicks which cause skids and jumble the lane numbers. Rocks then cause further stalls, while the right rally finale makes you cross all the lanes to illuminate their values.

I found this all genuinely exciting. Trying to calculate without having to decelerate while avoiding additional hazards keeps you thinking under pressure. In fact, recognising an approximate answer is often more valuable than producing a slower, more precise solution.

The program has four skill levels (faster care, more difficult questions), a choice of sums, plus practice and demo modes. I can't praise it too highly and there are many adults who would enjoy and benefit from it. **John Minson**



program containing information about all the major countries of the world and two games. Both of these set clear objectives and utilise skills of map reading, using scale, making decisions, etc, in the search for fun (and learning).

All the programs are based on good ideas, fast efficient programming, lively colourful presentation and achieve sensible educational goals.

On the cover it says "approved by teachers". It should have said "approved by kids" as well.

Chris Stoneham



taken up by the Forth itself, so leaving 44K for programs. This memory limitation is no real problem as few people write programs over 44K in length.

The manual supplied is most useful and gives all the information on the additions that have been made to the version Forth. Of the 70 pages, 40 cover the 'word' set while the rest deals with using the editor and assembler.

Roger Thomas



Overtime

Program Payroll Plus 64 Price £97.75 **Micro** Commodore 64 with disc drive **Supplier** Landsoft

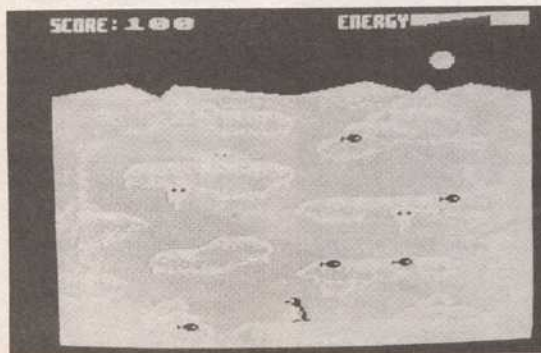
Landsoft, a company primarily concerned with specialised business packages, has produced a payroll package for the Commodore 64. In common with all pre-programmed payroll packages it conforms with the Inland Revenue requirements for computerised payroll records.

While most software support for the C64 has been fairly and squarely in the games arena, a number of companies do produce business material for the 64 and it is a simple task to build a full accounting system. Operating a business on a 64 system — ie, micro, disc drive and printer — requires a considerable amount of manual dexterity. To accommodate all the necessary functions a library of pre-programmed and file discs must be manipulated. A double disc drive eases matters but does not eradicate the problem.

Once the difficulties of tending to the disc library had been overcome and the payroll package loaded, the program proved to be neat and reliable.

Ice-flow

Program The Perils of Percival Penguin Price £6.95-£8.00 **Micro** BBC B **Supplier** Willowsoft, The Willows, Wrington Lane, Congresbury, Bristol.



Payroll 64 is menu-driven and passworded to ensure security. The first stage is to input basic employee information. This is drawn from normal P45 information plus departmental status, etc, not unlike the employee record cards in a manual system.

The employee files allow for pre-set adjustments — two pre-tax and two after tax. At any point of payment a further three pre and after tax adjustments are made available. Three overtime rates can be shown and pre-set. It is highly unlikely, however, that in a small operation these facilities would be fully utilised.

The employee may be shown as hourly, weekly or monthly — in the first two cases the rate must be input per week or hour. In the last case the annual salary is sufficient and the program will make the splits for you at the point of payment.

As each payment period ends, information on overtime worked and any adjustments are easily added, the program automatically updates the files and a payslip can be produced. The payslips are printed in duplicate side by side, so perforated paper is a must. Payslip print outs can be obtained after each employee entry, by selection, or as a continuous run. Up to 100 employees can be administered.

After each entry sequence

No, this is NOT Pengol! You are a daddy penguin who having sat on the eggs for ages now tries to cross the Antarctic ice to the sea. You face hazards like ice-slides, attacking gulls, zooming seals and deep crevasses filled with weird monsters mu-

(weekly/monthly) an analysis of pay, national insurance, tax etc, is available. It is easily understood and provides a suitable basis for nominal postings. Information for the purposes of completing form P35 is readily accessible and the end of tax year routine is a simple operation.

The program does not cater for statutory sick pay rules which could prove problematic, though, to be fair, programs covering this subject are cumbersome and difficult to manage.

On the whole, I found the program simple and accurate, but I cannot help wondering where its intended user base is. Small businesses running solely a Commodore 64 cannot be thick on the ground.

One can imagine a new company using a C64 already in one executive's possession, or the case of a business wishing to hold its payroll information totally separate to its main accounting function. In this case, it seems a reasonable buy.

At £97.95, the price is a little on the high side. A facility is also given for an update service at £23 per annum — a necessary addition to cope with the vagaries of the Inland Revenue.

Robert Weir



tated by radiation.

To maintain energy you must eat the fish dropped by your mate on her way back from the sea to relieve you. You'll need that energy! Each screen must be completed within a day or lose a life.

The graphics are good and the action quite smooth. There is a musical accompaniment which you can turn up or down from the keyboard. Michael Legg is credited with the game and he's done a fine job. The cassette liner includes plenty of helpful hints on how to tackle each stage of the game.

There are similarities to the *Manic Miner* school of games but this is more ecologically sound!

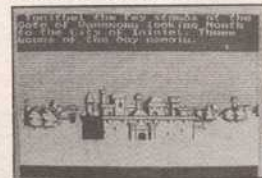
Dave Watterson



Thermal

Program Doomdark's Revenge Price £9.95 **Micro** Spectrum 48K **Supplier** Beyond, Competition House, Farnden Road, Market Harborough, Leicester

In *Lords of Midnight Beyond* hit upon a highly inventive approach to strategy games. Using a technique they called 'landscaping' and a vast number of single key press commands they let the player view the landscape through the eyes of various allied characters as they massed armies and recruited new warriors.



Fans of the *Lords*, and there are many, will already have packed their thermal vests to venture north to rescue Morkin, son of Luxor, who is held by Shareth the Heartstealer. Actually this is the least of the quests, for Tarithel, Morkin's lover, also rides north, and is in need of help herself, and if Shareth can only be beaten then peace may finally reign.

This has added complexity, but thankfully the clarity of the instructions and a handy overlay keep things in hand. The quest is saved from being a mere exercise in button pushing by the accompanying history that leads up to the events, and gives them an epic feel. When I sadly lost Tarithel I actually mourned her heroic passing.

Every byte of the Spectrum has been used, resulting in the absence of a reset routine to return to the start. This unfortunate omission is rectified by Saving the game early, so you can reload if all else fails.

In the time available, this review cannot begin to do *Doomdark's Revenge* justice. All I can say is that I'm hooked and can't wait to return to it.

John Minson



The Chart
Topping
Flight Simulation
Now On
CBM 64.

FREE COLOUR
POSTER AVAILABLE
WITH DISK VERSION

FIGHTER PILOT

ALSO
AVAILABLE ON
THE 48K SPECTRUM

BY D.K. MARSHALL
ADAPTED BY DARRELL D.

COMMODORE 64

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

*The SUPREME SIMULATION
it leaves the rest of the runway 'threshold'!*

SPECTRUM VERSION VOTED
"Simulation of the year - 1984"
by CRASH MICRO READERS.

COMMODORE 64.

Fighter Pilot Disk £14.95
Fighter Pilot Cassette £9.95

LOADING TIMES
DISK - 147 SECS
CASSETTE - 300 SECS

SPECTRUM

Night Gunner 48K £6.95
Fighter Pilot 48K £7.95
Tomahawk 48K Coming
TT Racer 48K Soon

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

Cheques payable to Digital Integration Ltd

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

Name _____

Address _____

Or debit my Access Account No.



Tele Sales
(0276) 684959

Please send to Digital Integration, Dept PCW3
Watchmoor Trade Centre, Watchmoor Road, Camberley, Surrey GU15 3AJ.

DIGITAL
INTEGRATION



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

Trade and Export enquiries
welcome. Lifetime Guarantee.

Bytes get munched

The mystery of the missing Ram passed to QL users
by David Nowotnik

In the section marked *Qdos* in the concepts part of the QL manual you'll find a memory map of the QL, and the main system variables which define where in Ram various items are stored. The addresses of these variables (in the JM version, at least) are those shown below:

SV_Heap	163844
SV_Free	163852
SV_Basic	163856
SV_Trnsp	163860
Sv_Respr	163868
SV_Ramt	163872

These variables take up four bytes each, that is, to obtain their value, you have to Peek L; ie, *Print Peek L (163856)* will give you the start address of the Basic storage area in Ram. Taking the difference between values of variables will give you the amount of space taken up by different systems within Ram.

For example (1) *Peek L (163860) — Peek L (163856)* gives you the amount of space taken up by the Basic program (excluding procedures and functions, which are stored in the procedures area). (2) *Peek L (163856) — Peek L (163852)* provides the amount of unallocated Ram.

By playing around with these systems variables, you can start to find out how a lot of space is wasted in Ram, and some bugs that exist in QL's final Rom, the JM version.

When you first power-up the QL (or press reset), and print the result of expression 1 (the size of Basic), you get 4096 bytes — yet no program exists in this area! I loaded a program which I calculated to be about 14K bytes long (it occupied 33 sectors on a microdrive cartridge; assuming 95K per cartridge and 221 sectors, this makes 33 sectors = 14K). Printing expression 1 (as a direct command) after loading gives 26624 bytes; almost twice the space is allocated to this program than should be required.

Try renumbering a program, and you'll find even more space is gobbled up than originally used by the program.

Here's another quirk; try program one. Run the program immediately after loading or typing into your QL. *x* is given the value of the SV_Basic system variable, the start of Basic, and is printed on the screen on each circuit of the loop. I found that after every 12 circuits of the Repeat loop the value of *x* dropped by 512 bytes; that is, for some unknown reason, more space was being allocated to Basic. Eventually, I got an out of memory error message — for a nine line Basic program! Not only that, but the computer failed to respond to any direct command (even *New*), and I had to press *Reset* (awfully useful that button!) to regain

control.

Even stranger was the fact that if I stopped the program by pressing space, then re-Run the program, the variable *x* changed only occasionally in value.

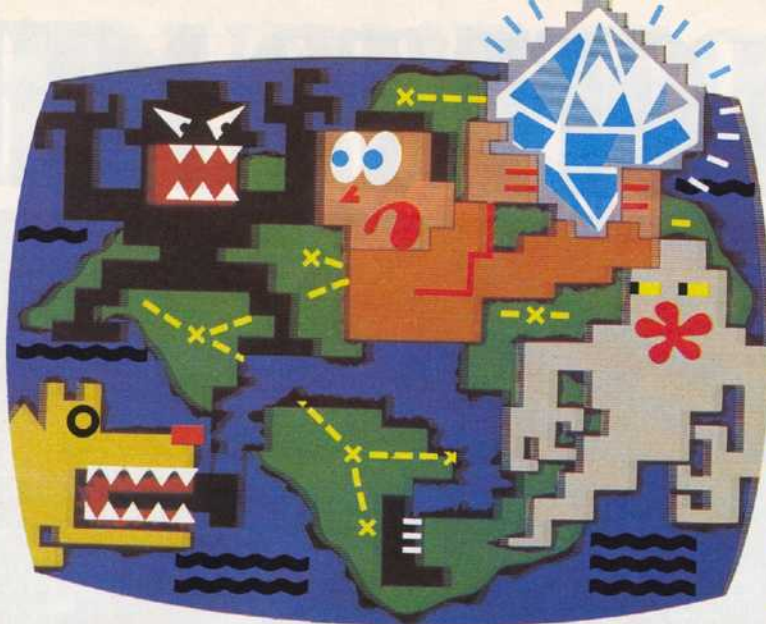
The program I gave here is not just a curiosity; a friend recently used his QL at a swimming meeting to provide an instant results service. To everyone's annoyance,

the program crashed out with an 'out of memory' message, and the results service become far from instant. We found the fault to be when opening a channel to *Ser1* (the printer). Every so often, *Open* (or use of the channel) caused *SV_Basic* to drop, so eventually he ran out of memory.

90K plus of user Ram on the QL may sound vast compared with most other home micros. But, the QL seems to waste a great deal of that space, and lose a lot through very serious errors in Rom. The JM version of Rom has been described as the final version—I hope not, for it seems the QL will be useless with many long Basic programs if they are destined to crash out from the bugs in Rom.

Program one

```
5 t=3
10 REPEAT loop
20 x=PEEK_L(163856)
30 OPEN ft,ser1
40 PRINT x
50 CLOSE ft
60 t=t+1
65 IF INKEY$(0)=" "
THEN EXIT loop
70 END REP loop
```



a diamond can also claim his or her share of the Royalty Fund. **■** This grows with every copy sold up to a maximum of £1 million.

■ The Spirit of the Stones book is a great read.

■ The Spirit of the Stones software is great entertainment.

■ But they're much more than that.

■ They're an adventure.

■ A fascinating tale of mystery and imagination.

■ A voyage of discovery on the Isle of Wight.

■ A voyage of discovery

STONES HIDDEN ON THE ISLE OF WIGHT.

■ There are 41 of them.

■ 41 real diamonds hidden somewhere on the island, just waiting to be discovered.

■ 40 diamonds set in stoneware talismans. And the great Wight Eye itself, the most fabulous diamond of them all.

■ Only **Commodore** one man **COMPUTER SOFTWARE** knows where they are hidden, and he's not saying.

■ All that he has to say he's said already. In the Spirit of the Stones.

■ It's a book and a computer game.

■ And together they reveal the whereabouts of all those diamonds.

■ But — and here's the catch...in the form of riddles and clues.

■ Solve the puzzles in the program and you'll find it easier to solve the puzzles in the book.

■ Solve the puzzles in the book and one (or more) diamonds can be yours.

■ Forever. And ever.

■ You don't even have to go to the Isle of Wight. (Though should you want to, we've put a bargain holiday offer in every pack).

■ You simply work out where the diamonds are, and post off your claim.

■ Whoever discovers

into an unknown world of poltergeists, unholy spirits, banshees, manticores and demons.

■ The Spirit of the Stones is as entertaining as it can be rewarding. And, like all of our software, it has been specifically designed to get the best out of Commodore hardware.

■ You can't choose better.

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

■ SPIRIT OF THE STONES DISK OR CASSETTE WITH BOOK £14.99.



HATS OFF TO MEL



Please send me your free catalogue.
Please send me:

MSX BOOKS

- MSX Games Book £6.95
 The Complete MSX Programmers Guide £14.95
 MSX Exposed £7.95

COMMODORE 64 BOOKS

- Supercharge Your Commodore 64 £5.95
 Commodore 64 Games Book 2 £6.95

- Commodore 64 Software Projects £6.95
 Commodore 64 Games Book £5.95
 Commodore 64 Sound & Graphics £5.95
 Commodore 64 Exposed £6.95
 Commodore 64 Machine Language for the Absolute Beginner £6.95

BBC BOOKS

- Guide to BBC ROMs £9.95
 Building Blocks for BBC Games £6.95
 BBC Software Projects £6.95
 BBC BASIC for Beginners £7.95
 BBC Hardware Projects £8.95

QL BOOKS

- Quick QL Machine Language £7.95

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

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

Trade enquiries welcome.

£
 £ +p/p 80
 Total
 £

All prices include VAT where applicable.
Please include 80p for post and pack.

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

I enclose my cheque/money order for £.

Please debit my Access Card No.

Expiry Date

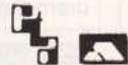
Signature

Name

Address

Postcode

POP2/12



BOURNE HOUSE!



MSX Games Book. Easy-to-enter program listings turn your MSX computer into an arcade of electronic fun and thrills. Games to test your reflexes, nerve, logic, strategy and intelligence! This book will open the door for all MSX owners to a fascinating new dimension of computer game action and excitement.

The Complete MSX Programmers Guide is invaluable for all MSX users from novice to advanced. It's four sections are: a comprehensive self-paced guide for the beginner; a section devoted to advanced programming techniques; a detailed explanation of both BASIC and machine language, and a complete guide to the MSX Operating System.

The Complete MSX Programmers Guide is the reference book that will answer all your questions.

Supercharge Your Commodore 64 gives your Commodore the power of machine language. Without any additional effort, you can overcome the limitations of BASIC. Not only will your programs look better, run faster, and have more spectacular graphics and sound, but you will also be able to develop them in a fraction of the time. Whether you are a beginner or an experienced programmer, Supercharge Your Commodore 64 is a book you cannot be without.

Guide to BBC ROMs. At last a reference book providing 'at-a-glance' pictures of the fundamental concepts of the BBC ROMs. It lists the entry address of each ROM routine, and summarises each aspect of its function.

Guide to BBC ROMs gives you an overall view of your BBC microcomputer, showing you where to find everything you need.

It is readily applicable to all other versions of the BBC microcomputer and its ROMs – a valuable aid to all owners of BBC microcomputers.

Quick QL Machine Language explains how the 68000 instruction set and addressing modes work, and provides you with a full listing of an assembler and disassembler. In this process, the relevant features of SuperBASIC and QDOS are highlighted. This information, coupled with a line explanation of the disassembler, arms you with all the knowledge you need to produce your own assembly language programs.

Light Fantastic

This week a sneak preview of Llamasoft's latest program —
Psychodelia — written and conceived by **Jeff Minter**

Jeff Minter's new program *Psychodelia* is going to come as something of a surprise to those expecting another fast-blast action game. In an industry that uses phrases such as 'innovative', 'unique', and 'totally original', with the abandon usually reserved for confetti at weddings, he has produced something that actually is a little different.

Jeff calls it a Light Synthesiser, and that is a fair enough description. If you've ever been to a laser light show you may find it easier to visualise if you imagine yourself at the controls of one of those machines. Listen

to your favourite track on your stereo while you create a kaleidoscope of swirling and changing colours on your TV. This roughly speaking is what *Psychodelia* is all about.

The concept is quite simple. You control an on-screen cursor with a joystick. On pressing *Fire*, a particular shape is plotted, 'decaying' eventually back to black, through different colours with time. If the joystick is moved while the fire button is held down, the shape is continually replotted, leaving a trail of changing colour.

It is difficult to do the program justice in words, so this week we present a short

version of Jeff's original idea that sparked the whole thing off.

We emphasise, this is just a taster of the main program. *Psychodelia* itself is considerably more complex with many pre-set shapes. It allows you to create your own. You can change the colour decay sequence of the 'trail', as well as its band width and pulse length. Stored sequences can be recalled on-screen and used as a background for more real-time creations.

However, the full-blown *Psychodelia* program will not be available (versions for the C64, C16 and Vic 20) from Llamasoft until December, price £7.50 for the 64, £6.00 for the others.

Until then, type in the Basic listing (paying special note to Lines 30 and 40 before you start), plug in the joystick, turn up your hi-fi and play that TV ...

```

10 REM *** A JEFF MINTER PRODUCTION ***
20 REM *** BASIC PROG. BY KEVIN BERGIN ***
30 REM *** ENTER THE FOLLOWING IN DIRECT MODE BEFORE YOU START!! ***
40 REM *** POKE 43,1:POKE 44,64:POKE 16384,0:CLR:NEW ***
50 PRINT"  HANG ON A SEC....."
60 POKE53281,0:POKE53280,0:FORA=2049TO3457
70 READX:J=J+X:POKEA,X
80 NEXT:IFJ<>98035THEN180
90 PRINT"  WONDERFUL COLOURS COMING..."
100 PRINT"  BUT FIRST HAVE YOU SAVED THIS ?"
110 GETA$:IFA$<>"Y"ANDAN$<>"N"THEN110
120 IFA$="N"THENPRINT"  SAVE IT NOW THEN":STOP
130 PRINT"  TO SAVE THE CODE":PRINT"  PRESS RUN/STOP & RESTORE"
140 PRINT"  THEN SAVE AS NORMAL (THAT IS AFTER YOU EXECIT THIS PROG
150 POKE198,0:PRINT"  PRESS A KEY TO START.":WAIT198,1
160 PRINT"  CLR:NEW":PRINT"  P43,1:P44,8":PRINT"  RUN":CHR$(19)
170 POKE631,13:POKE632,13:POKE633,13:POKE198,3:END
180 PRINT"  DATA ERROR TRY AGAIN!!":STOP
190 DATA11,8,10,0,158,50,48
200 DATA54,52,0,0,0,0
210 DATA0,169,64,133,252,169,8
220 DATA133,254,169,0,133,251,169
230 DATA53,133,253,160,0,162,6
240 DATA177,253,145,251,136,208,249
250 DATA230,252,230,254,202,208,242
260 DATA76,0,64,169,0,141,32
270 DATA208,141,33,208,169,216,133
280 DATA252,169,0,133,251,162,0
290 DATA165,252,157,96,3,165,251
300 DATA157,64,3,24,105,40,133
310 DATA251,165,252,105,0,133,252
320 DATA232,224,25,208,230,32,40
330 DATA69,76,238,66,162,0,169
340 DATA207,157,0,4,157,0,5
350 DATA157,0,6,157,0,7,169
360 DATA0,157,0,216,157,0,217
370 DATA157,0,218,157,0,219,202
380 DATA208,225,96,0,6,2,4
390 DATA5,3,7,1,166,3,189

```

```

400 DATA64,3,133,5,189,96,3
410 DATA133,6,164,2,96,165,2
420 DATA41,128,208,249,165,2,201
430 DATA40,16,243,165,3,41,128
440 DATA208,237,165,3,201,24,16
450 DATA231,32,92,64,177,5,41
460 DATA7,162,0,221,84,64,240
470 DATA5,232,224,8,208,246,138
480 DATA133,253,166,4,232,228,253
490 DATA240,3,16,1,96,166,4
500 DATA189,84,64,145,5,96,32
510 DATAB6,65,160,0,165,4,201
520 DATA7,208,1,96,169,7,141
530 DATA76,65,165,2,133,8,165
540 DATA3,133,9,165,8,24,121
550 DATA254,64,133,2,165,9,24
560 DATA121,37,65,133,3,152,72
570 DATA32,86,65,104,168,200,185
580 DATA254,64,201,85,208,225,206
590 DATA76,65,173,76,65,197,4
600 DATA240,8,201,1,240,4,200
610 DATA76,196,64,165,8,133,2
620 DATA165,9,133,3,96,0,1
630 DATA1,1,0,255,255,255,85
640 DATA0,2,0,254,85,0,3
650 DATA0,253,85,0,4,0,252
660 DATAB5,255,1,5,5,1,255
670 DATA251,251,85,0,7,0,249
680 DATAB5,85,255,255,0,1,1
690 DATA1,0,255,85,254,0,2
700 DATA0,85,253,0,3,0,85
710 DATA252,0,4,0,85,251,251
720 DATA255,1,5,5,1,255,85
730 DATA249,0,7,0,85,85,1
740 DATA189,153,225,238,78,65,96
750 DATA0,0,165,2,72,165,3
760 DATA72,32,107,64,173,149,65
770 DATA208,8,104,133,3,104,133
780 DATA2,96,96,169,40,56,229
790 DATA2,133,2,32,107,64,173
800 DATA149,65,201,1,240,231,169
810 DATA24,56,229,3,133,3,32
820 DATA107,64,104,168,104,133,2
830 DATA152,72,32,107,64,104,133
840 DATA3,96,1,15,14,13,12
850 DATA11,10,9,4,5,6,7
860 DATAB8,9,10,11,12,13,14
870 DATA15,16,17,18,19,20,21
880 DATA22,23,20,19,18,17,16
890 DATA0,0,0,0,0,0,0
900 DATA0,0,0,0,0,0,0

```


BLACK THUNDER

*Coming to your
screen soon!*

COMMODORE 64

Cassette £7.95 Disk £12.95



Available exclusively from

QUICKSILVA

in association with The Wizard Development Company Ltd. DJR

Quicksilva Mail Order, P.O. Box 6, Wimborne, Dorset BA21 7PY.

Telephone (0202) 891744.



Selected titles available at:

WHSMITH



WOOLWORTH

John Menzies

and leading multiple retailers and specialist computer stores.

Commodore 64

910 DATA0,0,0,0,0,0,0
920 DATA0,0,0,0,0,0,0
930 DATA0,0,0,0,12,13,14
940 DATA15,15,15,14,4,4,4
950 DATA4,4,4,4,4,5,6
960 DATA7,8,9,10,11,12,13
970 DATA13,13,13,7,8,9,10
980 DATA11,0,0,0,0,0,0
990 DATA0,0,0,0,0,0,0
1000 DATA0,0,0,0,0,0,0
1010 DATA0,0,0,0,0,0,0
1020 DATA0,0,0,0,0,255,255
1030 DATA255,255,255,255,255,255,255
1040 DATA255,255,255,255,255,255,255
1050 DATA255,255,255,255,255,255,255
1060 DATA255,255,255,255,255,255,255
1070 DATA255,255,0,0,0,0,0
1080 DATA0,0,0,0,0,0,0
1090 DATA0,0,0,0,0,0,0
1100 DATA0,0,0,0,0,0,0
1110 DATA0,0,0,0,0,0,12
1120 DATA12,12,12,12,12,12,12
1130 DATA12,12,12,12,12,12,12
1140 DATA12,12,12,12,12,12,12
1150 DATA12,12,12,12,12,12,12
1160 DATA12,12,12,0,0,0,0
1170 DATA0,0,0,0,0,0,0
1180 DATA0,0,0,0,0,0,0
1190 DATA0,0,0,0,0,0,0
1200 DATA0,0,0,0,0,0,0
1210 DATA4,7,1,2,3,6,7
1220 DATA6,12,2,3,6,7,1
1230 DATA2,2,4,4,7,1,2
1240 DATA3,6,7,12,2,3,2
1250 DATA3,7,1,2,0,0,0
1260 DATA0,0,0,0,0,0,0
1270 DATA0,0,0,0,0,0,0
1280 DATA0,0,0,0,0,0,0
1290 DATA0,0,0,0,0,0,0
1300 DATA0,162,0,138,157,150,65
1310 DATA157,214,65,157,22,66,157
1320 DATA86,66,157,150,66,232,224
1330 DATA64,208,236,96,32,214,66
1340 DATA32,44,67,238,43,67,173
1350 DATA43,67,45,53,68,141,43
1360 DATA67,170,222,150,66,208,34
1370 DATA189,86,66,157,150,66,189
1380 DATA22,66,201,255,240,21,133
1390 DATA4,189,150,65,133,2,189
1400 DATA214,65,133,3,32,171,64
1410 DATA174,43,67,222,22,66,76
1420 DATA244,66,8,120,169,75,141
1430 DATA20,3,169,67,141,21,3
1440 DATA169,10,141,50,68,141,51
1450 DATA68,169,1,141,21,208,141
1460 DATA39,208,88,96,1,0,206
1470 DATA73,67,240,3,76,49,234
1480 DATA169,2,141,73,67,169,0
1490 DATA133,12,32,42,68,173,0
1500 DATA220,41,3,201,3,240,37
1510 DATA201,2,240,6,238,51,68
1520 DATA238,51,68,206,51,68,173
1530 DATA51,68,201,255,208,8,169
1540 DATA23,141,51,68,76,141,67
1550 DATA201,24,208,5,169,0,141
1560 DATA51,68,173,0,220,41,12
1570 DATA201,12,240,37,201,8,240
1580 DATA6,238,50,68,238,50,68
1590 DATA206,50,68,173,50,68,201
1600 DATA255,208,8,169,39,141,50
1610 DATA68,76,187,67,201,40,208
1620 DATA5,169,0,141,50,68,173
1630 DATA0,220,41,16,240,8,169
1640 DATA0,141,54,68,76,5,68
1650 DATA173,55,68,240,8,173,54
1660 DATA68,208,49,238,54,68,238
1670 DATA52,68,173,52,68,45,53
1680 DATA68,141,52,68,170,189,22
1690 DATA66,201,255,208,26,173,50
1700 DATA68,157,150,65,173,51,68
1710 DATA157,214,65,169,7,157,22
1720 DATA66,173,56,68,157,86,66
1730 DATA157,150,66,32,25,68,177
1740 DATA10,41,7,141,74,67,169
1750 DATA1,133,12,32,42,68,76
1760 DATA49,234,174,51,68,189,64
1770 DATA3,133,10,189,96,3,133
1780 DATA11,172,50,68,96,32,25
1790 DATA68,165,12,145,10,96,30
1800 DATA13,26,31,0,0,12,0
1810 DATA0,0,0,0,0,0,91
1820 DATA0,0,0,0,0,0,0
1830 DATA0,0,0,0,0,0,0
1840 DATA0,0,0,0,0,0,0
1850 DATA0,0,0,0,0,0,0
1860 DATA0,0,0,0,0,0,0
1870 DATA0,0,0,0,255,0,0
1880 DATA0,0,0,0,0,0,0
1890 DATA0,0,0,0,0,0,0
1900 DATA0,0,0,0,0,0,0
1910 DATA0,0,0,0,0,0,0
1920 DATA0,0,0,0,0,0,0
1930 DATA0,0,0,0,0,0,0
1940 DATA0,0,0,0,0,0,0
1950 DATA0,0,0,0,0,0,0
1960 DATA0,0,0,0,0,0,0
1970 DATA0,0,0,0,0,0,0
1980 DATA0,0,0,0,0,0,0
1990 DATA0,0,0,0,0,0,0
2000 DATA0,0,0,0,0,0,0
2010 DATA0,0,0,0,0,0,0
2020 DATA0,0,0,0,0,0,0
2030 DATA0,0,0,0,0,0,0
2040 DATA0,0,0,0,0,0,0
2050 DATA0,0,0,0,0,0,0 2060 DATA0,0,0,0,0,0,0
2070 DATA0,0,0,0,0,0,0 2080 DATA0,0,0,0,0,0,0
2090 DATA0,0,16,19,25,3,8 2100 DATA5,4,5,12,
2110 DATA46,46,1,32,6,15,18
2120 DATA5,20,1,19,20,5,32
2130 DATA2,25,32,10,5,6,6
2140 DATA32,13,9,14,20,5,18
2150 DATA32,50,64,162,40,189,255
2160 DATA68,157,191,7,169,12,157
2170 DATA191,219,202,208,242,96,0
2180 DATA0,0,191,0,157,0,255
2190 DATA0,255,0,255,0,255,0
2200 DATA223,255,255,255,255,0,255

VicOdden's of London Bridge

Open
8.30-6pm
Mon to Fri
& 9.00-1pm
Sat
Closed on Satur-
days preceding Bank
Holidays

**MICRO COMPUTER
CENTRE**

6, London
Bridge Walk
London SE1

Tel:
01-403 1988

Prices correct at time of going to press E&OE
All offers subject to availability

Commodore 64 Package



Including:

- Commodore 64
- Quickshot II Joystick
- 1530 Cassette Recorder
- 4 Software Tapes

VIC's Price
Only

£245⁰⁰

BBC Model B Package Offer



HURRY!
Offer extended
**WHILE
STOCKS
LAST!**

Including FREE!
8 Pieces of Software
when you purchase a BBC 'B'

VIC's Price Only

£389⁰⁰

The BBC Model B is probably the most flexible personal computer available today. Using powerful BBC BASIC, the BBC B is widely accepted as providing the educational standard for computer learning.

The model B features a variety of interface ports allowing easy connection, not just of ordinary peripherals but also second processors or devices to give access to teletext or prestel services.

Sensational Sinclair Offer



Including
FREE!

- Computer Scrabble
- Computer Chess
- Survival game
- Chequered Flag game
- Horace goes Skiing game
- Make-a-Chip

VIC's Price
Only

£124⁹⁵

Interest Free Credit Up to £1000

Up to £1000 Instant Credit available to callers who hold a current Clearing Bank Bankers Card or Credit Card for identification. Mail Order customers can apply for a Budget Account Card - please send for application form.

We also stock a
wide range of
other software
& add-ons,
please call in
and see!

Part Exchange

We will give you our top offer for your computer/hi-fi/photo-gear and related items in part exchange. We also buy computers and peripherals for cash.

HOW TO FIND US



Access, Visa, Trustcard & Creditcharge orders can be accepted by post or by telephone on 01-403 1988, 01-407 8933, during normal working hours. There is no surcharge on any credit card orders.

ALL MAIL ORDERS TO:
6 London Bridge Walk,
London SE1 2BX

INSTANT CREDIT

UP TO
£1000

Up to £1000 Instant Credit available to callers who hold a current Clearing Bank Bankers Card or Credit Card for identification. Mail Order customers can apply for a Budget Account Card - please send for application form.

VicOdden's MAIL ORDER SERVICE

All mail order & phone enquiries to 6 London Bridge Walk 403 1988

Name

Address

MAIL ORDER **POST FREE!**

Put to the test

It's never too early to start revising for those exams with Biology Quiz for the BBC B by Simon Pithers

This program tests the user to CSE & GCE levels, and contains 22 sample questions, although in a school environment a very much larger number of questions could be built up.

There is enough memory left in Mode 7 for another 160 long questions; alternatively

enough room for 250-300 small to medium sized ones (this refers to questions put in the data form as in the program).

If an even larger catalogue of questions was required, then a disc database could quite easily be added to the program. A disc with 100K would give about 1200

questions. Therefore, a double-sided double density 80 track dual system would give a staggering 19200 large questions, which should satisfy any Biology department! If adding more data, then change Line 170 to the new amount of questions.

This is the way the data is set out:

"Question"
"1st Choice", "2nd Choice", "3rd Choice", "4th Choice"

"Real Answer A, B, C, D", "revision topic"

When the computer suggests revision topics, it puts itself into page mode, so press Shift to scroll the screen upwards.

```

10 REM *****
20 REM * BIOLOGY QUIZ *
30 REM * By Simon ... *
40 REM * (C) 1984 *
50 REM *****
60
70
80 MODE 7
90 VDU 23;820;0;0;0;
100 *KEY 10 G.:MRLIN:M
110 ON ERROR RUN
120 PROCTitle
130 CLS
140 DIM A$(300),A1$(300),A2$(300),A3$(300),A4$(300),A5$(300),A6$(300)
150 DIM C$(300)
160 R$="":C%=0:W%=0:C1%=0
170 FOR X%=1 TO 22
180 READ A$(X),A1$(X),A2$(X),A3$(X),A4$(X),A5$(X),A6$(X)
190 NEXT
200 FOR X%=1 TO QW
210 CLS
220 PRINT TAB(7)+CHR$(141)+CHR$(157)+CHR$(129)+"Biology Questions "+CHR$(156)
230 PRINT TAB(7)+CHR$(141)+CHR$(157)+CHR$(129)+"Biology Questions "+CHR$(156)
240 QZ=RND(22)
250 C1%=0
260 FOR Y%=1 TO 22
270 IF CEX(Y%)=QZ THEN C1%=1
280 NEXT
290 IF C1%=1 THEN 240
300 PRINT:
310 PRINTA$(QZ)
320 PRINT
330 PRINT"Choose A,B,C or D :-"
340 PRINT
350 PRINT"A)+"CHR$(130)+A1$(QZ)
360 PRINT"B)+"CHR$(131)+A2$(QZ)
370 PRINT"C)+"CHR$(134)+A3$(QZ)
380 PRINT"D)+"CHR$(133)+A4$(QZ)
390 PRINT
400 CEX(X%)=QZ
410 INPUT "Enter Your choice:" C#
420 IF LEN(C#)>1 THEN VDU 7,11:BDT0410
430 C=ASC C#
440 IF C>68 OR C<65 SOUND1,-15,10,5:VDU11:BDT0410
450 IF C#=#A$(QZ) THEN PROCcorrect:NEXT ELSE PROCwrong:NEXT
460 CLS
470 VDU14
480 PRINT:
490 PRINTCHR$(133)+"You got ";C%; "Correct and ";W%; "Wrong"
500 IF W%=0 THEN 630
510 PRINTCHR$(130)+"I SUGGEST YOU REVISE :-"
520 PRINTR#
530 VDU15
540 PRINT:
550 PRINT" Would you like a copy on a printer Y/N"
560 A$=GET#
570 IF A$<>"Y" OR A$<>"y" THEN 630
580 VDU 2
590 PRINT "You got ";C%; "Correct and ";W%; " Wrong"
600 PRINT "I SUGGEST YOU REVISE :-"
610 PRINT R#
620 VDU3
630 PRINT
640 PRINT" Do you want another go Y/N"
650 A$=GET#:IF A$="Y" OR A$="y" THEN RUN
660 END
670
680
690
700 DEF PROCTitle
710 PRINT""
720 PRINT TAB(7)+CHR$(141)+CHR$(157)+CHR$(129)+"Biology Questions "+CHR$(156)
730 PRINT TAB(7)+CHR$(141)+CHR$(157)+CHR$(129)+"Biology Questions "+CHR$(156)
740 PRINT
750 PRINT CHR$(131);"Program and data written by S.C.Pithers"
760 PRINT
850 PRINT
860 INPUT "How many question do you want 1-22:"QW
870 IF QW<1 OR QW>22 THEN VDU11:BDT0860
880 ENDPROC
890
900
910 DATA "Osmosis is the process by which living cells take in "
920 DATA "Salt solution","Water","Carbon dioxide","Oxygen"
930 DATA "B","Osmosis"
940
950 DATA "Saliva contains an enzyme which acts upon"
960 DATA "Fat","Starch","Protein","Bile"
970 DATA "B","Digestion and Enzymes"
980
990 DATA "A chemical compound present in the plasawhich helps the blood to clots"
1000 DATA "Adrenalin","Fibrogen","Haemoglobin","Albumen"
1010 DATA "B","Blood"
1020
1030 DATA "When one of the following diseases affects heavy smokers more frequently than non-smokers"
1040 DATA "Influenza","Bronchitis","Malaria","Typhoid"
1050 DATA "B","Respiration"
1060
1070 DATA "Which of the following is not a form of Bacteria"
1080 DATA "Cocci","Bacilli","Alveolus","Vibrio"
1090 DATA "C","Bacteria & Viruses (Protoza)"
1100
1110 DATA "When an adolescent is at rest, his normal breathing rate in breaths per minute is about"
1120 DATA "4","16","48","64"
1130 DATA "C","Heart"
1140
1110 DATA "Coiled sweat glands are found in the skin of mammals. In which layer are they embedded?"

```

continued on page 38

QUARTERBACK



American Football for the 48K Spectrum

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

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

- * microdrive compatible
- * play by mail league with FREE entry

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

DRAGON SOFTWARE



£1-99

SNIP

CECIL PLAYS 21 - LOADING THIS PROGRAM WILL BRING OUT CECIL THE CHIMP AND GAMBING DRAGON... HE LOVES WORKING AND BATES COOKING AND WILL TELL YOU SO... HE'LL LAUGH AT YOU, GROWL AT YOU AND IF YOU TAKE ALL HIS MONEY WATCH OUT!

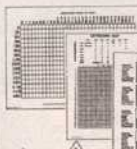
TELEPATH - A FROTHING NEW CONCEPT FROM DRIP... DO YOU HAVE PSYCHIC POWERS? HAVE TELEPATH WILL HELP YOU FIND OUT! THIS VERY SPECIAL PROGRAM INCLUDES A SPOOKY HISTORY OF TELEPATHOLOGY, A GRAPHICS DEMONSTRATION & 66 COLOURS THE E.E.F. TEXT... PLUS MANY MORE NEW AND EXCITING FEATURES!



£1-99

SNIP

CRAPS - AMAZINGLY ADDICTIVE GAME WILL KEEP YOU HOOKED FOR HOURS... ROLL THE DICE AND TRY TO BEAT THE BANK... FREE ROULETTE GAME ON SIDE 2.

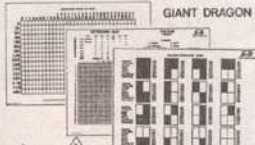


£1-99

SNIP

MURDERS - CAN YOU SURVIVE ON MURDERS ISLAND? TRAVE AT THE VILLAGES? TRANSPORT YOUR OWNERS... KIDS AND FEEL THROUGH PORTERS SET ON KILL WITH THE MICRODRIVE... AVOID THE SAAGERS, EELI, ALLIGATORS, GIBBERE, MURDERERS! ALL THESE AND MANY MORE ADVENTURES AWAIT YOU ON MURDERS ISLAND 2.

GIANT DRAGON PROGRAMMERS CHARTS



£7-50

All Snip Products

Stock Clearance

£1.99

OR
 All FOUR CASSETTES
 For Just £6-50
 OR

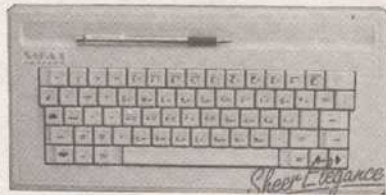
CHARTS & 4 TAPES
 £7-50

FOR FAST DESPATCH
 CHECKS BOX TO SNIP SOFTWARE LTD.
 PO BOX 20 WOKING SURREY GU21 3QN

IF YOU WANT THE BEST THIS CHRISTMAS

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

£177.50



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

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

PLEASE SEND ME

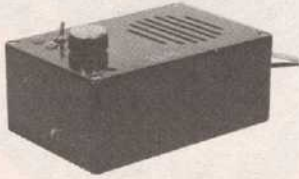
- Spectrum 48K with SAG 1 Emperor keyboard fitted.
- Dust cover
- Extender cable
- Carry case
- Sound booster.

I enclose cheque/P.O. for

ZEAL MARKETING LIMITED
 Vanguard Trading Estate,
 Storfirth Lane,
 Chesterfield S40 2TZ. Tel: 0246 208555

LET OUT THOSE SOUNDS WITH A
 ZEAL SOUND BOOSTER FOR SPECTRUM

£14.50



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

ALL PRICES INCLUDE VAT/CARRIAGE.

```

1120 DATA "Dermis","Muscular layer","dead horny layer",
"Epidermis"
1130 DATA "A","Skin (Sensitivity)"
1140
1150 DATA "A temporary increase in the pulse rate may
be caused by"
1160 DATA "Amylase","Antigens","Amino-acids","Adrenalin"
1170 DATA "D","Hormones"
1180
1190 DATA "In man, the cavity of the middle ear is filled
with"
1200 DATA "lymph","water","air","tissue fluid"
1210 DATA "C","Hearing (Sensitivity)"
1220
1230 DATA "Which one of the following pairs of
substances is supplied to the foetus via the umbilical
cord?"
1240 DATA "carbon dioxide and haemoglobin","Oxygen and
glucose","carbon dioxide
and glucose","Oxygen and urea"
1250 DATA "B","Reproduction"
1260
1270 DATA "Which one of the following is the white
part of the eye?"
1280 DATA "Sclera","choroid","retina","fovea"
1290 DATA "A","Eye (Sensitivity)"
1300
1310 DATA "Which is the energy carrying molecule here"
1320 DATA "ATP - Adenosine triphosphate","DNA -
Deoxyribonucleic Acid","RNA - Ribonucleic Acid","TSH
- Thyroid Stimulating hormone"
1330 DATA "A","Respiration"
1340
1350 DATA "Which is NOT a genetic base in a DNA
1360 DATA "Adenine","Guanine","Iodine","cytosine"
1370 DATA "C","Genetics"
1380
1390 DATA "Which of the following is a sugar"
1400 DATA "sodium","pentose","thymine","insulin"
1410 DATA "B","Nutrition"
1420
1430 DATA "Which of the following is part of a neurone?"
1440 DATA "Dendrite","Carpal","Centromere","spiral"
1450 DATA "A","Nerves and coordination"
1460
1470 DATA "Which of the following is contained in
the palisade layer?"
1480 DATA "Lymphnodes","Chloroplasts","Axons",
"Synovial Fluid"
1490 DATA "B","Plants and Photosynthesis"
1500
1510 DATA "Which of the following is not contained in
the protoplasm of a living cell"
1520 DATA "Cell membrane","Endoplasmic Reticulum R&S",
"Cell wall","Mitochondria"
1530 DATA "C","Cell Structure"
1540
1590 DATA "Which of the following is a Bone"
1600 DATA "Radicle","Hilum","Plumule","Clavicle"
1610 DATA "D","The Skeleton"
1620
1630 DATA "Which of the following is not part of
the reproduction organs of either sex"
1640 DATA "Cervix","Oviduct","Epidermis","Epididymis"
1650 DATA "C","Reproduction"
1660
1670 DATA "Which of the following is a part of an
insects compound eye."
1680 DATA "Rhabdom","Neoplasia","Procambium","Solenostele"
1690 DATA "A","Insects & Sences"
1700
1710 DATA "Which is not organic"
1720 DATA "Cell membrane","Vitamins","Minerals",
"Protoplasm"
1730 DATA "C","Nutrition"
1740
1750 DATA "Which of the following is a tissue"
1760 DATA "Muscle","GSH - gonad stimulating hormone",
"the stomach","the skeleton"
1770 DATA "A","Tissue"
1780
1790 DATA "Man is a mammal because"
1800 DATA "he moves in search of food","he is a
vertebrate","he has hair","he is warm-blooded"
1810 DATA "C","Mammal - amphibians etc"
1820 DATA "Where does meiosis take place"
1830 DATA "In the mouth","In the gonads","In the spleen",
"In the epidermis"
1840 DATA "B","Genetics - Meiosis"
1850
1860 DEF PROCcorrect
1870 CX=CX+1
1880 PRINT
1890 PRINTCHR#141+CHR#157+CHR#129;"CORRECT "+CHR#156
1900 PRINTCHR#141+CHR#157+CHR#129;"CORRECT "+CHR#156
1910 SOUND1,-15,110,5
1920 Q=INKEY 120
1930 ENDFPROC
1940
1950
1960 DEF PROCwrong
1970 WX=WX+1
1980 PRINT
1990 PRINTCHR#141+CHR#157+CHR#129;"WRONG "+CHR#156
2000 PRINTCHR#141+CHR#157+CHR#129;"WRONG "+CHR#156
2010 PRINT
2020 PRINTCHR#141+CHR#157+CHR#130;"The answer is
";AS$(Q);" ";CHR#156
2030 PRINTCHR#141+CHR#157+CHR#130;"The answer is
";AS$(Q);" ";CHR#156
2040 SOUND1,-15,10,5
2050 Q=INKEY 170
2060 RF=RF+CHR#134+A$(Q)+CHR#13+CHR#10
2070 ENDFPROC

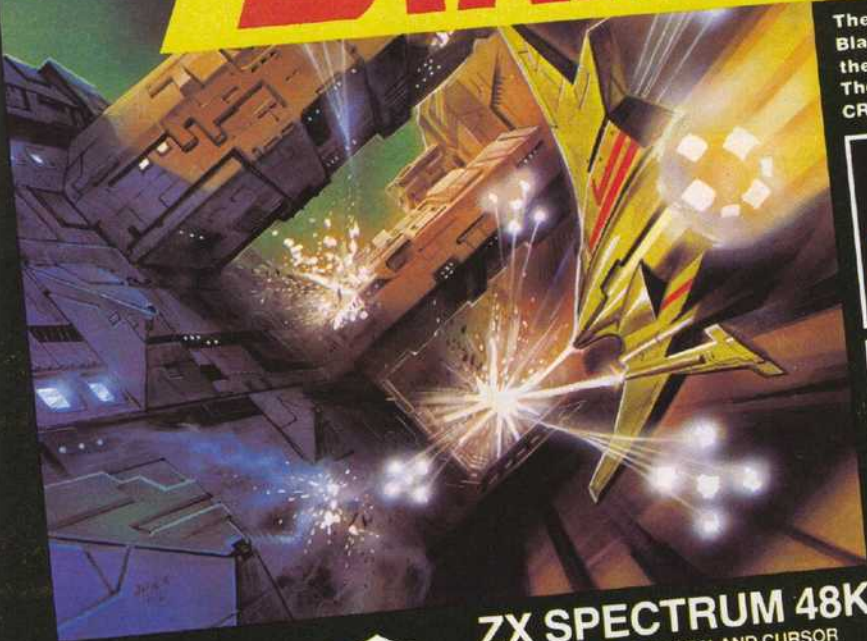
```

3D

£5.95

STARSTRIKE

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



ZX SPECTRUM 48K
 SINCLAIR, KEMPSTON AND CURSOR
 JOYSTICK COMPATIBLE

3-D TANK DUEL

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



£5.50

REALTIME SOFTWARE, PROSPECT HOUSE, 32 SOVEREIGN STREET,
 LEEDS LS1 4BJ

BOTH GAMES FOR ONLY £10

Name _____ Address _____ Postcode _____
 Cheques (p.o. payable) Pa P Incl
 REALTIME SOFTWARE


```

100 PRINT "Checksum Error"
200 DATA 221,229,221,42,11,92,221,94,
6,221,86,7,123,178,40,70,221,110,15,
221,102,16,167,237,82,56,59,68,77,197
,221,94,4,221,86,5,221,110,13,221,102
,14,229,213,197,221,78,6,221,70,7,26,
190,32,19,35,19,11,120,177,32,245,193
,209,225,225,237,66,68,77,221,225,3,
201,193,209,225,120,177,40,4,11,35,24
,213,193,221,225,1,0,0,201

```

Program 2

```

Test Instring Function
10 CLEAR 59999
20 LET mc=60000
30 LOAD "instr"CODE mc
40 DEF FN I(a$,b$)=USR mc
50 PRINT FN I("ok","it is ok")
60 LET a$="it is ok"
70 LET b$="ok"
80 PRINT FN I("ok",a$)
90 PRINT FN I("ok",a$(7 TO ))
100 PRINT FN I(b$,a$)
110 PRINT FN I("",a$)
120 PRINT FN I(a$,b$)

```

**NEXT
TER
BYTES.**

Tim Hartnell's
**COMPUTER
Kwik-Bytes**



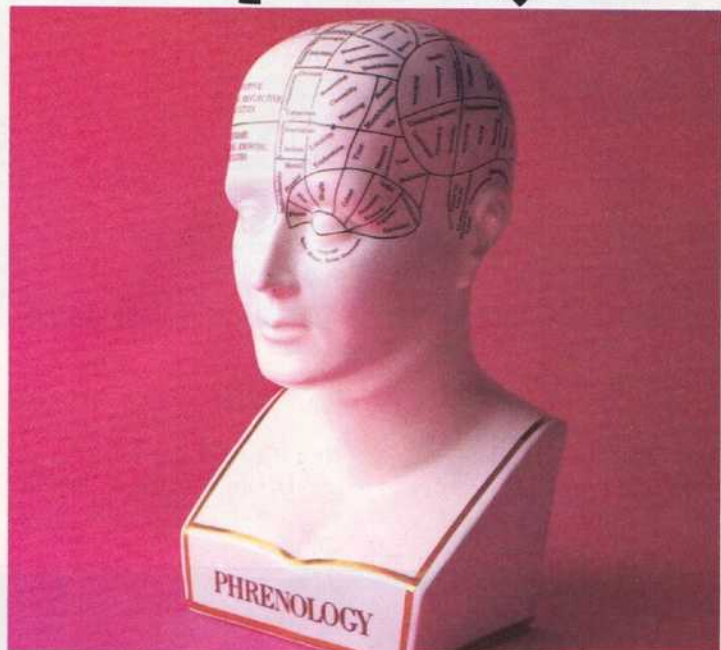
£1.25



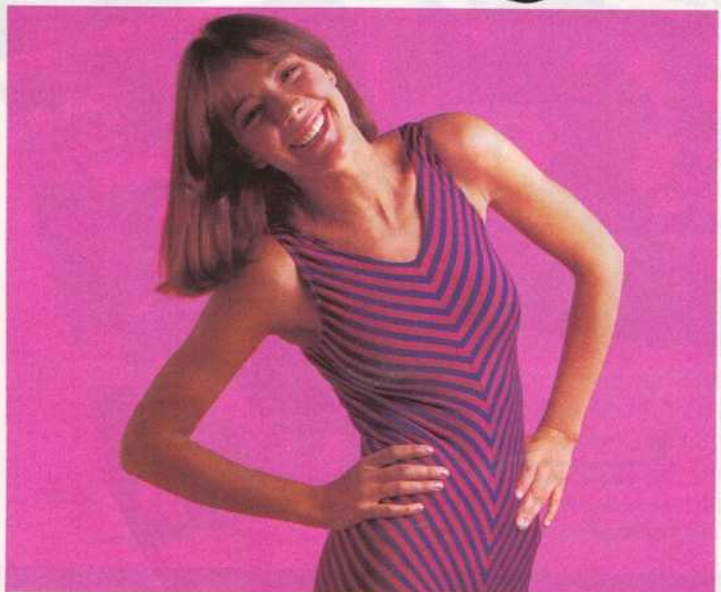
Interface Publications Ltd

Available at W. H. Smith
and all good newsagents.

Do you want to expand your mind



or lose weight?



Home computing isn't all fun and games. The Mirrorsoft Home Discovery series of software programs can help broaden your knowledge and experience or even assist you to lose weight.

KNOW YOUR OWN PSI-Q

How strong are your Psi powers? This intriguing and comprehensive package, by Prof. Hans Eysenck and Carl Sargent is based on their book published by Michael Joseph. It checks for and helps develop latent Psi ability in individuals or groups of individuals – notably clairvoyance, recognition of hidden objects or symbols, and precognition, foretelling future events.

On cassette for the CBM64, Spectrum 48K, BBC B, Electron. **£9.95**

KNOW YOUR OWN PERSONALITY

A fascinating way to get through to the 'real' you. Devised by Prof. Hans Eysenck and Dr. Glenn Wilson from their Pelican book of the same name. You'll get a clearer insight into yourself, and others too.

On cassette for the Spectrum 48K, BBC B, Electron. **£9.95**

STAR SEEKER

Published in association with the London Planetarium. This pair of programs, written by Dr. Paul Phillips FRAS, brings the magic of the heavens into your home.

Star Seeker accurately plots the most prominent stars from any position on Earth; at any time in this or the next century. You can obtain information on individual stars, and draw constellations. Solar System plots Planets and Halley's Comet, with us next year!

On cassette for the BBC B (Spectrum 48K and CBM64 versions coming soon). **£9.95**



MASTERMIND

Adapted from the well known BBC TV quiz game, this program lets you take the chair for general knowledge and special subject questions. It comes with two sets of each. Up to four players. Further low-cost packs of questions coming soon.

On cassette for the Spectrum 48K, BBC B, Electron. **£9.95**

THE JOFFE PLAN

A 'no-diet' personal weight control program. Prof. Joffe's Plan awards credits or penalties based on progress to a target weight agreed between the user and the computer. Food is the best reward for an over-eater. So credits earned allow you to indulge in a favourite dish. Penalties mean less food, more exercise.

On cassette for the CBM64, Spectrum 48K, BBC B, Electron. **£9.95**

Also available: Mastermind QUIZMASTER – Set your own questions to run on the Mastermind program. On cassette for the Spectrum 48K, BBC B, Electron. **£5.95**



MIRRORSOFT
SOFTWARE FOR ALL THE FAMILY

Available from Boots, W. H. Smith, Spectrum and all good software stockists. Write for free catalogue to: Mirrorsoft, Holborn Circus, London, EC1P 1DQ.

POWER-GRAPHICS PUTS PICTURES INTO YOUR PROGRAMS FOR ZX SPECTRUM

1 TAKE ANY PAPER-BASED PHOTO, DRAWING, ETC...

2 ACTION TRACER LETS YOU PUT IT ONTO YOUR SCREEN WITH THE ACCURACY OF A DIGITAL TRACER.

3 COMPILES IT INTO A BASIC PROGRAM THAT WILL EXACTLY REPRODUCE IT. A NORMAL BASIC LISTING APPEARS JUST AS IF YOU'D WRITTEN IT YOURSELF.

POWER-GRAPHICS GIVES YOU FULL DYNAMIC CONTROL OF A CAPTURED IMAGE. YOU CAN INSTANTLY MOVE, RESIZE, STRETCH, STRETCH OR SQUEEZE IT.

Spectrum POWER-GRAPHICS FOR 16/48K £6.99 SOFTWARE

14, WESTERN AVE., RIDOLESDEN, KETTERLEY, YORKS, ENGLAND

CRASH

MICRO GAMES ACTION

We're urgently looking for more full-time editorial staff which includes the posts of **EDITOR and STAFF WRITERS.**

Applicants must be professional writers with a keen interest in computer games and an ability to work in a small unit to tight schedules.

An excellent career opportunity is offered by a rapidly expanding publishing house.

Salaries per annum: **£8000-£12000** (or negotiable) depending on experience.

Applications in writing to:

Roger Kean,
CRASH Magazine,
1/2 King Street,
Ludlow,
Shropshire SY8 1AQ

Or telephone: 0584 5851

3 NEW CBM 64 GAMES
from
bubble bus

JAZZ fast action shooting

CAVE FIGHTER jump, climb and shoot

STRIKE FORCE 3D war game

Available from all good retail outlets or direct from:
Bubble Bus Software, 87 High Street, Tonbridge, Kent TN11 1RX
Telephone: 0732 355962 Telex: 96151

BLANK CASSETTES

* C10's 10 For £3.65; 100 For £25
* C15's 10 For £3.85 100 For £26
* C20's 10 For £4.00 100 For £27 *

Inc. P&P Insurance Library Cases

Fully Guaranteed. Immediate Despatch

U.K. HOME COMPUTERS
82 CHURCHWARD AVE. SWINDON, WILTS.
24 hr Telephone Orders (0793) 695034

GAMESMANSHIP

Min 15% discount on software for all computers

SPECCY	CG4	BBC
Knight Lore £8.45	Storm Warrior £8.80	Football Manager £ 6.95
Fall Guy £5.90	Jet Set Willy £8.90	Fantasia Diamond £ 6.85
Cyclone £5.90	Zaxxon £8.45	Scrabble £13.50
Jasper £5.80	Raid over Moscow £8.45	Manic Miner £ 6.75
Braxx Bluff £5.75	Beachhead £8.45	DRAGON
Avalon £6.75	Ancipital £8.35	Back Track £ 5.45
Underwilde £4.85	Pyjamarama £8.90	The King £ 5.99
Drive In £4.95	Combat Lynx £7.75	Cuthbert Digging £ 5.99
Super Mutt £4.95	Kokotini Wilf £5.90	Cuthbert/Walkabout £ 5.99
Backpackers Guide £6.35	T.L.L. £6.65	Manic Miner £ 6.75
Kung Fu £5.90	Tom Thumb £4.95	AMSTRAD
Psytraxx £6.70	VIC20	Flight Path 737 £ 5.90
Astronut £4.95	Perils of Willy £4.95	Johnny Reb £ 5.90
Zombie Zombie £5.80	Fatty Henry £5.85	Manic Miner £ 7.55
Turmoil £5.90	Hunchback £5.85	
Twin Kingdom V £6.70	Dodos Lair £4.95	
Pyjamarama £5.75	Tom Thumb £4.95	
Frank N Stein £4.80	Oily £5.85	
Travel with Trash £4.95		
Any firebird £2.10		

Large Selection always available for Oric/Atmos Z801 etc

Cheque for lists. State which Micro. Fast Service. Guaranteed originals.
Cheque or P/O to S. Briggs, 65 Cassiobury Ave, Bedford, Middx.
Ring 01-890 5636 for friendly service.

A new image

Two new graphics commands for the CPC 464
by Brian Cadge

The graphics potential of the CPC464 is very promising, as can be seen from some of the first software to become available. However, in Basic the user is restricted to using user designed characters. The disadvantages of these are their size and the fact that only two colours can be present in each cell. To get more colours we have to individually plot the points using *Plot* and *Draw*. This is clearly too slow for fast action games.

Fortunately, it is quite simple to extend the Locomotive Basic (or any other language for that matter), using Resident System Extensions (RSX's). The program presented here gives you two new graphics

commands. Firstly, here is an explanation of how to use the new commands from Basic.

All RSX commands start with the *!* character (obtained using *shift* and *@* together), and these commands are called *Define* and *Place*. Their syntax is:
`!DEFINE, image, width, height`
`!PLACE, image, xpos, ypos`

Notice that a comma appears straight after the command name and before the first parameter. This is essential, as is the *!* character; if either is missed out then you'll get a syntax error.

The first parameter in both commands is *image* which is a number referring to the particular image you wish to address. The

first *image* is numbered 0, the next 1 and so on. The more *images* you want the more memory you must reserve. As set up by the Basic loader you get space for two images, numbered 0 and 1. For every extra *image* you must lower *Himem* by 256 bytes.

Width is the width of the image in screen bytes (not in characters or pixels), there are always 80 column bytes on the screen, and so in *Mode 2* one character is one byte wide, in *Mode 1* a character is two bytes wide, and in *Mode 0* it is four bytes wide. *Height* is the height of the image in characters. The maximum size of an image is 7×4 . This command assumes that the image to be stored is located in the top left of the screen. Therefore, you set up your character using *Plot* etc, and then use *!* *define* to get it off the screen. So in mode 1, to copy the equivalent of one character cell you would use: `! DEFINE, 0, 2, 1.`

continued next week

Basic Listing

```

5 'BASIC LOADER PROGRAM
10 MEMORY 42000
20 FOR I=42700 TO 42955
30 READ A$:V=VAL("&"+A$):CS=CS+V:POKE I,V
40 NEXT I
50 IF CS<>32566 THEN ?"DATA ERROR - CHECK LISTING!":STOP
60 CALL 42700
70 DATA 01,D6,A6,21,D2,A7,CD,D1,BC,C9,DE,A6,C3,EB,A6,C3,22,A7,44,45,46,49,4E
80 DATA C5,50,4C,41,43,C5,00,00,DD,46,04,04,FE,03,20,2E,21,CB,A7,CD,53,A7,DD
90 DATA 7E,02,B7,28,22,E6,07,12,32,D0,A7,DD,7E,00,3D,E6,03,3C,32,D1,A7,1B,12
100 DATA 3E,55,1B,12,21,00,00,CD,1A,BC,22,CE,A7,CD,72,A7,C9,DD,46,04,04,FE,03
110 DATA 20,F7,21,CB,A7,CD,53,A7,1A,32,D0,A7,1B,1A,32,D1,A7,1B,1A,FE,55,20,E2
120 DATA DD,7E,02,3D,67,DD,7E,00,3D,6F,CD,1A,BC,22,CE,A7,CD,A3,A7,C9,25,10,FD
130 DATA 54,5D,01,F0,00,37,ED,42,22,CC,A7,C9,C5,E5,06,08,7E,12,7C,C6,08,67,13
140 DATA 10,F7,E1,C1,C9,ED,5B,CC,A7,2A,CE,A7,ED,4B,D1,A7,41,C5,E5,ED,4B,D0,A7
150 DATA 41,CD,62,A7,23,10,FA,E1,CD,C4,A7,C1,10,EC,C9,C5,E5,06,08,1A,77,7C,C6
160 DATA 08,67,13,10,F7,E1,C1,C9,ED,5B,CC,A7,2A,CE,A7,ED,4B,D1,A7,41,C5,E5,ED
170 DATA 4B,D0,A7,41,CD,93,A7,23,10,FA,E1,CD,C4,A7,C1,10,EC,C9,06,08,CD,26,BC
180 DATA 10,FB,C9

```

Assembler listing

```

10 ;
20 ; CPC464 Graphics extension
30 ;
A6CC 40          ORG 42700
A6CC 50          ENT $
A7CB 60 STACK  EQU $+255
A6CC 01D6A6     70          LD BC,DESPAT
A6CF 21D2A7     80          LD HL,OSBUF
A6D2 CDD1BC     90          CALL #BCD1
A6D5 C9        100         RET
A6D6 DEA6     110 DESPAT DEFW COMMAN
A6D8 C3EBA6   120         JP DEFINE
A6DB C322A7   130         JP PLACE
A6DE 44454649 140 COMMAN DEFM "DEFIN"
A6E3 C5       150         DEFB "E"+128
A6E4 504C4143 160         DEFM "PLAC"
A6E8 C5       170         DEFB "E"+128
A6E9 0000     180         DEFB 0,0

```

Continued on page 46

3D COMPUTERS

THE HOME COMPUTER SPECIALISTS

XMAS BARGAINS

BBC SINGLE DISK DRIVE
200K DOUBLE SIDED CASED,
CABLE, MANUAL, DISK £120

COMMODORE 1520 COLOUR
PRINTER/PLOTTER £57.50

SINCLAIR QL £385

QL14 Monitor £195

230 TOLWORTH RISE SOUTH TOLWORTH
SURREY KT5 9NB TEL: 01-337 4317

Branches at:

Sutton 01-642 2534

Ealing 01-992 5855

Newbury 0635-30047

Luton 0582-458575



DRAGON DISC DRIVES

LIMITED STOCKS — ORDER NOW FOR XMAS—
PRICES INCLUDE VAT AND DELIVERY

DRAGON 64 £185

Single DRAGON Disk Drive with controller £195

Special Offer DRAGON 64 + disk drive + FLEX/ED/
ASM/D BASIC £399.99

SPECIAL XMAS OFFERS

Single disk drive + FLEX/ED/ASM/D BASIC
41only £280.00

plus FREE 10 diskettes with every
order over £250

Please phone or write for availability of FLEX/
DBASIC for TANDY, Double Disk Drives, Disk
Drive Upgrade kits, software for FLEX/OS9/
DRAGON/TANDY COCO

EDIT+ now available for DRAGON FLEX/TANDY
RS-DOS/DRAGON DOS and on cartridge

COMPUSENSE



PO Box 169 Palmers Green, London N13 5XA

Tel: 01-882 0681 (24-hr) and 01-882 6936



LINKWORD

FRENCH
GERMAN
SPANISH
ITALIAN

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

Mike McCann, Your Computer.

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

Peter Marsh, Training Manager,
Thomson Holidays.

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

Jane Bird, Sunday Times.

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

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

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

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

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

"An outstanding success"
Personal Computer World.

FOR SCHOOLWORK FOR BUSINESS
FOR HOLIDAYS FOR ALL AGES

Linkword Language Courses are published on

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

All versions contain a programme
an audio tape and glossary.

(Prices from £12.95)

Versions available from
Boots, Smiths and leading retailers.

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

		190			
		200			
A6EB	DD4604	210	DEFINE	LD	B,(IX+4)
A6EE	04	220		INC	B
A6EF	FE03	230		CP	3
A6F1	202E	240		JR	NZ,EXIT
A6F3	21CBA7	250		LD	HL,STACK
A6F6	CD53A7	260		CALL	GETADR
A6F9	DD7E02	270		LD	A,(IX+2)
A6FC	B7	280		OR	A
A6FD	2822	290		JR	Z,EXIT
A6FF	E607	300		AND	7
A701	12	310		LD	(DE),A
A702	32D0A7	320		LD	(HORL),A
A705	DD7E00	330		LD	A,(IX+0)
A708	3D	340		DEC	A
A709	E603	350		AND	3
A70B	3C	360		INC	A
A70C	32D1A7	370		LD	(VERL),A
A70F	1B	380		DEC	DE
A710	12	390		LD	(DE),A
A711	3E55	400		LD	A,85
A713	1B	410		DEC	DE
A714	12	420		LD	(DE),A
A715	210000	430		LD	HL,0
A718	CD1ABC	440		CALL	#BC1A

HISOFT ULTRAKIT £9.45

The most powerful toolkit yet for ZX BASIC. All the features you will ever need; AUTO insert, full RENUMBER, block DELETE, CLOCK, ALARM, error trapping, break trapping. Full TRACE with single-step and much, much more. Makes ZX BASIC easy-to-use and powerful.

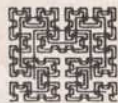
DEVPAK £14

An excellent assembler, an advanced line-editor, a comprehensive disassembler and a superb 'front panel' debugger all in one package. Used by many leading software houses to write their games. "Buy it!" Adam Denning 1984.

PASCAL £25

A powerful and almost full implementation of Pascal - not a Tiny Pascal. A valuable educational and development tool, programs typically run 40 times faster than a BASIC equivalent. Spectrum version includes Turtle Graphics package. "I haven't seen any other compiler that could match Hisoft's Pascal!"

All prices, UK delivered, relate to 48K ZX Spectrum versions.



HISOFT

180 High Street North
Dunstable, Beds. LU6 1AT
Tel: (0582) 696421



HISOFT presents

FONT 464 for the AMSTRAD CPC 464

FONT 464 is a font designer and character generator especially developed for the CPC 464 microcomputer.

Design your own character fonts and graphic symbols with this very friendly and powerful package.

FONT 464 allows you to create a new design or amend an existing one using set, reset, invert, reflect, rotate, inverse and even animation!

Load and save character sets to/from tape, use the new character(s) from BASIC, design your own animated graphics - all this and more with FONT 464.

FONT 464 is supplied with three interesting and amusing character sets for you to experiment with.

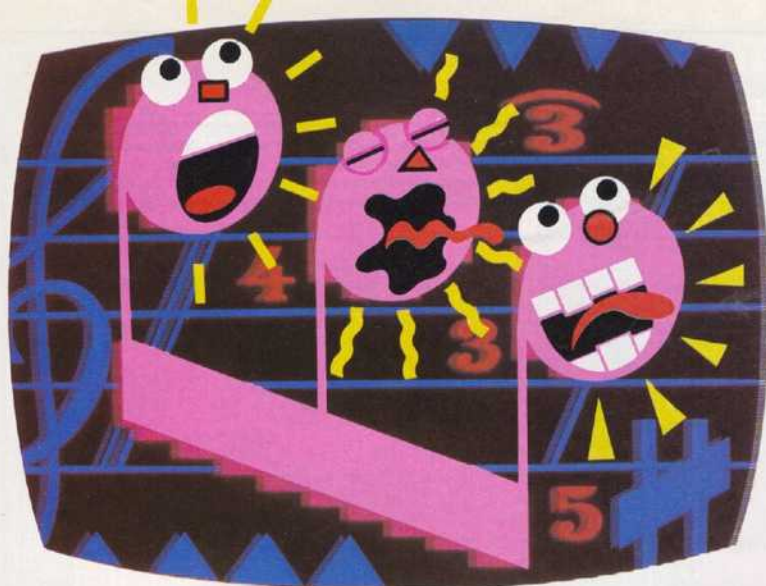
* All this power for: £7.95 inclusive *

We also have available for the Amstrad CPC 464:

Hisoft Devpac - our full Z80 assembler and disassembler/debugger with more features than you'll ever need.

Hisoft Pascal - a virtually full implementation of Standard Pascal. Compiles and executes incredibly quickly.

Please write to Hisoft for more details of Pascal and Devpac on the CPC 464 or contact Amsoft with your order.



notes all at the same time).

At the press of a button, you can summon up pre-programmed rhythms and bass accompaniments to play along to.

These three rhythm combinations can be speeded up or slowed down.

You can even glissando (so long as you don't hurt yourself.)

That is, make a note slide up in pitch.

You can filter sound: reduce the treble, the bass, or both. You can save, on cassette or disk, a voice or tune for future use.

And, for better sound reproduction, you can connect

MAKE MUSIC YOUR FORTE.

Alright, let's all gather round the computer for a good old sing-song.

You'll find the new Commodore 64 Music Maker strikes exactly the right note, whether you're an accomplished musician or whether you are an out-and-out beginner.

If you can hum and know your ABC, you can start to play famous popular tunes immediately.

No matter if you've never played a note before.

Simply type in the notes from the SFX Tutor Handbook,

MUSIC MAKER DISK OR CASSETTE £29.95.

then tap in the rhythm.

And, before you can even say 'Richard Clayderman,' the automatic playback fills the room with music.

Once you've become a 'piano' virtuoso, you'll quickly appreciate the other amazing capabilities.

You can synthesize musical instruments, even create your own 'synth' electronic sounds.

You can play notes polyphonically.

(This is the smart way of saying you can play three different

Music Maker to your hi-fi system.

Music Maker has been designed, like all our software, to get the very best out of Commodore hardware.

It's the first in a series of packages which will fully exploit the Commodore 64's outstanding musical capabilities.

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



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

Hex Converter

on Amstrad

```
1 REM Converted from VIC20 program
2 REM previously published in PCW
3 REM Conversion by R J Hosford 1/8/84
4 REM *****
5 MODE 1
6 s# = "
7 CLS
8 FOR i=7 TO 19
9 LOCATE 10,3:INPUT "decimal number";a#: v=VAL(a#)
10 LOCATE 10,3:PRINT s#
11 IF v < 0 OR v>65535 THEN 9
12 h=INT(v/256):l=v-256*h
13 PRINT:PRINT"    DEC HI LO HEX"
14 LOCATE 6,i:PRINT RIGHT$(" "+STR$(v),5)+" ";
15 PRINT RIGHT$(" "+STR$(h),3)SPC(2)RIGHT$(" "+STR$(l),3);
16 z=h:GOSUB 26:h=c#
17 z=l:GOSUB 26:l=c#
18 PRINT SPC(3)+"#h+l#
19 NEXT i
20 PRINT d#:PRINT"continue ? y\n"
21 LOCATE 10,22:INPUT a#:IF a#=" " THEN 21
```

This program is a standard Decimal to Hex Converter, which is itself a conversion from a Vic 20 program ... confusing, isn't it?

Nevertheless, it should be of interest to us Amstrad CPC464 users.

```
22 IF a#="y" THEN 7
23 IF a#(">") THEN 21
24 END
25 REM
26 x=INT(z/16):y=z-16*x
27 IF x < 10 THEN x# = RIGHT$(STR$(x),1):GOTO 30
28 ON x-9 GOSUB 35,36,37,38,39,40
29 x#=t#
30 IF y < 10 THEN y# = RIGHT$(STR$(y),1):GOTO 33
31 ON y-9 GOSUB 35,36,37,38,39,40
32 y#=t#
33 c#=x#+y# : RETURN
34 REM
35 t#="A": RETURN
36 t#="B": RETURN
37 t#="C": RETURN
38 t#="D": RETURN
39 t#="E": RETURN
40 t#="F": RETURN
```

Hex Converter
by R Hosford

Arcade Avenue



On the Amstrad

I was very pleased to receive the first couple of letters to the column from Amstrad owners. The first is from James Marshall of unknown abode who has written about the game *Roland on the Ropes* adapted from the Spectrum Quicksilver release *Fred*. "For those who are disenchanted with the game due to the enormous amount of inhabitants dwelling in the tombs, can I say don't give up. On getting out of the fourth level, and every screen from then on, you are given the opportunity to select the number of ghosts, mummies and skeletons, etc that appear which is much better than leaving it to the computer. Also the speed of

the game greatly increases and the mazes become more complex. In fact I would say that the game really begins after level 4. I have managed to complete 37 levels and my score has completely turned the clock. PS. Keep up the great work — this mag really interacts with the readers."

Richard Couchman of St. Ives writes about Ansoft's *Harrier Attack*. "I was at first very disappointed as the graphics were the same as the Spectrum version and still flickery. The sound was better but didn't use the machine's facilities to the full. But after a few games I made it back to the ship and found that it actually allows you to take off again."

Thanks to both of you for your comments and I look forward to hearing more about this machine. So much Amstrad software is a conversion of Spectrum games, presumably because the authors are most familiar with Z80 code, but keep an eye out for Anirog's games as they seem to be one

of the very few companies converting Commodore games to the machine even though the 464 has similar facilities.

I was also very pleased to hear from N.J. MacArthur of the Isle of Tiree in Scotland who writes about *Chuckie Egg*. "I would highly recommend this to any Dragon owner — it is very enjoyable even though it does not get faster after level 26 making it lose a bit of its competitive edge. Having read of a score of over one million in a recent PCW, I set out to beat this and after 7½ hours of continuous play I had to give up with a record score of 4,081,790 on level 208 with over 50 lives left." Well how do you beat that? I think it proves the quality of the game — many games I see can't retain my interest for even seven minutes.

Two people have written in response to B.P. Jay's score on *Full Throttle*. Mark Gill of Leeds has completed 7 circuits on 4 lap races and Silverstone, Italy and Yugoslavia in 3 laps. His tip is to accelerate all the

time and skid off the track to pass other bikes. Stuart Young has finished all 10 circuits on 2 laps by the 17th August after having the game for only 11 days. "The way to succeed is to stay at the edge of the track and the outside of bends to avoid crashes." This arcade wizard has also scored 64,250 on *Pole Position* and 10030 on *Stop the Express* which beats the 6400 scored by Colin Johnson of Bishop Auckland in County Durham. Colin has, however, achieved the huge score of 258800 and 95% on *Sabre Wulf* even though he had only found 3 pieces of the Amulet!

Tony Kendle

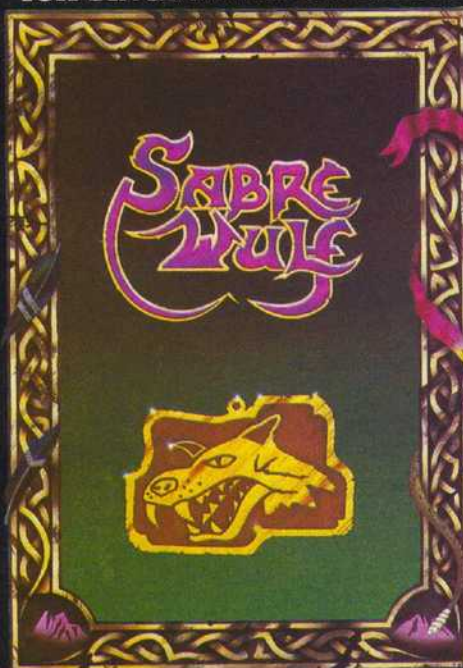
The Arcade Corner is a new section for anyone who enjoys playing arcade games. If you have any comments, from playing tips on difficult games or programs you'd particularly like to praise (or blame!) then write to: Tony Kendle, Arcade Avenue, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

48K SINCLAIR ZX SPECTRUM

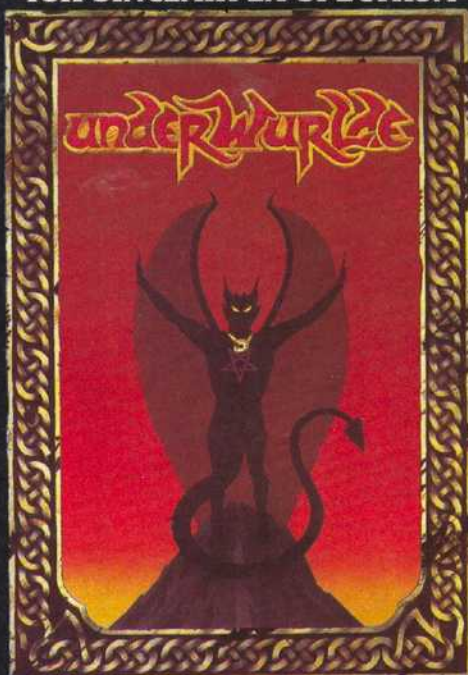


BBC MODEL B 1·2 OS

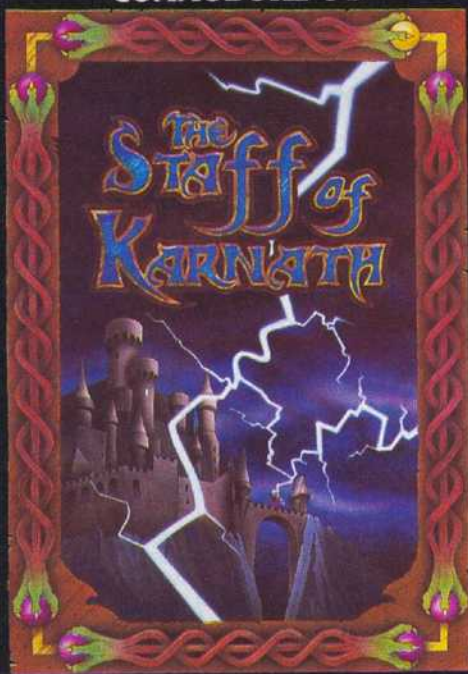
48K SINCLAIR ZX SPECTRUM



48K SINCLAIR ZX SPECTRUM



COMMODORE 64



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

Memory Scan

on Commodore 64

This program will display any portion of memory as 40 column CBM ASCII, dis-

playing all unprintable codes as ".".

Simply enter the start and end address of the memory to be examined. (To scan from the beginning of memory hit return instead of entering an address. To scan to the end of memory hit return instead of the end address.)

The scan may be paused by holding the Space bar or slowed down by using the *Ctrl* key. To abort scan use the *Run/Stop* key.

If you stop the program using the *Run/Stop* key you may find the approximate address of the last line displayed by typing "goto 200" followed by *Return*.

```

10 PRINT CHR$(147)
20 FOR L=49152 TO 49216: READ A: T=T+A: POKEL,A: NEXT
30 IF T(<)9111 THEN PRINT"DATA ERROR": STOP
40 INPUT"ENTER START ADDRESS":A
50 INPUT"ENTER END ADDRESS":E
60 X=INT(A/256): Y=A-(X*256)
70 POKE 49157,X: POKE 49153,Y: POKE 49210,INT(E/256)
80 SYS 49152
90 :
100 DATA 160,000,132,251,169,000,133,252
110 DATA 177,251,201,032,144,028,201,127
120 DATA 144,004,201,160,144,028,032,210
130 DATA 255,166,197,224,060,240,250,032
140 DATA 225,255,240,028,200,240,011,076
150 DATA 000,192,169,046,032,210,255,076
160 DATA 025,192,165,252,024,105,001,133
170 DATA 252,201,255,240,003,076,039,192
180 DATA 96
190 :
200 PRINT PEEK(252)*256+PEEK(251)

C000 A0 60      LDY #50
C002 84 FB      STY #FB
C004 A9 00      LDA #00
C006 85 FC      STA #FC
C008 B1 FB      LDA (#FB),Y
C00A C9 20      CMP #20
C00C 90 1C      BCC #C02A
    
```

```

C00E C9 7F      CMP #57F
C010 90 04      BCC #C016
C012 C9 A0      CMP #5A0
C014 90 14      BCC #C02A
C016 20 D2 FF JSR #FFD2
C018 A6 C5      LDX #C5
C01B E0 3C      CPX #53C
C01D F0 FA      BEQ #C019
C01F 20 E1 FF JSR #FFE1
C022 F0 1C      BEQ #C040
C024 C9        INY
C025 F0 06      BEQ #C032
C027 4C 03 C0 JMP #C008
C02A A9 2E      LDA #2E
C02C 20 D2 FF JSR #FFD2
C02F 4C 19 C0 JMP #C019
C032 A5 FC      LDA #FC
C034 18        CLC
C035 69 01      ADC #01
C037 85 FC      STA #FC
C039 C9 00      CMP #00
C03B F0 03      BEQ #C040
C03D 4C 27 C0 JMP #C027
C040 60        RTS
    
```

Memory Scan
by I Bennett

The Music Box



Digital sample

News from Autographics, makers of the Microsound add-on keyboard for the Commodore 64. The eagle-eyed among you may have noticed the company advertising a new version of their keyboard. As I write, this is not yet available. However, if the new keyboard is everything it promises to be, then you would be wise to get in the queue.

The original Microsound received very good reviews when it first came out. Now, Glyn Williams of Autographics tells me, the music keyboard has been improved in appearance and performance and the hardware and software to

add comprehensive digital sampling is having the finishing touches put to it.

Digital sampling is all the rage at the moment. In essence, the technique is a way round the problems of digitising the signals from an analogue musical instrument (as dealt with in an earlier column). Instead of having to convert a whole piece of music into digital form for storing and processing in your computer, a sampler takes a typical note (in fact, any sound at all can be used), converts it into digital form and then uses the data from this conversion to produce an entire range of notes from a musical keyboard.

Professional digital samplers have been widely used in the music business for two or three years now, the best-known device being the Fairlight CMI 'music computer'. But the Fairlight and similar devices retail for the price of a small house or flat.

The price of the new Microsound (£195 for the keyboard

and software plus £295 for the digital sampler and software) make it potentially one of the most exciting computer music developments around. A complete package from scratch — including computer, disk drive, monitor and Microsound — would set you back about £1000.

Glyn Williams tells me that, along with standard sampling features, the new Microsound will feature MIDI, modulation of sampled sounds using the 64's SID chip and a split keyboard enabling you to play two different instrumental sounds at once. Impressive.

At present, everyone is rushing to buy the DS:3 sampler from Greengate, a company formed by the experimental band Mainframe and some computer-wise friends. The DS:3 is designed for an Apple IIe (or equivalent) system and costs £450 plus VAT, including hardware, software and a small music keyboard (but without the Apple gear). A complete system sells for £1400.

I must say that if the Microsound turns out to be half as good as the DS:3, Autographics will be on to a winner. To hear what digital sound sampling can do — with no outside assistance — look out for Mainframe's 12-inch record, *Into Trouble with the Noise of Art* (on the YYY label). You can write to Greengate at 24 Missenden Drive, Hemel Hempstead, Herts HP3 8QR (tel: 0442 3496) and to Autographics at PO Box 14, Petersfield, Hants GU32 1HS (tel: 073087 403).

Gary Herman

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

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

SOFT BYTES

SPECTRUM

GAME	RRP	OUR PRICE
CYCLONE	5.95	4.75
DALEY THOMPSON	6.90	4.99
BEACHHEAD	7.95	5.95
WHITE LIGHTNING	14.95	10.50
SHERLOCK HOLMES	14.95	10.50
SABRE WOLF	9.95	6.95
KNIGHTS LORE	9.95	6.95
UNDERWORLD	9.95	6.95
LORDS OF MIDNIGHT	9.95	5.95
DOOMDARKS REVENGE	9.95	5.95
PSYTRON	7.95	5.95
FRANK N. STEIN	5.95	4.50
T.L.L.	5.95	4.50
TRASHMAN	5.95	4.50
NIGHT GUNNER	6.95	4.95
CLASSIC ADVENTURE	6.95	5.25
MONTY MOLE	6.95	5.50
FULL THROTTLE	6.95	5.75
MATCHPOINT	7.95	6.75
TWIN KINGDOM VALLEY	7.95	6.75
AVALON	7.95	5.25
ENDURO	7.95	5.50
SCRABBLE	15.95	4.75
EDDIE KIDD JUMP	7.95	4.95
COMBAT LYNX	7.95	5.25
KOKOTONI WOLF	5.95	4.75
DUSES EX MACHINA	15.00	10.75
DARK STAR	7.95	4.95
JET SET WILLY	5.95	4.50
STAR STRIKE	5.95	4.50
TRAVEL WITH TRASHMAN	5.95	4.50
HAVOC	7.95	5.95
BACKPACKERS GUIDE TO QUASIMODOS REV.	7.50	4.95
TIR NA NOG	6.90	4.90
TIR NA NOG	9.95	6.95
AIRWOLF	6.90	5.25

MATCHDAY	7.95	4.90
PYJAMARAMA	6.95	5.25
BATTLE CARS	7.95	5.95
D DAY	7.95	5.95
TOWER OF DESPAIR	7.95	5.95
LODE RUNNER	9.95	7.25
GREAT SPACE RACE	14.95	11.25
POTTY PIGEON	6.95	5.25
PITFALL II	7.95	5.95
VALKYRIE 17	9.95	6.95
RAM TURBO INTERFACE	18.00	
MATCHPOINT	7.95	6.50
GIFT OF THE GODS	9.95	7.95
KUNG FU	6.95	4.95
TRIPPODS	11.50	8.50
BOULDER DASH	7.95	5.95
SPIDER MAN	9.95	7.25

COMMODORE 64

GAME	RRP	OUR PRICE
GHOSTBUSTERS	10.95	8.50
SUICIDE EXPRESS	7.95	6.50
OTHER ACTIVISION	9.95	7.25
ZIM SALA BIM	9.95	6.95
STRIP POKER	9.95	6.95
PSYTRON 64	7.95	5.25
TALES OF ARABIAN NIGHTS	7.00	3.75
BEACHHEAD	9.95	7.50
SOLO FLIGHT	14.95	11.00
DEATH STAR INTERCEPTOR	9.95	7.50
BRUCE LEE	9.95	7.50
NATO COMMANDER	9.95	7.50
SPITFIRE ACE	9.95	7.50
MY CHESS II	11.95	8.25
BATTLE FOR MIDWAY	8.95	4.95
HAVOC	9.95	7.50
ANCIPAL	7.50	5.50
QUASIMODOS REVENGE	7.90	5.90

T.L.L.	7.90	5.90
KOKOTONI WOLF	6.95	5.25
ZAXXON	9.95	7.50
SUMMER GAMES	14.95	10.50
QUO VADIS	9.95	7.50
SHERLOCK	14.95	10.50
PSI WARRIOR	9.95	7.50
STORM WARRIOR	8.95	4.90
RAID OVER MOSCOW	9.95	7.50
STAFF OF KARNATH	9.95	7.25
BLUE MAX	9.95	7.50
TAPPER	9.95	7.50
SELECT 1	12.49	8.50
SPY VS SPY	9.95	7.50
BOULDER DASH	8.95	7.25
HOBBITT	14.95	9.99
DALEY THOMPSONS DECATH.	7.90	5.50
KONG'S REVENGE	7.90	5.90
FIGHTER PILOT	9.95	7.50
TORNADO LOW LEVEL	7.90	5.90
BREAKFEVER	7.00	4.95
COMBAT LYNX	8.95	6.95
WHITE LIGHTNING	19.95	15.95
BLACK HAWKE	7.95	4.50
RIVER RESCUE	7.95	4.50
STORM WARRIOR	8.95	4.95
SPIDERMAN	9.95	7.25

ALL PRICES INCLUDE P&P

QUICKSHOT II ONLY £8.99

PLEASE NOTE IF OUR ORDER

EXCEEDS £50 YOU GET

10% FURTHER DISCOUNT

SEND CHEQUES P.O. TO

GOODBYE PCW II

94 LEATHER LANE, LONDON EC1

(TEL: 01-404 4245)

PLEASE STATE WHICH MICRO

NOW 3RD GREAT YEAR!

TAPE HIRES

SPECTRUM 2X81 and COMMODORE 64 TAPES

HUGE RANGE! ADVENTURE GAMES, SIMULATION GAMES, BUSINESS and PRAGMATICAL PROGRAMS, UTILITIES, M/C COMPILERS, EDUCATIONAL PROGRAMS, 60 TOP SUPPLIERS.

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

LIFE MEMBERSHIP £5.00 TAPE HIRES FROM 50P INCLUDING VAT.

OVER 10,000 DELIGHTED MEMBERS!

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

To: SOFTWARE LIBRARY, Farnham Road, West Liss, Hants GU33 6JU.

NAME..... Machine.....

ADDRESS.....

THE ORIGINAL SOFTWARE LIBRARY

Special offer from this issue: **LIFE MEMBERSHIP £5** (normally £9.50). Overseas (Europe only) £8, or join local branch in N.Y., Germany, France, Holland, Belgium, Scandinavia, South Africa, Ireland—send Int. Reply Coupon and we'll forward your enquiry.

PCWK

THE MEGASAVE FANTASTIC SAVINGS

SPECTRUM	RRP	OUR PRICE	COMMODORE	RRP	OUR PRICE
KNIGHT LORE	8.50	5.50	TIR NA NOG	8.50	5.50
CYCLONE	5.85	4.50	ASTRONUT	8.50	5.50
VALKYRIE 17	8.75	5.50	MUTANT MONY	5.95	4.50
GREAT SPACE RACE	12.95	8.50	SKY RANGER	4.95	3.50
BATTLE CARS	6.85	4.50	GOLDER DASH	6.85	4.50
KNIGHT LORE	8.50	5.50	JEWELS OF BABYLON	4.50	3.50
UNDERWORLD	8.50	5.50	SON OF BLAGGER	4.95	3.50
TRAVEL TRASHMAN	7.50	5.50	HOUSE JACK BUILT	6.65	4.50
PYJAMARAMA	5.95	4.50	MACHINE LIGHTNING	17.50	11.50
DOOMDARKS REVENGE	8.50	5.50	GHOSTBUSTERS	8.50	5.50
ZOMBIE ZOMBIE	5.85	4.50	STAR STRIKE	4.95	3.50
STEVE DAVIS SNOOKER	6.85	4.50	SPIDER MAN	8.50	5.50
DUSES EX MACHINA	12.95	8.50	KONG STRIKES BACK	5.85	4.50
POTTY PIGEON	5.95	4.50	HUNCHBACK II	6.85	4.50
SKOOL DAZE	4.95	3.50	GIFT FROM THE GODS	8.50	5.50
TURMOIL	5.85	4.50	TRIPPODS	9.75	7.25
FALL GUY	5.95	4.50	ALIEN	7.85	5.50
LORDS OF MIDNIGHT	8.50	5.50	LEGEND	12.95	8.50
MONTY MOLE	5.85	4.50	KUNG FU	5.25	4.50
DEATHLON (DALEYS)	5.85	4.50	MATCH DAY	5.50	4.50
BEACHHEAD	6.85	4.50	STAFF OF KARNATH	8.50	5.50
AMERICAN FOOTBALL	8.50	5.50	GHOSTBUSTERS	8.50	5.50
COMBAT LYNX	6.85	4.50	CHIMERA	6.85	4.50
FRANK N. STEIN	4.95	3.50	FIGHTER PILOT	6.85	4.50
EUREKA	12.95	8.50	BOULDER DASH	7.85	5.50
KUNG FU	5.85	4.50	SUICIDE EXPRESS	6.85	4.50
PSI WARRIOR	6.85	4.50			
RAID OVER MOSCOW	8.50	5.50			
PSYTRON	6.85	4.50			
AMERICAN FOOTBALL	8.50	5.50			
CURRANT SPEECH	27.50	17.50			
SPY VS SPY	8.50	5.50			
TAPPER	8.50	5.50			
BLUEMAX	8.50	5.50			
MATCHPOINT	8.50	5.50			
CAD CAM WARRIOR	8.50	5.50			
MOTOR CROSS	6.85	4.50			
SPACE SHUTTLE	6.85	4.50			
WHITE LIGHTNING	17.50	11.50			
JACK ATTACK	12.95	8.50			
SPRINT OF THE STONE	12.95	8.50			
MUTANT MONY	5.95	4.50			
HUNCHBACK II	6.85	4.50			
SUICIDE STRIKE	6.85	4.50			
B.C.'S QUEST	8.50	5.50			
POST & PACKAGING FREE					
STATE WHICH MICRO FAST SERVICE					
SEND CHEQUE P.O. TO: MEGASAVE Dept 1, 76 Westbourne Terrace, London W2					

SOFTINSIGHT DISCOUNT SOFTWARE

SPECTRUM	RRP	OUR PRICE	SPECTRUM	RRP	OUR PRICE	SPECTRUM	RRP	OUR PRICE
SHERLOCK HOLMES	14.95	11.00	PITFALL 2	7.99	6.29	POTTYRION	7.95	6.29
SPACE SHUTTLE	7.99	6.29	FLIGHT FROM THE	8.95	7.40	SPACE GAMES	14.95	11.00
ZOMBIE ZOMBIE	5.85	4.50	OVOR	5.50	4.40	GAMES CREATOR	12.95	10.50
LOAD RUNNER	6.85	4.50	KAUJIN	5.50	4.40	QUO VADIS	9.95	7.50
ASTRONUT	8.50	6.50	HOUSE JACK BUILT	6.65	4.50	FINFIGHT	3.95	2.50
FALL GUY	5.95	4.50	SUNDE DASH	5.95	4.70	WHITE LIGHTNING	17.50	11.50
STAR STRIKE	4.95	3.50	GOLDER DASH	6.85	4.50	COMBAT LYNX	8.95	6.95
AIR WOLF	6.85	4.50	KUNG FU	6.85	4.50	BATTLE FOR MIDWAY	9.95	7.40
SKY RANGER	4.95	3.50	TURMOIL	6.85	4.50	SOLO FLIGHT	14.95	11.00
SON OF BLAGGER	4.95	3.50	GREAT SPACE RACE	14.95	11.25	DOOMDARKS REVENGE	9.95	7.50
PYJAMARAMA	5.95	4.50	MATCHDAY	7.95	6.40	EUREKA	14.95	11.00
DOOMDARKS REVENGE	8.50	5.50	BLACKBOX	7.95	6.40	SELECT	12.95	10.50
DALEY THOMPSONS DECATH.	7.90	5.50	ALL JAMSDOT GAMES	8.95	7.00	PIJAMAMA	6.95	6.29
TRAVEL WITH TRASHMAN	6.85	4.50	STEVE DAVIS SNOOKER	7.95	6.40	GHOSTBUSTERS	10.95	8.50
MARK STAR	7.95	6.40	FRANK N. STEIN	4.95	3.50	WHITE LIGHTNING 64	19.95	14.50
DAILY'S DECATHLON	6.85	4.50	COMBAT LYNX	6.85	4.50	COMBAT LYNX	8.95	7.40
RETURN TO EDEN	9.99	7.50	BATTLE CARS	7.95	6.40	SPIDERMAN	9.95	7.40
ALL LEVELS V	9.99	7.50	D DAY	7.95	6.40	EDDIE KIDD	7.95	6.40
LORDS OF MIDNIGHT	9.95	7.50	TIR NA NOG	6.95	5.25	MATCHPOINT	7.95	6.40
DOOMDARKS REVENGE	9.95	7.50	TRASHMAN	7.95	6.40	SPIDERMAN	9.95	7.40
MONTY MOLE	6.95	5.25	WHITE LIGHTNING	14.95	10.40	BLACK THUNDER	8.95	7.20
BATTLE CARS	7.95	6.40	SELECT 1	14.49	8.00	B.C.'S QUEST	8.95	7.20
D DAY	7.95	6.40	PROFFER PIGEON	6.95	5.25	ELECTION	12.95	10.50
TIR NA NOG	6.95	5.25	STEVE DAVIS SNOOKER	7.95	6.40	ELITE	12.95	10.50
TRASHMAN	7.95	6.40	EUREKA	14.95	11.00	SABRE WOLF	9.95	7.40
WHITE LIGHTNING	14.95	10.40	UNDERWORLD	9.95	7.50	ALL OFF'S GOLD	9.50	7.40
SELECT 1	14.49	8.00	KNIGHTS LORE	8.95	7.60	STAFF OF KARNATH	8.95	7.60
POTTY PIGEON	6.95	5.25	GHOSTBUSTERS	10.95	8.20	THE PENCIL	14.95	11.50
STEVE DAVIS SNOOKER	7.95	6.40	TOWER OF DESPAIR	7.95	6.20	WALKER 17	9.95	7.50
EUREKA	14.95	11.00	VALKYRIE 17	9.95	7.20	ALL ACTIVISION	9.95	7.50
UNDERWORLD	9.95	7.50	CYCLONE	5.95	4.50	ALL LEVELS	9.95	7.50
KNIGHTS LORE	8.95	7.60	SPIDERMAN	7.95	6.40	GALACTIC	7.95	6.40

Base Attack

on Vic20

This is a fun Space Wars program written for the unexpanded Vic 20 called *Base Attack*. Can you thwart the Invasion of the Groggs?

Program Notes

5-10	Prints instructions and sets up screen.	250-5095
36-47	Data for characters.	
126-170	Clears the screen and gives positions for you and the Groggs.	
180-240	Puts you, your base, your boundaries and the Groggs onto the screen.	9000-10115 15000-15030

Main Routine which allows you to move left, right and fire. It also allows the Groggs to move randomly. The score routine is also contained here. Sounds an explosion and informs you that you have been invaded. Try again routine.

```
0 OPEN4,4:CMD4
1 LIST
5 POKE36879,104
6 GOTO49999
7 POKE36878,15
10 POKE36869,255
36 FORS=7168TO7168+79:READF:POKES,F:NEXT
37 DATA0,0,0,0,0,0,0
38 DATA24,153,165,102,36,102,126,153
39 DATA66,0,66,0,66,0,66,0
40 DATA255,153,153,255,255,153,153,255
41 DATA24,36,90,255,126,66,36,195
42 DATA36,90,165,102,36,0,20,129
43 DATA60,66,153,129,126,36,66,153
44 DATA129,195,165,153,153,165,195,153
45 DATA24,153,255,24,60,66,66,129
46 DATA60,66,90,219,219,90,66,60
47 DATA252,128,128,252,6,6,6,254
126 B=8174
```

Microradio

GW6JJN



Signalled

Once more PNP Communications of 62 Lawes Avenue, Newhaven, East Sussex, BN9 9SB, deserve a mention. For all those Amstrad Owners out there who write into the magazine asking where the software is, ask no more. PNP is into programming the Amstrad for the radio enthusiast. Their first program for this machine is a Morse Tutor. Five modes of operation are possible. Firstly a structured tutor in itself, letters that need to be practiced can be specified. It has a library of words that can be randomly selected and text to be translated into morse can be entered from the keyboard. In

addition, a data cassette can be prepared under program control to feed in when required.

Over two hundred words are available from the program's library which have been specially chosen to cover the widest possible range of letter groups. Further words or text can be loaded from a previously prepared data cassette which is useful in setting up a dummy run of the morse test itself. A separate program is supplied to help set up the data cassette.

The speed range is from 4 to 24 words per minute which is more than adequate for the amateur. Figures are included in a separate section of the tutor although they can be mixed with letters if required. Morse Tutor for the Amstrad CPC464 costs £8.90 and is available direct from PNP.

Almost in the same breath, PNP announced a new, multi-standard RTTY/Morse code Terminal Unit. It is what they call a matched filter type unit

and it is for receive only. Aimed primarily at the serious short-wave listener, the unit is suitable for interfacing a communications receiver to any home micro. The matched filter/rectifier/integrator design makes it eminently suitable for demodulating Morse Code.

The unit consists of two active filter chains. One is fixed at 1275Hz for SPACE and the other is electronically switched to either 1445Hz for 170Hz shift or 1700Hz for 425Hz shift or 2125Hz for 850Hz shift MARK signals. It is this channel used for Morse decoding. There is also an ALC system to cater for a wide range of input signals and to compensate for fading, etc. In addition, a bar-graph type tuning indicator is provided to enable the accurate tuning of RTTY.

This terminal unit is also suitable for signals in excess of 200 baud and for the reception of AMTOR. All connections are by neat plugs and sockets and is supplied as a built and

aligned unit complete with mains transformer. At the moment, only a built unit can be supplied but PNP say that a kit will be available shortly. The PNP multi standard terminal unit costs £32.50 plus VAT and more details can be had by calling PNP on 0273 514465.

News just in for Spectrum owners is that there is now a program for the 48K Spectrum that will transmit and receive RTTY actually without any interface at all. Just load the program and go. All input and output is via the Ear and Mic sockets. I hope to review this new program very soon in Microradio, but until then contact GIFTU on 0246 810652 for more details.

Ray Berry

This series of articles is designed for radio and microcomputer enthusiasts alike. If you have any queries that you want answered, hints and tips to share, or topics that you would like to see covered, write to: Ray Berry, Microradio, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

```

128 FORE=7680T08185:POKEE,0:NEXTE
130 A(1)=7746
140 A(2)=7812
150 A(3)=7878
160 A(4)=7944
170 A(5)=8010
180 POKE8185,3:POKE8164,3:POKE8141,9
190 POKEB,1
200 POKEA(1),4
210 POKEA(2),5
220 POKEA(3),6
230 POKEA(4),7
240 POKEA(5),8
250 X=INT(RND(1)*5)+1
260 IFX=1THEN1000
270 IFX=2THEN2000
280 IFX=3THEN3000
290 IFX=4THEN4000
300 IFX=5THEN5000
350 GETA$
360 IFA$="0"THENGOTO6000
370 IFA$="1"THENGOTO7000
380 IFA$=CHR$(32)THENPOKE36876,222
      FORT=1T060:NEXTT:POKE36876,0:GOTO8000

```

Book Ends



Book *Giant Book of Spectrum Arcade Games*
 Price £3.95 Micro Spectrum 48K
 Supplier Fontana Paperbacks, 8 Grafton Street, London W1X 3LA

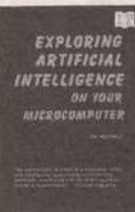
Is there really a sub-cult of Spectrum owners who prefer to spend longer typing in a game than they will playing it? Publishers seem to think so because they continue to churn out volumes of listings, many of which are presumably destined for Father Christmas's sack.

Most of these books cause feelings of déjà-vu for the reviewer, but at least this one contains a few new ideas and avoids the almost inevitable adventure by concentrating on arcade games.

The inclusion of a few machine code routines give the games an edge on purely Basic

versions, and notes to aid modification are also useful, but I still fail to see the attraction of such books. At least this one is cheap.

John Minson



Book *Exploring Artificial Intelligence On Your Microcomputer*
 Price £4.95 Supplier Interface Publications, 9-11 Kensington High Street, London W8 5NP

Will a computer one day write as many books as Tim Hartnell? This practical introduction to the much-discussed topic of A.I. is one of his better offerings.

Four main areas are examined: simulating thought, games playing, language recognition and expert systems. Each section contains several listings, the development and workings

of which are explained. There is also some historical context, expanded by a useful bibliography.

The lack of an index is unfortunate, and I don't like the type setting, but the inclusion of an appendix on structured programming is welcome.

While it is not perfect, this book provides a useful introduction to A.I. for owners of machines with MSX or Micro-soft compatible Basics; Sinclair owners will have to do some conversion work first, though.

John Minson



Book *Business Programming On Your Commodore*
 Price £4.95 Supplier Phoenix Publishing Associates Ltd., 14 Vernon Road, Bushey, Herts WD2 2JL

A collection of listings with a

difference, aimed not at the arcade kid but the micro-shy sales or marketing manager.

The book does not aim to teach Basic in its 150 pages, but it does explain the role of computers in an area of business where they are often neglected.

It introduces some concepts of the language, and presents various data-handling programs with lengthy comments on their construction, logic and use.

It is not an 'idiot's guide' but is user-friendly and, providing enough time is devoted to understanding the examples, it should prove useful. I suspect that its philosophy of 'write your own' is a trifle optimistic, but it could help businessmen understand and evaluate bought-in software more fully.

John Minson

```
400 GOTO250
1000 Y=INT(RND(1)*30)+1
1005 IFA(1)=7500THEN350
1010 A(1)=A(1)+Y
1020 POKER(1),4:POKER(1)-Y,0
1030 IFA(1)=>8141THEN9500
1040 GOTO350
2000 Y=INT(RND(1)*25)+1
2005 IFA(2)=7500THEN350
2010 A(2)=A(2)+Y
2020 POKER(2),5:POKER(2)-Y,0
2030 IFA(2)=>8141THEN9500
2040 GOTO350
3000 Y=INT(RND(1)*15)+1
3005 IFA(3)=7500THEN350
3010 A(3)=A(3)+Y
3020 POKER(3),6:POKER(3)-Y,0
3030 IFA(3)=>8141THEN9500
3040 GOTO350
4000 Y=INT(RND(1)*10)+1
4005 IFA(4)=7500THEN350
4010 A(4)=A(4)+Y
4020 POKER(4),7:POKER(4)-Y,0
4030 IFA(4)=>8141THEN9500
4040 GOTO350
5000 Y=INT(RND(1)*5)+1
5005 IFA(5)=7500THEN350
5010 A(5)=A(5)+Y
5020 POKER(5),8:POKER(5)-Y,0
```

Base Attack
by Steve Carr

Baud Walk



Data path

Britain's publishing companies are starting to get serious about database publishing — and that's got to be good news. The *Economist*, Pergamon, *The Guardian* all now have an involvement with electronic publishing.

Next year I predict at least two major developments from computer magazine publishing houses giving a wider choice of

services for baud walkers. Database Publishing, which publishes *Micro User* for BBC owners plans a magazine all about networking.

News International has already announced its TTNS (The Times Network for Schools) schools' network based on the public electronic mail and noticeboard service Telecom Gold and PSS.

Schools joining TTNS will be supplied with a starter pack — suitable for the BBC and Research Machines micros — consisting of a multiple baud-rate (1200/1200 half-duplex, 1200/75, 300/300, 1200/1200 pseudo-full duplex) auto-dial auto-answer modem, and the necessary software to access the network. Also supplied is a tutor program and operation

manual. The whole lot knocks out at a basic price of £182, though it is only available for schools.

With so many of the main publishing companies beginning to take such an active interest in electronic publishing, the UK Publishers' Association recently met to co-ordinate how best to make the information we get in print available on databases at a price people can afford.

One of their battle grounds will be with the Government, and presumably BT, in presenting the publishers' case to get the cost of data calls (as opposed to telephone calls) down.

Data paths can easily be monitored at exchanges and with BT experimenting with itemised billing, cheap data call

tariffs cannot be ruled out simply because of administration problems and the like.

The cost of modems has now come down to a sensible level, development in printing technologies are well advanced — and a cheap data rate would make good sense. After all, Prestel was invented to try and get people using the telephone more at off peak times.

Robin Wilkinson

Baud Walk is a new weekly column with news on networking, databases, reviews of modems and software and points of contact for information.

Any readers with experience of networking are asked to send their experiences or news of services to Robin Wilkinson, *Baud Walk Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

He can also be contacted on Prestel mailbox 019993727.

Choosing the right computer is a good start – but can you find the right software?



At SUPERSOFT we're very conscious of the fact that people who spend several hundred pounds on computer equipment are looking to do rather more than play Space Invaders.

Financial planning is a rather grand name for something you've been doing all your life – making ends meet! Perhaps if Mr Micawber had used **BASICALC** he would have been able to balance the books a little better.

For home, club or small business use **BASICALC 1** should pay for itself in no time at all; for larger companies we recommend **BASICALC 3**, one of the few really valuable programs that you can learn to use in a day.

Although your Commodore 64 is a powerful musical instrument you need to be a pretty good programmer to understand how it all works. Unless, of course, you buy **MUSIC MASTER!**

To use **MUSIC MASTER** requires no prior musical knowledge, though in the hands of an experienced musician it will prove an invaluable tool. You don't need to know the first thing about programming either! **MUSIC MASTER** is the musical equivalent of a word processor, remembering the notes you play and allowing you to replay and edit them as you wish.

INTERDICTOR PILOT is a space flight simulator. Nowadays simulators are widely used to train pilots and astronauts because – to be frank – it's a lot cheaper (and safer) than the real thing!

Imagine, if you will, life in the 22nd century: space travel is commonplace, and on the outskirts of the galaxy the first war between civilizations is being fought. A shortage of trained pilots has prompted the Federation to develop a computer simulation that allows raw recruits to gain experience without paying for their mistakes with their lives. With the aid of your Commodore 64 you too can learn to pilot the Interdictor Mk 3 craft. But be warned – this is no game!

SUPERSOFT

SUPERSOFT, Winchester House, Canning Road,
Wealdstone, Harrow, Middlesex HA3 7SJ
Telephone: 01-861 1166

Other SUPERSOFT products include the **MIKRO ASSEMBLER** cartridge, the only assembler that's ideal for beginners yet powerful enough for the professional (most of our competitors use it!). The **VICTREE** cartridge adds dozens of commands to Basic including toolkit aids and disk commands; or on disk there's **MASTER 64**, a really comprehensive package for the keen programmer.

Of course, we do also publish games programs, and with classics like **STIX**, **QUINX** and **KAMI-KAZE** in our range we are one of the market leaders. But we most enjoy coming up with the sort of programs that are going to be in use for months and years, not hours and days – the sort of programs that make you glad that you bought a computer – and glad that you bought SUPERSOFT!

You won't find SUPERSOFT products on the shelves of your local supermarket. But most specialist shops stock titles from our extensive range (and are prepared to obtain other programs to order). However you can also buy direct by sending a cheque (pre-paid orders are post free!), by calling at our offices, or over the telephone using your ACCESS card.

Tony Bridge's Adventure Corner



On a budget

About the only place that Dragons pose serious threat nowadays is in adventures! It's a pity that after a slow start, software for the Welsh computer was just beginning to get into its stride when the company collapsed. For us adventurers, there wasn't much to rave about — apart from pretty dire offerings from houses like Virgin Games, there was only *Pettigrew's Diary* from Shards Software, (recently translated to the Spectrum), the *Ring* epics, Wintersoft's not Wagner's, and the *Dan Diamond* Trilogy from Salamander. I noticed a letter in another magazine (which shall remain nameless) from Neil Scrimgeour, who has written to The Corner on occasion. He has started a national Dragon group with Paul Grade. Neil is running the Adventure section — best of luck with it, Neil. Write to Paul Grade at 6 Navarino Road, Worthing, Sussex, including a SAE.

The subject of budget games continues to vex computer users. Are they the ultimate deterrent against piracy, or merely dumping grounds for dud products by less than scrupulous software houses? The first assumption is, I believe, naive; even if games are awful and are for sold 20p there will still be more copies pirated than sold — after all, they will probably only be played once or twice before being consigned to a deep dark drawer. Good games, on the other hand, are eminently collectable, and, particularly if the package includes more than just the usual bare cassette with a bit of lame

fantasy scenario, the game will be bought in its thousands. Put yourself in the place of a 12-year-old with just a few pounds in his pocket — he can only afford one or two games at a time, and he will spend it on the ones which play well and look good and professional.

Unfortunately, some software houses feel that budget games equal inferior games, but not all. Mastertronic, in particular, are well-known for their cheap packages, but if the games I've seen from them are an indication of the whole range, then the quality is the equal of higher-priced products.

Now, several adventures join the ranks of Mastertronic software, with their new series, Master Adventurer. *Volcanic Dungeon* and *Black Crystal* will be well-known already, from the Carnell Software days. *Black Crystal* remains as it was, but at an incredible price of £2.99 for the six-part 180K adventure, which comes on two cassettes complete with booklet containing the first part of the "Third Continent" story. This story is continued in *Volcanic Dungeon*, also at £2.99, and which is basically the same program (one of my all-time favourites), with added graphics.

A new program, again at £2.99, is *Se-Kah of Assiah*, by Clive Wilson and Les Hogarth. This is a two-part, 96K, graphic adventure for the Spectrum and Commodore 64, and has kept me diverted for several days now. Starting in a village hard by a forbidding castle, the adventurer's task is to enter the Castle, search for (hence he is a Se-Kah, groan!) and recover the Three Great Artefacts of the Wise Ones (nothing is plain ordinary in Mastertronic's world), then escape and deposit them in final resting places. You'll find 170 locations, all depicted in nicely-drawn if blocky graphics — text input and program response is reasonably fast, and full sentence analysis is featured. One day, I'll discuss full sentence analysis in greater depth, but in passing, let me say that I often wonder just how useful this can be. I find the more prosaic two-word commands will cover most situations.

There are a couple of weird things going on with the text handler in *Se-Kah*. Type in 'WEST', for example, and the answer is 'That will get you nowhere', or 'West what?' — try 'W' and the desired effect is achieved.

However, *Se-Kah* is outstanding value —

it was originally intended to be marketed at £7.99, and it shows, with good graphics and generally good presentation. I can't think of any reason against rushing out to part with £2.99 in exchange for this great newcomer — if you do, take my advice, and search around the village at the very start.

A couple of weeks ago, I was talking about a program sent to me by Keith Wadhams. This was a Quill'd adventure for the Commodore, and Balsak the Bulbous, aka The Great Wizard, aka Ken Matthews looked at it for me and was impressed. He mentioned it to a well-respected software house, and now it seems that Keith's program will be released very soon.

Another Quill'd adventure comes from Compass Software. It is the first in a series, and is called *Project X. The Micro Man*. It concerns the exploits of a rather ham-fisted scientist who has managed to make himself smaller than an ant. Colour is used quite well, and each object has a little associated graphic. There are the obligatory grammar and spelling mistakes, and I find it a little strange that The Quill is not mentioned in the program. Most of the puzzles are straightforward, but the scene-setting is atmospheric, and the program is reasonable value at just £3.25, including p & p. Write to Compass at: 63 Cozens Road, Norwich NR1 1JP.

Now, let The Grand Elf and I say a very big 'thank you' to the many greetings and good wishes we receive from fellow-adventurers who just want to say: "Keep up the good work — more space for The Elf..."; it's nice to know that someone is on the other end of the Corner. We also get the occasional wing from you, though: "When are you going to review *Fred goes to the Laundrette*, it's FANTASTIC (and written by my brother)" or "When are you going give us some more tips, instead of all these boring reviews?" Well, both points of view are valid, so here are a couple of hints!

In *Golden Baton*, which seems to be the most popular Channel 8 adventure at the moment (or, at least, the one which is foxing most people):

To get past the Crabs, say *Feed Slugs* (you did *Get* and salt them, didn't you?) — for some reason, crabs hate the sight of salted slugs.

And for those of you stuck in the railway carriage at the very beginning of another Channel 8 adventure, *Ten Little Indians*, just: *Wait, Wait* and then *Go East*. Then *Go Down*, where you will find something interesting.

This series of articles is designed for novice and experienced Adventurers alike. Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter. So, if you have an Adventure you want reviewed, or if you are stuck in an Adventure and cannot progress any further write to: Tony Bridge, Adventure Corner, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

Adventure Helpline

Going bananas? If you are stuck in an Adventure with nowhere to turn do not despair — help is at hand.

Fill in the coupon, explaining your problem,

Adventure on (micro).....
 Problem
 Name
 Address

send it to us, and a fellow adventurer may be able to help.

Remember — the system only works if those adventurers who have solved the puzzles get in touch. Every week is Save An Adventurer Today (SAAT) week!

I LOVE YOU

little floppies - so these are just for you!

Full depth colour-coded sleeves
Ruled both sides for extensive
contents listing and complete with
matching index tabs.

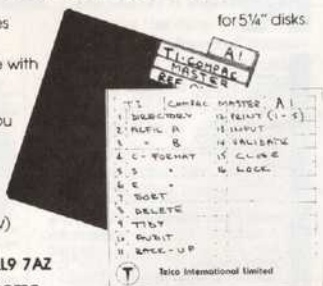
A complete filing and
identification system where you
need it - with your disks.

In packs of 10 sleeves and
tabs - £3.65 inc p+p
Specify colour

(red, green, blue or yellow)

TELCO INTERNATIONAL LTD.
Bulls Lane, Hatfield, Herts AL9 7AZ

Trade enquiries welcome.



SAVE . . . SAVE . . . SAVE

DISCOUNT COMPUTERS AND SOFTWARE

48k Spectrum..... £119.95
48k Oric Atmos £139.95

Prices include VAT & P.&P.

Discount Software for Atari ★ BBC ★ CBM 64 ★ VIC 20 ★

Spectrum ★ Oric 1 ★ Oric Atmos ★ Texas 99/44

For free lists send SAE stating machine type to:

RAMTOPS

47 Broom Lane, Levenshulme, M/C M19 2TX
or telephone 061 442 5603.

Christmas Bargains

QL £375, Spectrum £120, Spectrum+ £170, Atari 800 XL
£120, Atari 600 XL £95, Amstrad (phone), BBC B £380,
Electron £190, Goldstar MSX £220, Sanyo MBC-550 £725,
MBC-555 £940, CBM 64 £185, CBM 1541 Disk £210, CBM
Data Recorder £40.00, Sinclair Expansion Pack £95,
Microdrive/Interface £45, QL Monitor £260.

Printers: Riteman £250, Olivetti JP101 £200, Cannon JP
1080A.

Cheque/P.O. to:

AHMEDI INTERNATIONAL

Unit 1, 9 Winchester Street,
London W3 8PA

Phone for additional offers: 01-992 1362
Delivery 7-10 days subject to availability

GRAND XMAS SALE

Give yourself a REAL treat this Xmas with one of our TOP TEN
Bargains and make some FANTASTIC savings!!!

	RETAIL inc. vat	SALE PRICE inc. vat
(1) ACORN ELECTRON	£199.95	£179.95
(2) ACORN BBC MODEL B	£399.00	£379.00
(3) COMMODORE 64K	£199.95	£187.00
(4) COMMODORE 1541 DISK DRIVE	£229.00	£199.95
(5) SINCLAIR 48K SPECTRUM	£129.95	£119.95
(6) SINCLAIR SPECTRUM+	£179.95	£169.95
(7) SINCLAIR QL	£396.00	£379.00
(8) ROTRONICS WAFADRIVE FOR SPECTRUM	£129.95	£119.95
(9) RAM TURBO INTERFACE FOR SPECTRUM	£22.95	£19.95
(10) MICRODRIVE FOR SPECTRUM	£49.95	£45.95

There are MANY, MANY more bargains available. If you don't see what you want, then
ring for an instant quote. Send SAE for lists. Add £5 for delivery on items 1-8 and £1.50 for
items 9 and 10. All prices subject to availability. Please send cash/cheque with order.

SOUTH WALES SOFTWARE, DEPT PCW, FREEPOST,
CLYNDERWEN, DYFED SA66 7RU. Tel: 9947 457



DARK STAR



★ A CRASH SMASH ★

► DARK STAR - HAS TO SAY THE LEAST
STUNNINGLY FAST AND SMOOTH 3D VECTOR
GRAPHICS ■ IT MUST SURELY WIN THE
ACCOLADE AS THE FASTEST SPECTRUM
GRAPHICS EVER ■

HOME COMPUTING WEEKLY FIVE STAR RATING

★ ★ ★ ★ ★

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

PERSONAL COMPUTING GAMES ★ ★ PCG HIT ★ ★

► I FOUND IT EXCITING AND
COMPELLING AND KEPT WANTING TO
HAVE JUST ONE MORE GO ■

Design Design

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

DARK STAR

SUNARO

SPECTRUM	8.50	COMMODORE 64	9.75	AMSTRAD	5.25
GHOSTBUSTERS	8.75	GHOSTBUSTERS	8.75	FOREST WORLDS END	5.25
BATTLECRASH	8.75	SPACE SHUTTLE	8.75	MESSAGE ANDROMEDA	5.25
10 DAY	8.75	NATO COMMANDER	8.75	HOUSE OF USHER	6.25
TOWERS OF DESPAIR	6.75	FORT APOCALYPSE	8.75	MAINC MINER	7.50
BEACH HEAD	6.75	ZAKRON	8.75	STEVE DAVIS SNOOKER	6.95
REVER HAD	6.75	DREIBIS	8.75	FLIGHT PATH 737	6.95
JASPER	5.95	FLAK	8.75	TV LAMACHESS PACK	11.50
COMBAT LYNX	7.00	BEACH HEAD	8.75	ANY 8.95 AMSOFT	7.95
EUREKA	12.75	RAID OVER MOGDOV	8.75	ANY LEVEL 9	8.75
DELUXE MACHINA	12.75	SPIRITS AGE	8.75		
KNIGHT LORE	8.50	SNOKE	8.75	COMPUTERS	125.00
UNDERWORLD	8.50	EUREKA	13.25	SPECTRUM 40K	175.00
SCORPHER CLAYMORQUE	8.50	SELECT 1	10.95	SPECTRUM 48K	188.00
SELECT 1	10.95	FSS LIBRATOR	6.95	CBM 64	135.00
PIZZANNAUTO 1A PACK	11.25	FOOTBALL MANAGER	8.95	CBM 16 PACK	127.00
STEVE DAVIS SNOOKER	6.75	SURFIDE EXPRESS	8.95	ATARI 800X/64K	
LODE RUNNER	8.50	RYJANNAUTO 1A PACK	11.50	MICROSPEECH CBM SPEC	25.95
ANY 3 FIREBIRD SIL	7.00	ANY 3 FIREBIRD SIL	7.00	SPECTRUM RAM TURBO	19.95
				QUICKSHOT II	9.75
BBC	8.75	VIC-20	5.25		
CHARTBUSTERS	6.95	DOOO LAIR	5.25		
SON OF FLAGGER	5.25	FIELDS OF WILLY	5.25		
MINI OFFICE	13.25	HUNCHBACK	6.25		
ELITE	6.75	WINGA WALTER	5.25		
FSS LIBRATOR	6.75	LAS VAGAS	5.25		
ANY 3 FIREBIRD SIL	7.00	BOTH FIREBIRD SIL	4.75		

A Merry Christmas to all our Customers

AQUARIUS

HOME COMPUTER SYSTEM

All available Hardware. Vast range of software cartridges and cassettes. Books, etc.

DIGITAL OUTPUT OUTPACKS 1-5 £6.95 each
(£1 discount with this ad.)

Send s.a.e for our mail order catalogue

Processor Ltd

A.O.S House 1 Willow Parade Cranham Essex RM14 1DZ

EWTTRENDS TECHNOLOGY

ACCESSORIES (Inc. p.&p.)

D=Diskette C=Cartridge 1=tape

DISKETTES 5 1/4"	55/50	55/50	D5/D0
(per 10)			
NEWTTRENDS	£13.50	£16.00	£18.50
CONTROL DATA	—	16.50	19.60
BASF	—	16.50	19.60
3M	—	16.60	20.00
DYSAN	—	25.00	35.00

CASSETTES — NEWTTRENDS —	In plugs of 10	REEL TO REEL
C-10 £2.90		
C-15 3.00		C-10 £4.50

FAST LOADERS

DISKETTE LIBRARY CASE	
holds 10 diskettes	£2.80
LOCKABLE CASE	
40 Diskettes	18.50
80 Diskettes	22.50
RAM 1541 EXPRESS	549.95
ARROW	26.00
plus C-64 (c)	44.00

PROGRAMMING AIDS

"INSIDE QUOTES" Easy to use beginning programmers template w/ instruction sheet	£1.00
QUICK BROWN FOX program template	2.00
EASY SCRIPT program template	2.00
BASIC teach yourself! CBM Basic template	2.00
PROGRAMMERS AID CARTRIDGE template for the VIC-20	2.00

IEEE-488	59.00
VIZA CBM64 to PET	33.95
Centronics cable	20.75

SOFTWARE

	List	Our
	Price	Price
VIZAWRITE 64 (d)	£79.95	£69.95
VIZAWRITE 64 (c)	89.95	79.95
VIZASPELL 64 (c)	99.95	89.95
VIZAWRITE + VIZASPELL (d)	44.50	41.50
PRACTIFILE 64 (d or f)	44.50	41.50
PRACTIFILE 64 (d)	29.95	26.95
IPS programmable spreadsheet (c)	69.95	

BOOKS

BUILDING WITH LOGO ON THE COMMODORE 64	£3.95
ELECTRONIC MUSIC ON THE COMMODORE 64	6.95
BEGINNING MACHINE CODE ON THE COMMODORE 64	6.95
BUSINESS FORECASTING ON THE COMMODORE 64	6.95
THE WORKING COMMODORE 64	5.95
COMMODORE 64 MACHINE CODE MASTER	8.95
GRAPHIC ART FOR THE COMMODORE 64	5.95
COMMODORE 64 ADVENTURES	5.95
MATHEMATICS ON THE COMMODORE 64	5.95
BUSINESS APPLICATIONS FOR THE COMMODORE 64	5.95
ADVANCED PROGRAMMING TECHNIQUES ON THE COMMODORE 64	5.95

INTERFACES

STACK PRS202	£32.95
Centronics (f)	23.50
Centronics (d)	28.50

Dealer inquiries welcome — write for details
Please add 50p for orders under £20.00 (Europe add £1)
Make cheques and P.O.s to: **Newtrends Technology** please allow two weeks for delivery.
Export orders less 15% VAT

35, North Audley Street,
LONDON W1Y 1WG, Telex 24828 PROMOV.

VIC 20 CHARIOT RACE £6.95

FROM THE HORSES MOUTH

"It's all machine code and is one of the best original games I've seen on the Vic for ages. Charlton Heston eat your heart out!" Popular Computing Weekly.

A great game, that I would recommend anyone to buy. The Gerrard team of games testers voted three to one in favour of this being the best game they'd seen for the unexpanded Vic. What else can you say, buy it!" Commodore Horizon

"If every Vic game was as good as this, no work would ever get done at which Micro. Go and buy, beg or borrow a copy now." Which Micro.

GET IT NOW!

AVAILABLE FROM-

spectrum **Radio** **GRAMADA**

WOOLWORTH HMV Co-op Stores

AND ALL GOOD SOFTWARE STORES!

micro-antics
Littlehome, Hawthorne Lane,
Codsall, Wolverhampton,
W. Midlands. Tel:09074-5147



Reverse effect

A Garside of Flixton, Manchester, writes:

Q In Vol 3 No 35 a reader asked you for a *Poke* to obtain a zero line number in a program. The *Poke* that you mentioned was I think a little complicated. *Poke* 23756,0 sets the first line number to zero, and *Poke* 23756,1 reverses this effect. I also have a very handy routine that makes the listing of a Spectrum Basic program very hard (if not impossible), if you make the first line of your program.

POKE PEEK 23635-256-PEEK 23636,255.

Enter this as line 0. If you want to make doubly sure that your listings are safe, then type in the above line after having got into extended mode and typed *Caps Shift* and *7*. I hope that this information is of help to your readers.

A Not so much an answer, more a comment. The *Pokes* I gave in my reply work even if the Basic program is relocated in memory. Your method relies on the Basic program always starting in the same place (which of course it usually does).

Abbreviated words

Liz O'Brien of Madeley, Cheshire, writes:

Q When typing a Rem statement, I have several times used the keyword abbreviations inside the Rem, and when the program has been listed the keywords have been completely diffe-

rent from the ones I typed in. Is this normal on a Commodore 64 or is my machine faulty? Should I abbreviate words inside a Rem?

A Interesting effect this... reminds me of the story of the computer that learned to program itself. It would appear that you have stumbled across a minor hiccup in the CBM Basic interpreter, as the manual clearly states that any characters appearing in a Rem will be listed exactly as they are entered. It would not be true to say that the effect you describe is likely to cause any problems with the programs you write, but for clarity's sake, I would use full words and not the abbreviations.

Forth Rom for ZX81

Peter Donnet of Cambridge, writes:

Q I have heard that there is a Forth Rom for the ZX81, is this true and will it work with the 16K Rampack version?

Also, does it have any printer commands? From where can I obtain a copy, or more details?

A There is indeed a Forth Rom for the ZX81, produced by Skyware Software. It supports the 16K Ram version, and also the ZX printer. You can contact Skyware at 73 Curzon Road, Bournemouth BH1 4PW.

Speeded-up Basic

Sam Evans of Cardiff, writes:

Q I have a Commodore 64 which I am extremely pleased with. However, there is one thing that I would like to know, is there any way of speeding up Basic programs. I know that machine code is a lot faster but I have enough trouble with Basic and I think that machine code might well be beyond my capabilities.

A There are a number of ways of speeding up Basic programs; the most common method is to use a Basic compiler. This effectively translates your Basic program into ma-

chine code for you, so you get the benefits of machine code program speed without the pain and anguish of actually writing it.

One other method, which achieves a much lower return, but is quite worth using, is to set the screen colour to be the same as the Border colour. This can be done by *Poke* 53266, Peek (53265) AND 239. Doing this results in about a five per cent increase in speed. To reset the screen to normal, use *Poke* 53265, Peek (53265) OR 16.

Reading the keyboard

F Bartolo of Swindon, writes:

Q I have a number of questions concerning the Colour Genie, which I hope you can help me with. How do you disable Break? How can I turn off the keyboard? How can I read the keyboard, ie, detect what keys are being pressed?

A To disable Break you need to *Poke* 16396,123, to re-enable it you *Poke* 16396,201

If you disable the keyboard your programs will in fact run somewhat faster; disable the keyboard by *Poke* 16405,0. To re-enable the keyboard *Poke* 16405,1.

As far as reading the keyboard is concerned, location 16420 holds the ASCII value of the last key pressed. So by Peeking this location you will be able to detect key depression. One last point is that the function keys have the ASCII value 92-95 unshifted, and 124-127 shifted.

Atari information

D Skinner of Lowestoft, writes:

Q In your magazine, which I buy every week, you seldom have any information regarding Atari computers. Why is this? Do you have

some personal dislike for Atari?

What about some hints and tips for this machine.

A I've got nothing against Atari, I just don't get any letters from Atari owners (except this one). As to why I don't get letters from this group, I honestly do not know. Now for a bit of light relief... all Atari owners reading this, try this routine, you should get an interesting effect on your colour screen.

10 POKE 1536,141: POKE 1537,188: POKE 1538,2: POKE 2,0: POKE 3,6: POKE 9,2

Type the above in, and then press *Reset*... pretty, eh?

Similar statement

H Caan of Ruislip, Middlesex, writes:

Q I would like to know what the Vic 20 statement is that corresponds to the Spectrum's *Print At* command.

My friend has a Spectrum and he is always bragging about this feature which I don't have. I am sure that you must be able to do this on the Vic, but I don't know how.

A Unfortunately, there is no equivalent of the *Print At* command on the Vic. You can, however, achieve the effect you want by writing a subroutine to carry out the printing for you.

Print At, as you probably know, displays at a specified line and column position on the screen. If we say that the cursor is to be moved to position X,Y on the screen before printing, then to simulate *Print "tethered goat" AT 4,4*, you could use the following:

```
40 X = 4: Y = 4: GOSUB 2000:
PRINT "tethered goat"
2000 POKE 781,X: POKE 782,Y
2010 POKE 783,PEEK (783) AND 254
2020 SYS 65320: RETURN
```

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Phil Rogers and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke*, PCW, 12-13 Little Newport Street, London WC2R 3LD

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

GAMES SOFTWARE

FANTASTIC BINGO Prints Fun Calls as well as numbers. Board displayed at any stage of game. Complete with Bingo Cards. Spectrum only £3.70 inc. p&p. Altaire 19, Sledge Green, Berrow, Nr. Malvern WR13 6JW.

STARBOARD! DINGHY SAILING Race game for Spectrum 48K. £6.95. Sent by return from: P.A.P.A., New House, The Green, Priddy, Somerset, BA5 3BB.

XMAS SPECIALS

(Order Before 15 January)

Football Manager	Spec £5.50
Micro Olympics	Spec £4.80
Crucio Egg	Spec £5.50
Scrabble	Spec £14.00
Football Manager	CEM £6.20
Micro Olympics	CEM £4.50
Teen Kingdom Walk	CEM £7.20
Crucio Egg	CEM £5.80

Chaque's P.O.'s

Computer Computers UK Ltd
9, Martins Close, Blackwater,
Camberley, Surrey GU17 0AH

SOFTWARE BARGAINS!!

COMMODORE 64 ZX SPECTRUM

Ghostbusters	£8.50	Knigh/Lord	£7.50
Strip Poker	£7.25	Underwounds	£7.50
Bludo Lee	£7.50	Backpackers	£5.90
Beach Head	£7.50	D. Thompson	£5.90
Daley	£7.50	Eureka	£1.50
Rhompson	£5.50	Ad. Sea Willy	£4.50
30 Time Track	£4.50	Ghostbusters	£8.50
Eureka	£12.00	Kalotoni Will	£4.50
		Shedlock	£7.50

Send S.A.E. for full list (postpaid). State which mono (small order only). P.O. cheques for M.C.S. (U.K.) LTD. (Dept FOW), 24 Edward Road, London E17 6LU

ORIC/ATMOS

Buy your Oric Software from our comprehensive range of over 100 titles. Send stamp for price list to:

LES WILSON SOFTWARE (P)
100 Blenheim Walk, Corby NN18 9HB

MONSTERS. Arcade game for CBM 64, fantastic graphics and sound effects only £6.95. Available only from: Discus Software, Freeport, Windmill Hill, Brixham TQ5 9BR. Tel: 08045 55532.

X-CERT

THE MUCH TALKED ABOUT X-CERT SOFTWARE

The sauciest game ever released for the 48K Spectrum, is available now, but only by mail order. Written entirely in machine code the game consists of 4 waves of SHOCK, HORROR and SCANDAL, featuring the Ugliest to the most beautiful of girls in which you have to CENSORED.....also you must..... CENSORED.....all the time. For your copy "Gissa Kiss" (code name, Smut) discreetly packaged, send £5.00 to Titan Programs Ltd., 46 Market Place, Chappenharn, Wilts. SN15 3HU.

OVER 18's ONLY

XMAS OFFERS

Game	RRP	Price
BMX STUNTS	£7.90	£5.49
CAVELON II	£7.90	£5.49
QUARI	£7.90	£5.49
JS SPRITE ED.	£7.90	£5.25
Any 2 above	£15.80	£10.00
Any 3 above	£22.70	£14.00
Any 4 above	£31.60	£17.50
CBM64 RESET SWITCH		£3.00

All above for CBM64 only and inclusive of pp and VAT
J N Hutchinson, 337 Tamworth Rd., Long Eaton, Nottingham NG10 3LU

TANTALISING PARTY GAMES FOR ADULT SPECTRUM OWNERS

STRIP POKER 2-10 people
RISQUE 2-4 people
£6.95 each (inc p&p)

P R SOFTWARE
683 Wimborne Road, Bournemouth
Dorset BH9 2AT

PATTERING PEPE & El loco rabbits — finger freezing frustration for dragon owners. 100% m/c action from Redhill, The Software House Dragon support. Mail order £3.95 inc. from Redhill Software, 357 Mapperley Plains, Nottingham NG3 5RS

SOFTWARE AT SILLY PRICES FOR XMAS

For: CBM 64, Spectrum, Vic 20, BBC, Amstrad, Dragon. Unbelievable Reductions.
Send S.A.E. To: B.T.B. Software, 166, Buchanan Street, Glasgow.
FIRST 20 REPLIES RECEIVE FREE TAPE.

HAPPY Hippy game, for 48k Spectrum, better than page 3, more fun than Hector Nicol. Send £3 + SAE to B Goldie 211 Mull Peltersburn, Airdrie, Scotland ML68 DP.

THE PRISONER of the village

A new 100% M/C adventure for the 48K Spectrum over 120 locations, many with graphics. Can you free yourself from the people who hold you captive in the mysterious village.

"Recommended without reservation"
— KFM Radio Manchester
Only £5.50 (inc. P&P) Cheque/P.O.'s to: SPOOF SOFTWARE
58 Railway Rd, Urmsston, Manchester M31 1XT

LIBRA SOFTWARE

presents for Dragon 3264:
"Escape from Hell House" & "Invaders from space"
"Harry Goes Bananas" & "Missile Commander"
2 new cassettes with 2 games on each. hi-res colour and sound.

Mail order only C.H.P.O. to: £6.95 each cassette 4 Marlborough Close
SPECIAL OFFER — Clacton-on-Sea, Essex
BOTH FOR £11.95

SOFTWARE

HOME ACCOUNTS. Put your house in order! Comprehensive coverage of bank accounts, credit cards, HP, etc. Inbuilt accuracy check. Projects cash-flow for any period. Available for

CBM64, Vic20, BBC & Electron £8.45. Free details from Discus Software, Freeport, Windmill Hill, Brixham, TQ5 9BR. Tel: 080 45 55532.

ZX JOGGERS DIARY

An reviewed in Rating magazine JOGGERS DIARY provides the dedicated jogger or athlete with comprehensive databases and analysis facilities.
* 1000 performance entries and 30 routes/events plus 3 years details on one data file
* performance summaries and graphs by route for overall stats, time per mile, pulse rate etc.
* superimposed performance graphs for comparison
* variable Y axis limits with automatic scaling
* weekly mileage issued or graphed highlighting weeks below any specified level
* all analyses can be output to printer
* sample database included
All this and more — a must for every jogger or athlete with access to a 48K Spectrum
Send Cheque/P.O. to: £5.50 to JOGGERS DIARY, 34 Green End St., Aston Clinton, Bucks.

COMMODORE C16

Sound and colour software for the C16 PONTON. Play the C16 at Ponton. FOOTBALL LEAGUE TEAM. Manage your own team to the top!

SYNTH 1. Programs the keys to play notes and sound effects etc.
£3.95 inc. £9.99 FOR ALL 3!
D. SPENCER SOFTWARE, Dept R, 50 Cranwick Ct., Billingham TS23

SECOND OPINION complex decision maker £5. Cosmic Influence Analyser £5. Tunewriter (for the non-musician) £5. Or send £1 for list of unusual programs for the SPECTRUM, C.C.S., 13 Walton Crescent, Llandudno Junction, Gwynedd.

ACCESSORIES

DISCO SCREEN
48K SPECTRUM
ADD A NEW DIMENSION TO your MUSIC and MICRO. A totally NEW EXPERIENCE. Actually LISTENS to your MUSIC, and REACTS to it. Watch as it takes up the MICRO of the MUSIC, and Produces FABULOUS, FASCINATING EFFECTS on screen. DISCO version is IDEAL for parties or to amaze your friends. RELAX version provides SUPER background as you enjoy quieter moments.
CASSETTE — £12.95
ASH BYPRODUCTS, P.O. BOX 519 BIRMINGHAM B178Z.

CLASSIFIED ADVERTISING RATES:

Line by line: 25p per word, minimum 20 words.

Semi-display: £6 per single column centimetre, minimum length 2 cm. (Please supply A/W as PMT. Or supply rough setting instructions.)

Conditions: All copy for Classified section must be pre-paid. Copy date 7 days before publication.

If you wish to discuss your ad, PLEASE RING Diane Davis 01-437 4343.

Here's my classified ad.

(Please write your copy in capital letters on the lines below.)

Please continue on a separate sheet of paper

I make this words, at per word so I owe you £

Name

Address

Telephone

Please cut out and send this form to: Classified Department, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

GENUINE BRAND NEW
ZX SPECTRUM
**POWER
SUPPLIES**
ONLY £4.95
incl. VAT & P&P



FLIGHT DECK JOYSTICK
for SPECTRUM
AT LAST —

a joystick that needs NO interface

ONLY
£5.95
incl. VAT P&P

Close directly onto Spectrum and gives complete operational control leaving hands free for other commands.

Don't be confused by pressing buttons any longer use the only joystick that gives realistic sensation to flying — at a realistic price!



- Directly operates cursor keys S, B, & B
- Operates all cursor keys software for left/right, up/down movement.
- Ideal for graphics plotting & drawing.
- No electronics, wiring or modifications.
- List of at least 50 games using cursor keys supplied with each joystick.

Please send me —
E.E.C. Ltd., Lincolnshire Close,
Charnock St., Warr, Salford, Salford
NAME _____
ADDRESS _____
POSTCODE _____

BANISH LOADING PROBLEMS



We are now the exclusive dealer of the ELINCA Tape-loader. Carefully selected from the best.

It is now available for the following computers — Spectrum, ZX 81, Orp-1, Atmos, BBC, Electron, Dragon & Atom, and still only

£14.99 Inclusive Post Free
£12.00 Inclusive Post Free

CELINA Software
Business Help Series for the SPECTRUM. FILECAB. The only program you will ever need for that file job.

STOCK. Keeps tabs on all your stock, with a running total of cash value of all stocks. Add and remove stock at will. £15.99 incl.

PROFIT. Ever wondered how to calculate the selling price of an item, this program does just that taking into account your overheads and how much profit you want to make. £15.00 incl.

For details send S.A.E. to —
CELINA LTD.
Daisy Walk, Sheffield S3 7PY, England.
Tel: 756728 (STD 0742)

MONITOR QUALITY PICTURE

Simply plug the Monitor 3 between your computer and any television for a sharper, wider picture.
Only £29.95 incl. P&P
Allow 28 days for delivery.
Send cheque/PO payable to
Solar Computer Products
P.O. Box 4, Monmouth, Gwent NP5 4YZ.
Tel: 0600 850601

ALL YOUR CASSETTE NEEDS

Blank cassettes C15 with case 40p
Labels in Blue, White or Yellow, 20 for 36p. Inlay cards in Blue, Yellow, Red, Green, Orange or Purple, 20 for 60p. Library cases 12p each. Postage on each complete order 60p.
Stonehorn Ltd., 59 Mayfield Way, Barwell, Leicester LE9 8BL

JOYSTICKS FOR QL

Plugs straight into control port 1 or 2. NO INTERFACE REQUIRED. £7.99 each or 2 for £15.00. Add 50p p&P.
COMPUTER SUPPLIES,
146, CHURCH RD, BOSTON, Lincs. PE21 0JX

Self Adhesive Cassette & Disk Labels

CASSETTE LABELS — On A4 sheets, 12 labels per sheet, 100 labels — C3.50, 1000 — £21.85
Rolls of 500 labels on tractor feed backing paper for overprinting by computer printer.
White — £14.85, Tints available — Blue, Yellow, Pink, Green, Orange or Grey — £16.50
DISK LABELS — Rolls of 500 labels on tractor feed paper; White — £12.75, Tinted — £15.00

The above prices are VAT & carriage inclusive. For our full price list and sample brochure Telephone (0798) 29425 (24 hrs.)

INDUSTRIAL PROCESS
Self Adhesive Labels — SUPERFAST
Unit A4, Smead Drive Centre, Barclink Way, Slingsbourne, Kent ME10 3RN

DISK USERS

CDS D/S D/D £13.80 for 10 blank disks (mk1 leaders) £15 for 10
Datatype S/S D/D £16 for 10
Dysan D/S D/D £24.80 for 10
Scratched disk can be regained with "Get-it-back" — only £8.99
All items 70p P&P

LOST IN FOUND SOFTWARE
Box No. (PCW5) Classified Dept., Popular Computing, 12-13, Little Newport St., London WC2R 3LD.

NO FUSS LOADING

with the
LOADMASTER
when loading in future the built-in meter will give you a correct setting EVERY time.

Just plug between recorder and computer. Price inc. P&P £11.49
Problemasol Ltd., 23 The Ridgeway, Cuffley, Potters Bar, Herts EN6 4BB

DISK BOXES

70 disks, beautiful flipover smoked lid — £13.99
90 disks, Locking box — £17.99
Immediate delivery to:

APERE
67 Church Rd., London NW4

BLANK CASSETTES

10 C10's for £3.65; 100 for £25.00
10 C25's for £3.65; 100 for £26.00
10 C20's for £4.00; 100 for £27.00
FULLY GUARANTEED. Inc. P&P
C.O.D. add 65p. Immediate Dispatch.

U.K. HOME COMPUTERS
82, Churchward Ave, Swindon, Wilt.
24 HR Order Phone 0793-656304

BLANK CASSETTES

C10 £2.95 FOR 10, £22 FOR 100
C15 £3.05 FOR 10, £22 FOR 100 inc. p+p
FULLY GUARANTEED
Send cheque/PO to:
G.R.P., 369 Mile End Road, London E3 4QS. Tel: 01-980 1186
ACCESS ORDERS BY PHONE

UTILITIES

TEXAS EXTENDED BASIC:

Our new range of extended Basic programs is now available.

Please send S.A.E. for further details

We also have programs for Memotech and Aquarius.
SOLWAY SOFTWARE,
6, CURZON ST., MARYPORT, CUMBRIA
CA15 6LL

WD Software
QL Utilities (£10 on Microdrive)

This package offers single-key loading, running or deletion of files, multiple formatting of cartridges, and auto backup of files from one or more cartridges to another with optional over-writing of namesakes. In addition, a directory of 60+ files can be viewed without screen overflow. NB a VERIFY program is unnecessary — QDOS does this automatically. Now includes directory print-out and "spint" to print any or all files on a cartridge with optional dated lists. Owners of the earlier package can update by sending OUR cartridges and 25p.

CURRENT SPECTRUM PROGRAMS
Tradedwin (£5 Cassette)

Buy a ship, provisions and cargoes to trade between the harbours of the Coral Islands. Make a fortune if the weather and pirates let you live long enough to master seamanship and economics. A strategy/adventure game with graphics for 48K.

Jersey Quest (£5 Cassette)

Following an accident, you are stranded in the labyrinth of time and must find your own way back to the Present with the aid of persons and objects from Jersey Folk, Meet the Black Horse of St Owen, the Dragon and Knight of La Hougue Bie, the Black Cat of Carrefour a Centre, the Witches of Rocqueburg and many others. A text-only adventure for 48K in machine code (Quill).

Morse Tutor (£4 Cassette, £8.50 Microdrive)

4-19 words/minute, variable spacing number of groups of random letters, numbers or mixed, random sentences, own message, single characters (including punctuation), variable pitch, FEEDBACK via screen, printer of SPEECH (phonetic alphabet via Carrah u-Speech on 48K version. 16K and 48K versions on one cassette, 48K only on Microdrive cartridge.

Spectrum Programs on Microdrive

All the above are available on Microdrive cartridges at a price of £4.50 for one cartridge & the price of each program as shown above. E.g., a cartridge with Tradedwin and Morse Tutor would be £13.50. As a BONUS, Gavin Monk's Indexed Loader is included FREE with each cartridge.

20 Portmeadow Walk London SE2

ARROW MICRO SERVICES

ARROW TURBO-SAYER
- Commodore 64 -

Feed up with waiting for those programs to load? You need Turbo-Sayer, easy to use and faster than the 1541 disk drive. Programs reload independently. £7.00

ARROW DISCOPY
This reliable disk copier will copy both PFG and SEQ files faster than 1541 back-up and you don't need to copy all the disk, very user friendly and easy to use. £7.00

ARROW TRANSFER
Transfer your favourite games to disk both multi part and Auto Runs, works with most software. £7.00

ARROW DISK-DOCTOR
Now you can recover scratched files easily, edit any byte on any block in Hex or Alpha, alter programs, edit the directory. £9.00

CHRISTMAS PERIOD OFFER

ZX Spectrum, Maestro-ASM and Ultimon. The best editor/ assembler and monitor package around. £6.95 each, £12.50 the two. Amstrad CPC464 Maestro-ASM. Full feature editor/assembler. Only £6.95.

MICROHOLICS ANONYMOUS
Lord Nelson House, 21 High Street, Yarm
Cleveland TS15 9BW
0642-787389
0642-785825

1 Rowan Place, Dundee, Scotland DD9 9P. Tel: 0382 88232

SOFTWARES

Send cheques/PO's to:
£3.50 inc. p.p.

Faded/scratched Sprites and Sprites printouts included in the price

(Sprites Printouts Approved)

NOW AVAILABLE

LESET WILLY EDITOR MK II

MICRODRIVE ONE (MD1)

AT LAST 48k Spectrum owners with MD1 drives, discs, etc. can now transfer the MAJORITY of their tape programs (line headerless, 48k programs those with LOW addresses — any 16384) and get them running.

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

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

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

OVERSEAS: £1 Europe, £2 others for each product. SEND SAE for enquiries. ALL WITH MONEY BACK GUARANTEE.
LERN, DEPT WE1
10 Brunswick Gardens
Corby, Northants

O.A.

X10 DATA THRUSTOR

THE DISC DRIVE ALTERNATIVE

Who needs disc drive when you can now genuinely load your programmes at 10 times normal speed.

Designed for your Commodore DATA THRUSTOR converts virtually all software to an advanced 'TURBO' type loading. Easy to use, with full inst. £7.95 inc.

XR64

INVESTED IN A DISC DRIVE?

Then you will need the XR64 to convert your tape based software onto disc. Exceptionally easy to use, transfers most (normal speed) software to disc. Supplied on tape £7.95 inc.

verbal SPEECH SYNTHESIZER

An amazing microspeech programme for the Commodore 64. It is so easy to use, load and command your 64 to say anything you can also write it into your basic programme. No hardware required. Supplied on tape £6.95 inc.

Send P.O. Cheque to 38 High Street, Barbury XR Consultants OXON OX16 8ET

COMMODORE 64 - VIC 20

Specialty designed UTILITIES giving those extra facilities that prove so USEFUL, TIME and TIME again.

BYTREC BACK

Commodore 64/Vic20
So USEFUL you will wonder how you ever managed without it.

(i) TOTAL PROGRAM CONTROL and CRASH PROTECTION. A simple to use RESET device giving TOTAL control over all programs. RE-ENABLES computer functions, RUN/STOP RESTORE, etc. RESTORES BASIC. Code Program after reset or crash, without program just plugs into your micro, no mods needed.
(ii) A major M.C. repair routine, which can EVEN RE-LOAD AFTER a disaster, and still totally recover the program.
(iii) A match code AUTOFIND utility, which can easily in understandable form, IDEAL for MODIFYING or writing programs without fear, even if they crash, you can reclaim them.
(iv) Machine Code DISASSEMBLER, helps take the mystery out of M.Code. See how your favourite Programs work.
CASSETTE — £6.95/DISK — £9.95

SUPERKIT 64

COMMODORE 64 ONLY
Gives you those EXTRA FACILITIES to assist your programming. A SUPER TOOLKIT of microcode routines - Complete RE-NUMBER (incl. GOTO-GOSUB) AUTO LINE TRACE/FIND AUTO RUN/BLOCK DELETE.M. Code MEMORY SAVE and more. Software Control of flexibility and at a reasonable price. CASSETTE — £6.95/DISK — £9.95. Both programs give almost all the EXTRA UTILITIES for writing/modifying programs.

(iii) A match code AUTOFIND utility, which can easily in understandable form, IDEAL for MODIFYING or writing programs without fear, even if they crash, you can reclaim them.
(iv) Machine Code DISASSEMBLER, helps take the mystery out of M.Code. See how your favourite Programs work.
CASSETTE — £6.95/DISK — £9.95

REKORDAKIT 64

COMMODORE 64 ONLY
HEAR your Datasette Performing. Keep C2N in Top condition. Simple to use plug-in device TEST/INFORMATION TAPE to ensure tape heads are correctly set. £6.95.
REMEMBER gate Computer. Cheaper. U. to ASH BYPRODUCTS. P.O. Box 610 BIRMINGHAM B78ES.

REKORDAKIT 64

COMMODORE 64 ONLY
HEAR your Datasette Performing. Keep C2N in Top condition. Simple to use plug-in device TEST/INFORMATION TAPE to ensure tape heads are correctly set. £6.95.
REMEMBER gate Computer. Cheaper. U. to ASH BYPRODUCTS. P.O. Box 610 BIRMINGHAM B78ES.

REKORDAKIT 64

COMMODORE 64 ONLY
HEAR your Datasette Performing. Keep C2N in Top condition. Simple to use plug-in device TEST/INFORMATION TAPE to ensure tape heads are correctly set. £6.95.
REMEMBER gate Computer. Cheaper. U. to ASH BYPRODUCTS. P.O. Box 610 BIRMINGHAM B78ES.

REKORDAKIT 64

COMMODORE 64 ONLY
HEAR your Datasette Performing. Keep C2N in Top condition. Simple to use plug-in device TEST/INFORMATION TAPE to ensure tape heads are correctly set. £6.95.
REMEMBER gate Computer. Cheaper. U. to ASH BYPRODUCTS. P.O. Box 610 BIRMINGHAM B78ES.

REKORDAKIT 64

COMMODORE 64 ONLY
HEAR your Datasette Performing. Keep C2N in Top condition. Simple to use plug-in device TEST/INFORMATION TAPE to ensure tape heads are correctly set. £6.95.
REMEMBER gate Computer. Cheaper. U. to ASH BYPRODUCTS. P.O. Box 610 BIRMINGHAM B78ES.

REKORDAKIT 64

COMMODORE 64 ONLY
HEAR your Datasette Performing. Keep C2N in Top condition. Simple to use plug-in device TEST/INFORMATION TAPE to ensure tape heads are correctly set. £6.95.
REMEMBER gate Computer. Cheaper. U. to ASH BYPRODUCTS. P.O. Box 610 BIRMINGHAM B78ES.

REKORDAKIT 64

COMMODORE 64 ONLY
HEAR your Datasette Performing. Keep C2N in Top condition. Simple to use plug-in device TEST/INFORMATION TAPE to ensure tape heads are correctly set. £6.95.
REMEMBER gate Computer. Cheaper. U. to ASH BYPRODUCTS. P.O. Box 610 BIRMINGHAM B78ES.

REKORDAKIT 64

COMMODORE 64 ONLY
HEAR your Datasette Performing. Keep C2N in Top condition. Simple to use plug-in device TEST/INFORMATION TAPE to ensure tape heads are correctly set. £6.95.
REMEMBER gate Computer. Cheaper. U. to ASH BYPRODUCTS. P.O. Box 610 BIRMINGHAM B78ES.

Friendly Face

Microdrive Utility

Add these menu-driven loop routines to your programs for quick and easy cartridge file management. Self-deleting "hot" routines to load or erase any program on cartridge.

Separate routines, ready to merge with MASTERFILE and TASMORO TMO, for trouble-free, daily professional use with Microdrives or cassette backup, including erase and catalog loop subroutines. Including over 10K of Basic routines, and 5000 word instruction manual.

NEW Masterfile ACTION and MEMO formats, free with cartridge version.
MEMO is a free-form, notepad format for ordered, referenced notes.

Cassette £125, Cartridge £125 incl. VAT. Order NOW to Monitor Ltd. Box 642, Mill Hill, London NW7 2JF. Write or call 01-950-1181 for leaflet.

DUPLICATION

HIGH-SPEED CASSETTE DUPLICATION

- Full-colour laminated inlay cards
- Cassette labels
- Artwork
- Blank cassettes

A comprehensive range of professional services at probably the lowest prices in the U.K.
High-speed loading of programs at up to 10 times the normal speed available for some computers at no extra charge.
Write or telephone for full details.

LOGICOPY

GOLDSTAR HOUSE
198/200 QUEENSWOOD DRIVE,
LEEDS LS6 3ND
Tel. for details: 0532 788758

DATA DUPLICATION M.G. COPIES

Burnthorpe, Walsall, West Midlands.
0543-408687 or 0543-75375 (24hrs)
Data duplication, quality cassettes, printing, distribution to customers with competitive prices and fast turn around.
Price lists and samples on request.

Dear Reader, my name is Simon Stable and I specialise in real-time data duplication for BBC 4080 (professional available). Disk matrix printed inlays blank. Blank cassettes.

FAST TURNAROUND 0869 252831 COMPETITIVE PRICES P.I. FREEPOST: 48 WESTON, LANUNTON, EXON OAS 812

"DATATAPES" for highest quality blanks and data duplication, call now for a sample quote. You will find us VERY competitive. The Midland Railway Grain Warehouse, No 2, Derby St. Burton Upon Trent, Staffs. (0263) 38199.

EXHIBITIONS

MICRO COMPUTER EXHIBITION

SAT. JAN. 12th 1985

THE GREAT HALL,
CIVIC CENTRE,
BROMLEY, KENT
INFO: EAST-WEST
TEL: 01-290 5299
THE NEWSPAPER FILES

ALL YOU NEED TO KNOW ABOUT THE NEWSPAPER £2.50. PUBLISHED JANUARY '85
VITAGRAPH LTD, 26 COLLEGE ROAD
BROMLEY, KENT BR1 3PE

FOR HIRE

TO HIRE a computer from Spectrum 48K upwards, please phone or write to Business & Computer Services, 294a Caledonian Road, London N1 1BA. Tel: 01-607 0157.

SERVICES

The M64 for SPECTRUM users

by MANCOMP LTD.

Designed by Programmers and Repair Specialists for Simplicity, Speed, Safety & Space



WHY DO SPECTRUM USERS FROM LONDON, DEVON, ESSEX & CAMBRIDGE SEND THEIR MICROS TO US FOR REPAIR?

- Only Co. in all U.K. offering while-you-wait service.
- or 24 hour turnaround every micro insured for return journey.
- phone or send for free estimates inc. £1.00 U.K., I.O.M., Eire, C.I.
- No hidden handling charges.
- Special rates for school. • Please phone for appt.

MANCOMP LTD. (dept. PCW)

Printworks Lane, Lovellsurme, Manchester M19 3JF. Tel: 061 224 1888

ENGINEERS!!
MANCOMP URGENTLY NEEDS MORE STAFF
(WRITE OR PHONE)

SPECTRUM REPAIRS

We expertly repair Spectrums for £15 inclusive of parts, labour and return postage. Spectrums upgraded to 48K for £28 including post.
R.A. ELECTRONICS, 50 Kimberley Road, Lowestoft, Suffolk.
Tel: (0502) 66289

REPAIRS — ZX81 — Spectrum. Fast, reliable repairs by experienced engineers, having serviced Sinclair computers since the introduction of the ZX80. Our price is inclusive of all parts, labour, postage and VAT irrespective of fault. * No hidden charges. * While-you-wait service available. Spectrum £18.75, ZX81 £11.50, 16K Ram £9.95. Call or SEND WITH CHEQUE OR P.O. to: TV SERVICES OF CAMBRIDGE LTD, French's Road, Cambridge, CB4 3NP. Tel: (0223) 311371.

BBC SPECTRUM REPAIRS

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

SUREDATA (PCW)
Computer Service
45 Wychwood Avenue, Edgware, Middx.
Tel: 01-951 0124

HEMEL COMPUTER CENTRE LTD.

For fast reliable repair service, send your 16/48K Spectrum computer to us.
We will repair and return for £20 + £1.60 p&p.
ALSO BBC, Commodore, Atari and Dragon service
Hemel Computer Centre Ltd.
52, High St,
Hemel Hempstead,
Herts.
HP1 3AF
Tel: 0442 212436

COMMODORE REPAIRS. By Commodore approved engineers. Vic 20 Modulators £6.50, Vic 20 from £14.50, CBM64 from £18.00, C2N from £7.00, printers, disc, etc. for more details write or tel: G. C. Bunce & Son, 36 Burlington Road, Burnham, Bucks. SL1-7BQ. Tel: (06286) 61696.

SINCLAIR COMPUTER REPAIRS

SPECTRUM £14.50
ZX81 £11.00
ZX PRINTER £12.00
Inc. parts, p+p, and return insurance. Spectrums upgraded to 48K for £24. Fast turnaround — we like to take care of your computer — please pack carefully — and send with cheque or P.O. to: I.T. (WESTERN) ELECTRONICS, 97 Newtown, Trowbridge, Wilt. BA14 0BB

SPECTRUMS, DRAGONS AND COMMODORES

Expertly repaired and thoroughly overhauled by professional computer engineers using only top grade components. Manufacturers recommended modifications are fitted and all Spectrums are fully guaranteed for six months. Spectrums £20.00 total.

Dragons and CBM Free Estimates
MP ELECTRONICS
The Laurels,
Wending, Dereham, Norfolk.
Tel: 0362 87327

SPECTRUM repairs with guarantees.

— Send Spectrum, your name, address, and Tel. No., and description of fault. Dependable T.V. Service
9, Cryws Rd, Cardiff.
Tel: 0222484 006

SPECTRUM repairs by fully qualified electronic engineers, £12.00 including p and p, insurance, etc. Fast and reliable service. S. Yarwood, 24, Swinside Road, Bolton BL2 5NG. Tel: 061-652 2165.

Service and Repairs SPECTRUM, BBC, COMMODORE

MAIL ORDER OR CALL IN
Huge selection of software and full range of accessories.
Enfield Communications,
135, High Street,
Ponders End, Enfield, Middx.
TEL: 01-805 7772

SPECTRUM repairs £12.50 all inclusive, fast efficient 24 hr service, M.P. Electronics, The Laurels, Wending, Dereham, Norfolk. (0362) 87327.

AMSTRAD

AMSTRAD CPC464

ARNOLD BLACKWOOD — ADVENTURER EXTRAORDINAIRE
THE TRIAL OF ARNOLD BLACKWOOD A very worthwhile addition to the *Adventure!* library
CPC464 USER, Oct '84
ARNOLD GOES TO SOMEWHERE ELSE! A healthy sense of the ridiculous... Plenty of fun...
PCN Oct. '84

EACH ADVENTURE £6.50 inc. By Return Post. CDePOs to
NEMESIS, 10 Carlow Road, Ringstead, Kettering, Northants NN14 4DW.
Tel: (0933) 628987

THE HOLY GRAIL

A serious adventure game for Amstrad, CPC 466, BBC 32K, Spectrum 48K.
£5.00

Also: Pontoon, Dating Game, Quizmaster, Maths. I, Maths. II.

£4.00 each, £6.00 for two of these:

S.A.E. and cheque to:
TERRYSOFT, 29 Woodbridge Road, Barking, Essex IG11 9ER

AMSTRAD SOFTWARE

CHess, ROLAND IN CAVE, HAR-
RIER ATTACK, CUBIT, ROLAND
IN TIME, CRAZY GOLF, PUNCHY,
ELECTRIC FREDDY, GEMS
STRADUS, ALIEN, BREAKIN,
SULTANS MAZE, GP DRIVER,
LAZER WARP, HUNTER KILLER,
SPANNER MAN.

ONLY £7.90 EACH

GUIDE TO BASIC 1 £15.90 SPREAD-
SHEET £15.00 WORD-PROCESSING 18.00
HOME BUDGET £15.00 DEVPAC ASSEMBLER

AMSTRAD JOYSTICK ONLY £3.95

P&P PLEASE ADD 25p PER ORDER

COs/POs TO M.C. SUPPLIES

SCOTIA, LONDON ROAD, HITCHIN

HERTS SG4 9EN

AMSTRAD SOFTWARE

All £8.95 titles only £7.00 incl!
Snooker £6.45, Blogger £6.45, Devpac
Assembler £20.00, Combat £9.50,
Over 80 titles in our list!
Coastalsoft, 17 Pembroke Gardens,
Haitland-on-Sea, Essex CO15 5XD

SOFTWARE FOR AMSTRAD CPC 464 VALUE FOR MONEY=CAMEL

The equation you'll grow to like!
The amazing GRASP graph and function
plotter. Even better than the 5-star
Spectrum version. Watch out for a great review
in your official Amstrad User Club mag.
Price £9.50 in. p.p.
NUMBER 11: Previously economic simu-
lation games have tended to be dull. Not
this one! Great sound and graphics, bal-
ance for re-election with a chance for a coalition
if you don't earn an overall majority,
and grab a knighthood if you can. Out-
standing value at £5.50 inc. p.p.
TOOLBOX: You'll never find better than
this for utilities. Contains Graphics and
Sprites creator (usable in your own pro-
grams), cassette backup utility with high-
speed options, and a M/C monitor pro-
gram. All for just £4.95.
FLEXIFREND: A new home budgeting
program. You can use up to 35 accounts
will handle bank and cash payments.
£7.50.

Cheques/P.O.s £10-

CAMEL MICROS, WELLPARK,
WILLEYS AVE., EXETER
Existing customers—note new address!

AMSTRAD

THE TOMB OF KUSLAK

Graphic strategic adventure. 225 locations, 5
levels. Fight goblins, get use, and drop objects.
Reveal 4 treasures. Variable difficulty, different
set-up each game.

£3.00

D MUR, 78 Peverell Park Rd., Plymouth.

Tel: Ply 285 142

MODEM III NOW COMPATI-
BLE WITH AMSTRAD
GREEN SCREEN MODEL
FOR USE WITH COLOUR
TV.

SEE ACCESSORIES.

MAGAZINES



DRAGON USER

To make the most of your Dragon you
need *Dragon User* — the independent
magazine for Dragon owners. To make
sure that you receive a copy of *Dragon
User* regularly subscribe direct to us. A
year's subscription costs £10 for 12
issues (overseas rates available on applica-
tion). Send a cheque or postal order
made payable to Dragon user, and
accompanied by your name and address,
to Dragon User, Subscription Depart-
ment, Oakfield House, Perrymount Road,
Haywards Heath, Sussex RH16 3DH.

EDUCATIONAL SOFTWARE

THE MATHEMATICS PROGRAM SINCLAIR SPECTRUM OR ZX81

Put your computer to some use, don't play
games forever! Maths can be fun with the
computer as your teacher.
Six programs in one for
£3.95 (inc. p.p.).
Basic arithmetic, algebraic equations, py-
thagoras, trigonometry, fractions. Peren-
tagas. Written by graduate mathematics
teacher.
Cheques/P.O.s to:
D. Thomas, 'Corner Cottage', 19, Castle
St., Ludgershall, Nr. Andover, Hampshire

YOUR SCIENCE AND CHEMISTRY

Wavestoft's range of scientific educational software is
unique any other — based firmly on school require-
ments, it uses magnificent graphics and novel ideas.
Featuring this week:

Chemical Changes

(48k. only)

A package which shows atoms and molecules of ele-
ments, compounds and mixtures, together with fasci-
nating animations of important chemical reactions. A
must for 12-15 year olds studying chemistry!

£6.95 each from WAVESTOFT

22, Lodge Drive, Moulton,

Northwich, Cheshire. CW9 8HQ

Send for our catalogue!

A NEW CONCEPT in Educational soft-
ware. Histech-64 for Commodore 64.
An introduction to History for children of
any age. Numerous features including
Humour, Animation, Colourful Graph-
ics, Poetry, progress Reports etc.
£8.50 from: Megatron Software, 22
Mountfield Gardens, Kenton,
Newcastle upon Tyne NE3 3DB.

CBM PRINTER MP801 + paper
£169. Tel: Bromsbarrow 375, eves.
(Deliver Glous, or Coventry).

CBM S/W Many games all originals, inc.
Sub logic, Flight Simulator, Jumpman
etc. Phone for details 0903 763397.

CBM S/W all original, Pipe line, Tales of
Arabian Nights, Son of Blogger, £3.00.

DEVA

Educational Software from
Experienced Teachers
for 48K Spectrum

CARING FOR YOUR TEETH. Highly enter-
taining and instructive! Tooth structure and
function, and prevention of decay, with
multiple-choice quiz.
Age range: 8-14 years. £5.50

REALM. Nine Centuries of Monarchy: A
colourful and musical guide with length of
reigns, matching, royal quizzes. Age range:
6-13 years. £4.50

LOCK-KEEPER. Ever watch a car lock?
Well, this program shows you how, then offers
6 different tests just to make sure you can't
Encourage reasoning and ordering skills.
Age range: 10+. £5.50

Please make cheque/PO payable to:
DEVA EDUCATIONAL SOFTWARE,
33, Upton Drive, Chester. CH2 1BY.

QL SOFTWARE

QL DRAW

CURSOR/JOYSTICK CONTROLLED
TEXT AND GRAPHICS DESIGNER.
SAVE, LOAD AND HI-RES PRINT OUT.
MENU DRIVEN. EXAMPLE SCREENS.
£8.00. FOR IMMEDIATE DISPATCH
CHEQUES/P.O.T.O.:

GT SOFTWARE,

77 WARWICK ROAD,

MILTON KEYNES, MK3 6AT

Q.L. Utilities only £3.50. Eight utilities
available on microdrive cartridge for
£8.50 or send your own cartridge and
£3.50 to C.M. Richardson 32 Abbeydale
Oval, Hawksworth Park, Leeds, LS5
3RF.

COURSES

* COMPUTER COURSES *

Software and Hardware
We offer residential courses to suit all
computer interests, from the complete be-
ginner to the degree level student. The
courses are all informal and tailored
to YOU.

Send for full details to:

Jayssoft Microdevelopments

Blackadder Bank,

Greenlaw,

Berwickshire

Tel: 036-16-458

A COMPUTER FOR CHRISTMAS

Practical computing courses from 31st

December.

Introductory and programming:

£4 an hour

Gift vouchers available

Details:

Tel: Computer Workshop
01-778 9080

RECRUITMENT

WANTED!

Freelance programmers
for a major new project.
Must be EXPERT in either
Amstrad, Commodore or
M.S.X.

Contact: IAN ELLERY
Software Development Manager,
C.R.L. Group Plc.,
C.R.L. House, 9 Kings Yard,
Carpenters Road,
London E15 2HD.
Tel: 01-533 2918

FOR SALE

PRISM VTX5000 MODEM for sale
£50.00ono or swap for Interface 1 +
Microdrive. Phone: Potters Bar. (0707)
42065 after 7pm

48K SPECTRUM NEARLY NEW over
£100 good s/w joystick and Interface
tape recorder, six computer books
£195. Tel: 01-399 0796.

COMMODORE 64, 1541 DISK DRIVE,
1701 monitor, joysticks as new. £500.
Also books, software. Tel: 01-943 0277
evenings.

SINCLAIR 16K AND £50 of software
£100 ono. Phone Dave 676 5038 after
7pm 7 days a week.

PRINTER PLOTTER TANDY CGP 115
compatible with most home computers.
4colour graphics, manual. Excellent
christmas present. £100 ono. Oliver, 9
Windsor Drive, Trowbridge, Wiltshire
(02214) 4571.

COLOUR MONITORS, 14". 2nd user,
excellent condition, no case, £119.50
inc. Tel: Lucas (0482) 702999/701437.
BBC B + DATA RECORDER, 4 weeks
old, under guarantee £350 or best offer.
Tel: High Wycombe 715893.

COMPLETE SYSTEM MTX 512, tape
recorder, Quicksot Joystick, £21 worth
of Brilliant software, manual, books, all
boxed, £240. Tel: (0873) 880362 Even-
ings.

QL — BRAND NEW, full guarantee,
used twice, works perfectly, J.M. Rom,
£350 ono. Tel: 01-968 6742

48K SPECTRUM quickshot 2 joystick
turbo interface £100 worth of games
inc. jet set hunchback, books and mags
sell for £180. Telephone Basingstoke
57839

SELLING OR BUYING a used
computer/equipment in London and the
home-counties? The Computer can
help you! Tel: 0375 742434 (anytime).

Computer Swap 01-437 4343

Free readers entries to buy
or sell a computer.
Ring 01-437 4343 and give
us the details.

KEMPSTON Joystick interface, quick
shot 1, microdrive without interface
horizon, scuba drive, Jet pack, Atari
Atac, Luner Jet men. 3D view + Lunar
cars. £165. Tel: 01-299 1192.

MEMOTECH MTX 512 64K inc. £50 of
s/w £180. Tel: Pete 01 804 4947.

TEXUS Tigg 4/A Home computer be-
ginners manual, dust cover, dual cas-
sette leads. Learning TI basic book + 7
s/w program. £70 ono. Tel: Ripley
46569 (Derbyshire) 4.30pm.

S100 MODULS, static lan 4K £10. Z80
CPU £20. Serial perrville Port £30.
Mister module, composite video input
with sean coils £30. All IC's in holders.
Often huted Tel: Tadley 3375.

SOFTEX IP compiler for sale —
converts any basic into machine code.
Runs on any spectrum only £10.00
monthly £20.000. Tel: 0243 692128.
DD DISK INTERFACE (LVL) £80 for BBC
micro, 40 track DS drive £150. DMP 100
TRS 80, printer £130. Watford Electronics
Ronbards £15. Wanted 40/80
Track Switchelle Drive, Cash waiting
(0225) 27066.

£5,000.000 ORIC? Highest bid above
£20 secures my 48K Oric-1. Excellent
condition, boxed, inc. tapes. if you're
after a bargain, this is it. Go on, Gissa
Ring. Tel: 0702 525389.

AUCTIONS

On The Instruction of:
J. Simon Westhead Esq. F.C.A. and C.J. Chambers Esq. F.C.A.,
 The Joint Liquidators
P.C.S. Distribution Ltd., Wholesale Distributors in Microcomputers and Software, Blackburn.

AUCTION

Wed. 19th December, 1984 at 2.00pm. (Subject to conditions of sale)

At Unit 6, Southlaw Brook, Lower Darwen, Blackburn, Lancs.

THE STOCK OF VARIOUS COMPUTER SOFTWARE

Inc. approx. 7,500 Various Games, Educational and Utility Cassettes. Also, Office Machinery and Fittings and Factory Equipment.

Further details from: G.F. Singleton and Co., 9, Richmond Terrace, Blackburn BB1 7BD. Tel: (0254) 52424

BOOKS

COMPUTER BOOK SPECIALIST!
 Electron, Spectrum, Oric, S.A.E. for lists, D. A. Armstrong, 30 Octavia Street, Kircaldy, KY2 5HH. Fife, Scotland.

WANTED

48K SPECTRUM, EXCELLENT CONDITION, excellent condition, very little used. Also, tape recorder; both boxed, plus fifteen games, including "Hobbit" £100. Tel: Jim, 01-485 2251

EXCHANGE SEA FISHING GEAR, 2 fods, seastreak reel, etc., and golf clubs; 6 irons, 4 woods, putter, bag, trolley, for Commodore printer. Tel: 01-478 7868 (after 6pm).

!! PROGRAMMERS !!

Programs urgently required, cash advances paid. We pay all production and advertising costs. For instant attention without obligations, send copy and instructions or write for further details.
Independent Software, Goldstar House, 198-200 Queenswood Drive, Leeds 6 LS6 3ND.

APRICOT/CALLOG

Substantial fee paid for full operational program enabling CALLOG cassette tapes to be processed on Apricot computer. Write initially to Box (PCWA) Classified Dept., 12-13 Newport St., London WC2R 3LD.



is seeking authors for new titles to add to its highly original and successful book range. Experienced and first time authors are invited to submit manuscript, ideas or fields of interest. Full details of what we can offer from David Lawrence, Book Editor, Sunshine, 12-13 Little Newport Street, London WC2R 3LD.
 Sunshine Publishers of Popular Computing and Dragon User.

THIS SPACE FOR SALE

£18

**TELEPHONE:
 PCW CLASSIFIED
 01-437 4343 Ext 206**

MAKE YOUR PROGRAMS MAKE MONEY!

If you have a game, utility or application to sell, with a view to publishing, (particularly CBM64 or BBC B) phone **JOHN COOK ON: 01-437 4343**

WANTED: Top cash paid for home computers and accessories in good condition. Bring or mail (phone for quote) Computarm, 195 Seabourne Road, Southbourne, Bournemouth. Tel: (0202) 433759.

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

POWERFUL UTILITIES

AMSTRAD SPEEDMASTER

FAST LOAD UTILITY
Fed up with waiting for programs to load? Speedmaster is the answer. Convert all your software to load at **double speed** (choice of save speeds) **100% successful**. Incorporates a sophisticated header reader. An **invaluable** piece of software. **ONLY £7.95**

B.B.C. TAPE TO DISC UTILITY

A very useful utility to help shift those stubborn tape programs onto **your own discs**. Produces a shift code to relocate the memory position of programs to suit the DFS workspace. **ONLY £9.95**

ATARI TAPE TO DISC UTILITY

A dual purpose program that allows single stage boot programs to be shifted onto disc. **Very easy to use** with menu options. Includes output to tape. Works on **all models**. **ONLY £9.95**

COMMODORE 64

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

DISC DISECTOR

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

ONLY £29.95

QUICKDISC

Incorporating Menu Maker

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

ONLY £11.95

FASTBACK

Fast Load Utility
 Convert your slow loading software to **high speed load** with Fastback. The **most sophisticated** program of its type allows you to produce "turbo" loading versions of most single and multi-part software that load **independently** of Fastback. **Simple to use** no programming skill needed. Example: Load "The Hobbit" or "Manic Miner" in **150 secs** (Tried and tested (over 2,000 sold)).
A very professional program.

ONLY £9.95

DISCO

THE TAPE TO DISC UTILITY

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

ONLY £9.95

HARDWARE

DOUBLER

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

ONLY £12.95

ROCKET

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

ONLY £7.95

BIGMOUTH

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

ONLY £7.95

COMMODORE CONNEXION

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

Simple to use and very reasonably priced.

ONLY £14.95



3M SCOTCH DISCS £16.00
 S.S.D.D. LIFETIME GUARANTEE BOX OF TEN.



DATA RECORDER

A **dedicated** data recorder designed for use on the CBM 64 or VIC-20. Specification as CBM but with **pause button**. Models available for the PLUS4 or 16 at same price.
SATISFACTION GUARANTEED.
ONLY £29.95

WIDE RANGE OF SOFTWARE & BOOKS FOR BBC, ELECTRON, SPECTRUM, COMMODORE 64, VIC 20, Oric, GRANITE, HONEYC 8 & 16.

Trade and Overseas Orders welcome. All prices inclusive. **Bank Deposit, PO, Bank Draft or please send Cash Number 0156 69641.**



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

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

HARDWARE

SAVE £££'s!!

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

E.g. Q.L. £379.50
 (inc. p+p, VAT),
 48 HRS (or less) Delivery

Dove Communications
 Tel: 0621 891715

FOR SALE

COMMODORE S.X.64

Portable Business Computer, 64K Ram, integrated 5" screen. Single Disk Drive, £850. M.P.S. 801 Printer £250. 4 Business Software Packages £150. Tel: Marlow (06284) 72320 (anytime).

TORCH DISC PAK, BBC Model B, Monlorex Monitor, Epson RX80FT Printer, all connections, business software for word processing, database and spreadsheet. Barely used. Barretts Solicitors. Tel: 01-248 0551. (Offers considered).

BRAND NEW 48K Spectrum for sale. All leads, manuals, original packaging. 01-788 8749.

- Vic 20**
- (2) Duck Shoot (Master tronic)
 - (3) PUNCHY (Mr Micro)
 - (5) Flight 015 (Craig Communications)
 - (4) Sub Commander (Thorn EMI)
 - (5) Max (Anirog)
 - (-) Crazy Kong (Intelligent Micro)
 - (5) Miss Goid (Visions)
 - (-) Snocler (Visions)
 - (-) Jet Pac (Ultimate)
 - (10) Tank Commander (Thorn EMI)
- (Figures supplied by Boots/Websters)

- Commodore 64**
- (1) Booty (Firebird)
 - (2) Matchpoint (Ocean)
 - (6) Ghostbusters (Activision)
 - (5) Jim Genie (Micro Mega)
 - (7) Chiller (Master tronic)
 - (4) Spart of Stones (CBM)
 - (8) D.T. Decathlon (Ocean)
 - (-) International Soccer (CBM)
 - (-) Scrabble (Leisure Genus)
 - (-) BMX Racers (Master tronic)
- (Figures supplied by Boots/Websters)

- Spectrum**
- (1) Booty (Firebird)
 - (2) Daley Thompson's Decathlon (Ocean)
 - (8) Jet Set Willy (Software Projects)
 - (9) Full Throttle (Microsong)
 - (-) Knight Lore (Ultimate)
 - (-) Underwulde (Ultimate)
 - (-) Skool Daze (Microsphere)
 - (5) Matchpoint (Sinclair)
 - (-) Full City (Elite)
 - (-) Automania (Mikrogen)
- (Figures supplied by Boots/Websters)

- Dragon 32**
- (1) Manic Miner (Software Projects)
 - (2) Hunchback (Ocean)
 - (-) Hungry Herace (Melbourne House)
 - (3) Cuthbert in Space (Microdeal)
 - (5) Chuckie Egg (A & F)
 - (6) Mystery of Java Star (Shards)
 - (7) Mr Dig (Microdeal)
 - (8) Knappeal (Boyond)
 - (4) Dragon Chess (Oasis)
 - (9) Sprite Magic (Knight Software)
- (Figures supplied by Boots/Websters)

- BBC B**
- (1) Sabre Wulf (Ultimate)
 - (1) Manic Miner (Software Projects)
 - (4) Elite (Acorn)
 - (3) Scrabble (Leisure Genus)
 - (6) Football Manager (Addictive)
 - (10) Mini Office (Database)
 - (5) Bird Strike (Firebird)
 - (-) Jet Pac (Ultimate)
 - (7) Swag (Micropower)
 - (9) Duck (Firebird)
- (Figures supplied by Boots/Websters)

- Atari**
- (1) Attack of Mutant Camels (Lamasoft)
 - (7) Zaxxon (Centrosoft)
 - (7) Leggit (Imagine)
 - (6) Oridrunner (Lamasoft)
 - (4) Slinky (Centrosoft)
 - (5) Carnival Massacre (Atari)
 - (6) Encounter (Hi-Tech)
 - (-) Shalablast (I & B)
 - (-) O'Rolloys Mine (C/SOFT)
 - (5) Computer War (Atari)
 - (-) Kraxy Kopter (E/SOFT)
- (3 titles tied for 8th position)
(Figures supplied by Boots/Websters)

- Amstrad**
- (1) Manic Miner (Software Projects)
 - (3) Hunchback (Ocean)
 - (4) Classic Adventure (Amsoft)
 - (3) Bloopers (Alligata)
 - (5) Fantasia Diamond (Hewson)
 - (6) Roland Ahoy (Amsoft)
 - (7) Snocler - S. Davis (CBS)
 - (9) Forest at Worlds End (Interceptor)
 - (-) Harrier Attack (Amsoft)
 - (-) Star Commands (Terminal)
- (Figures supplied by Boots/Websters)

Diary

Event	Dates	Venue	Admission	Organisers
Electron and BBC Micro User Show	Dec 6-8 10.00am-5.00pm Dec 9 10.00am-4.00pm	New Horticultural Halls London SW1	£3.00 adults £2.00 children	Database Publications 061-456 8383
Which Computer? Show (over 18s only)	Jan 15-17 (1985) 10.00am-5.00pm Jan 18 10.00am-4.00pm	NDC Birmingham	Free in advance from organisers	Clapp and Poliak 01-891 5051
Hi-Technology and Computers in Education Exhibition	Trade: Jan 24 10.00am-1.00pm Educationalists: Jan 24 1.00pm-8.00pm Jan 25 11.00am-8.00pm Public: Jan 28 11.00am-6.00pm	Barbican London EC2	Free in advance from organisers	Computer Marketplace 01-830 1612
Apricot and Sirius Computer Show	Feb 5-7 10.00am-6.00pm	Kensington Town Hall London W8	Free in advance from organisers	Paradox 01-241 2354
The LET '85 International Trade Show	Feb 17-18 10.00am-6.00pm Feb 19 10.00am-4.00pm	Olympia 2 London W6	Free in advance from organisers	Turret: Wheatland 0923 777000

Readers' Chart No 3

- (1) Daley Thompson's Decathlon (*Spectrum/C64*)
- (7) Knight Lore (*Spectrum*)
- (4) Elite (*BBC/Electron*)
- (-) Ghostbusters (*C64*)
- (3) Underwulde (*Spectrum*)
- (2) Beachhead (*C64*)
- (6) Danger Mouse in Double Trouble (*Spectrum/C64*)
- (9) Pyjamarama (*Spectrum/C64/Amstrad*)
- (-) Raid Over Moscow (*C64*)
- (-) Jet Set Willy (*Spectrum*)

**Ocean
Ultimate
Acornsoft
Activision
Ultimate
US Gold
Creative Sparks
Mikro-Gen
US Gold
Software Projects**

Week 3: Winners — S G Leggett, Bridge Road, Chessington, Surrey and C Mitchell, Wavertree Nook Road, Wavertree, Liverpool who share the £100 'pot' and receive £50 each.

Now voting on Week 5 — £50 to win

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

All you have to do to vote is to fill in the form below with the names of your current three favourite software titles (or copy the form on to another sheet if you don't want to damage your magazine) and send it off as soon as possible to: Top 10, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP.

We will send £50 each week to the person who correctly predicts that week's top three. If there is no winner then that week's prize is automatically added to the chart on which voting is currently taking place, and so on until someone gets it right! (If there is more than one winner that week's prize — whatever the 'pot' stands at — will be split equally between all the correct entries.)

Voting for Week 5 closes at 2pm on Wednesday December 19. Entries received after that time will not be eligible for inclusion that week's voting. Only one entry per week per person is eligible for inclusion.

Name.....	My top 3: Voting Week 5
Address	1
.....	2
.....	3

KICK OFF

Whilst *Football Manager* has fulfilled many peoples' demands for a Spectrum football game for a long time, being primarily a strategy text rather than an actual kick the ball around simulation. The Commodore got *International Soccer*, complete with large sprite players, cheering crowds and the rest, but there was nothing to touch it on the Spectrum.

That situation has changed, however, with *Match Day*, a sure fire winner from Ocean that lets you actually play a match using joystick or keyboard. Similar techniques to the Commodore game are used — the screen scrolls rather like the movement of a TV camera to follow the action as you pass the ball around, take free kicks, dive dramatically for the ball and so on.

The little men are created using a sprite routine which

makes them appear slightly transparent, although generally speaking there are relatively few colour attribute problems. You can tell which of your team has possession of the ball (or is under your control for a tackle) because his socks change colour! An idea I hope to see in more matches in future.

There are a lot of options in the game — change name, change colour, two player game, play against the computer, etc, you can head the ball, pass the ball through the air or along the ground and generally test your footballing mettle. Ideal for Christmas, I should think.

Program *Match Day*
Price £7.95
Micro Spectrum
Supplier Ocean Software
 6 Central Street
 Manchester M3 8NS

WONDER WEB

Adventure International's *Hulk* got a mixed response. The Spectrum version certainly had excellent graphic illustrations, but many people complained about the adventure itself. It was felt to be too difficult and too arbitrary — maybe people just weren't used to Scott Adams's deviousness.

Anyway, the sequel has just been released, initially on the Commodore, although with versions to follow on most other machines.

In this adventure *Spider Man* takes on Mysterio, evil impresario of tricks and illusions. The graphics are nice, pure comic book stuff and of the adventure

it's best not to speak until I've had longer with it. Suffice to say that a quick look suggests there are a vast number of options at the beginning, many of which look promising, so it shouldn't be too frustrating for beginners. Important too, it understands a wide vocabulary and complex sentences reducing your infatuation levels still further.

Program *Spider Man*
Price £9.95
Micro Commodore 64
Supplier Adventure
 International
 86 New Summer Street
 Birmingham B19 3TE

KEY PRESTO

From time to time computer magazines have printed programs which enable you to perform magic tricks with your computer, now Acornsoft has produced a commercial package for the BBC which collects some of the best computer tricks together under the title *Paul Daniels' Magic Show*.

Nothing too complicated here, though the manual explains how the tricks work and some look fairly impressive, enough to baffle aunts and uncles anyway. Not bad.

Program *Paul Daniels' Magic Show*
Price £9.95
Micro BBC
Supplier Acornsoft
 Betjeman House
 104 Hills Road
 Cambridge CB2 1LQ

BORING



Activision scored a winner of awesome magnitude with *Ghostbusters* but *Beamrider* is a definite plummet — quite honestly this is a £1.99 game being sold for £7.99. The plot, at least, requires little explanation: your laser ship sits on the end of various lines disappearing into the distance — like an edge on view of a flat grid.

Along this grid zoom baddies. You just blast away, occasionally a baddie is a different colour and has to be shot with a torpedo rather than a laser. Sometimes the baddies move in a different way. Amazingly boring — you have no reason to buy it unless you are a close relative of one of the programmers.

Program *Beamrider*
Price £7.99
Micro Spectrum
Supplier Activision
 15 Harley House
 Marylebone Road
 London NW1



This Week

Program	Type	Micro	Price	Supplier	Ed	BBC	Price	Supplier
Crystal Theft	Ad	Amstrad	£7.99	Wiccasoft			£14.95	Blandford Press
Fruity Frank	Arc	Amstrad	£6.95	Kuma			£9.95	Acornsoft
American Football	S	Amstrad	£9.95	Amsoft			£8.95	Hodder + Stoughton
Snooker	S	Amstrad	£8.95	Amsoft			£8.95	Hodder + Stoughton
Screen Designer	UI	Amstrad	£14.95	Amsoft			£9.95	Acornsoft
Acheton	Ad	BBC	£9.95	Acornsoft			£9.95	Acornsoft
Maze	Ad	BBC	£9.95	Acornsoft			£9.95	Acornsoft
Quondam	Ad	BBC	£9.95	Acornsoft			£9.95	Acornsoft
The Seventh Star	Ad	BBC	£9.95	Acornsoft			£9.95	Acornsoft
Firebug	Arc	BBC	£9.95	Acornsoft			£11.95	Arliasoft
Labyrinth	Arc	BBC	£9.95	Acornsoft			£9.95	Arliasoft
Butterflies/Putting	Ed	BBC	£8.95	Hodder + Stoughton				
Introducing the Dots	Ed	BBC						
Paul Daniels' Magic Show	Ed	BBC						
Tiles/Fence	Ed	BBC						
Time Files/Tanker	Ed	BBC						
Black Box/Gambit	S	BBC						
Go	S	BBC						
Cocktail Maker	UI	BBC						
Spider Man	Ad	Commodore 64						
Tristan and Isolde	Arc	Commodore 64						
Archon	Arc	Commodore 64						
Choplifter	Arc	Commodore 64						
David's Midnight								

New Releases

A MESSAGE

How much longer can this continue? How many companies out there are working on games which involve 'over (several) screens' moving a little person, alien, dog, cat, wombat or duck around them collecting keys, crystals, comical trinkets or power orbs? How many have wacky comic music taken from post war musicals? And when all these tedious ingredients have been stuck together, how many of them will end up with a title that alliterates, with the second word being a proper name? Can I offer a word of advice to all such companies? Stop it now. Please.



Mutant Monty, and I quote, 'has only to make his way through 40 rooms collecting gold en route and rescue the damsel in distress, there are countless aliens all set to stop him'. It is for the Commodore 64. It is by Artic. I'm depressed.

Program *Mutant Monty*
Price £6.95
Micro *Commodore 64*
Supplier *Artic Computing*
Main Street
Brandesburton
Driffield YO25 8RL

OPERA, OPERA

Tristan and Isolde, Medieval German Classic diatonicic shattering opera by Richard Wagner and now a computer game. Well, not really. This T+L has nothing whatsoever to do with the previous ones except that it involves a princess and a prince and has, apparently, been developed in Germany.

What it is is a rather strange animated graphic adventure. All allowed actions have graphic consequences — the choices you have available are made from a menu screen which may or may not give you further options, eg, if you press W for walk you get a further set of options indicating directions.

The character that represents Tristan (although he is also titled Kunibert, somewhat confusingly, in the draft manual I have) is a very bizarre looking sprite who seems only to move one leg when he walks. I don't know why.

As usual, the object of the quest is to rescue a poor woman — Isolde (although she is also called Kunigunde) so you move about picking up useful objects to get through various rooms — portrayed in a sort of 3D. So far I've been bashed by monsters almost immediately so haven't got very far.

It is quite unusual, and reasonably compelling in a funny sort of way, but I think it could



Skool Daze is such an obvious subject for a computer game it's a wonder nobody ever thought of it before (well, almost nobody). Not only is it a good idea, the programming is excellent and the graphics good enough to distinguish the different oiks from one another — the swot looks snooty and the bully lumbers about.

The screen displays a cross section of the school with schoolboys milling about, different classes taking place and so on. You control one particular schoolboy — Eric (although you may rename him if you wish) — who must retrieve some not altogether favourable school reports from the school safe before the headmaster sees them.

Retrieving the report requires you to master a plot so complicated it makes *The Big Sleep* seem like Enid Blyton. Here goes (stop me if I go too fast for you). First of all, you have to make all the school shields flash by touching them — some you cannot reach and so you will need to tread on a lesser boy to reach them. This combined with attending lessons when told and leaving the school at playtime (otherwise you get lines — over 10,000 and game over) will make the masters become disorientated and, if knocked over, will give you one letter of the code of the school safe. However, the history master will only reveal his letter if you get his date of birth

TAKE FIVE LINES



and write it onto a blackboard before he enters that room (if the board is clean).

Having got all the letters, you then have to put them in various orders (you know that the Headmaster's letter is always first). To do this chalk the order of letters onto a blackboard, rush to the safe and see if it opens. Anyway... if you get an open safe you then have to rush around stopping all the flashing shields by jumping up and touching them again.

If the plot doesn't daunt you, you'll love *Skool Daze*, it really does recall images of the Bash Street Kids and Lord Snooty and his pals and the graphics are wonderful.

Program *Skool Daze*
Price £8.95
Micro *Spectrum*
Supplier *Microsphere*
Computer Services
72 Rosebury Road
London N10 2LA

This Week

Magic	Arc	Commodore 64	£9.95	Ariolasoft
Eddie Kidd Jump	Arc	Commodore 64	£6.95	Martech
Challenge	Arc	Commodore 64	£6.95	Tymac
Gandalf the Sorcerer	Arc	Commodore 64	£9.95	Ariolasoft
Hard Hat Mac	Arc	Commodore 64	£7.95	Ocean
Hunchback II	Arc	Commodore 64	£5.95	Supersoft
Kami Kaze	Arc	Commodore 64	£7.95	Ocean
Kong Strikes Back	Arc	Commodore 64	£9.95	Ariolasoft
Lode Runner	Arc	Commodore 64	£11.95	Ariolasoft
M.U.L.E.	Arc	Commodore 64	£11.95	Ariolasoft
Murder on Zinderneuf	Arc	Commodore 64	£9.95	Ariolasoft
One on One	Arc	Commodore 64	£9.95	Ariolasoft
Operation Whirlwind	Arc	Commodore 64	£9.95	Ariolasoft
Realm of Impossibility	Arc	Commodore 64	£9.95	Ariolasoft
Raid on Bungling Bay	Arc	Commodore 64	£9.95	Ariolasoft
Spelunker	Arc	Commodore 64	£9.95	Ariolasoft

Football League Team	S	Commodore 64	£3.95	D Spencer
Birthday File	Ut	Commodore 64	£14.95	Blandford Press
Synth	Ut	Commodore 64	£3.95	D Spencer
Beamrider	Arc	Spectrum	£7.95	Activision
Pitfall II	Arc	Spectrum	£8.99	Activision
Skool Daze	Arc	Spectrum	£5.95	Microsphere
Family Quiz	Ed	Spectrum	£14.95	Blandford Press
Match Day	S	Spectrum	£7.95	Ocean
Software Star	S	Spectrum	£8.95	Addictive Games
Garden Planning + Ds	Ut	Spectrum	£14.95	Blandford Press
Hisoft C	Ut	Spectrum	£25	Hisoft
Ultrakit	Ut	Spectrum	£9.45	Hisoft

Key: Ad — adventure/Arc — arcade/Ed — education/
 S — strategy-simulation/Ut — utility

use a couple of graphic designers beefing up some of the presentation. Good for fairly young kids perhaps.

Program *Tristan and Isolde*
Price £8.95
Micro *Commodore 64*
Supplier *CRL House*
 9 Kings Yard
 Carpenter's Road
 London E15 2HD

3-D FUN

3D Starstrike continues Realtime Software's flirtation with three dimensions seen most recently in its *Battlezone*-inspired 3D tank game.

3D Starstrike is a fast reflex game with several sections and plenty of vector style line graphics. The first section is pretty much a straight shoot the baddies in space before they shoot you, but the graphics are good and even the sound, usually hopeless on the Spectrum, is reasonable.

If you survive this you arrive at your target, a planet littered



with 3D skyscrapers whose tops you can blast to bits. Eventually find a duct leading to two cooling ports which, if destroyed, lead by some means or other, to the end of evil everywhere.

The duct section is particularly good fun — you appear to fly down a narrow channel with barriers blocking the way — to get through you need lightening responses to avoid hitting them. Personally, I often find multi section games a bit disjointed — the different bits too often look as though they have been bodged together to make the game a bit more interesting. Here I think it works though — the pieces slot together neatly. A must for the arcade fan.

Program *3D Starstrike*
Price £8.95
Micro *Spectrum*
Supplier *Realtime Software*
 Prospect House
 32 Sovereign Street
 Leeds LS1 4BJ

TON UP

Motocross! is a motor cycle game for the Commodore 64 — possibly the only one. Released in America by Tronix, it has been imported and issued here by System 3 Software.

Visually it's nothing spectacular — the path is marked out by a sort of bollard arrangement and the motorcycle and rider are pretty small. However, the actual game is pretty good, apart from anything else it is astonishingly fast and really does require quick reflexes.

Not only must you guide your



bike around an increasingly difficult track but, unlike some other racing type games, the track is chock full of other riders whom you must avoid and, if possible, overtake. It proves you don't need spectacular graphics to create exciting games. Well worth a look.

Program *Motocross!*
Price £7.95
Micro *Commodore 64*
Supplier *System 3 Software*
 138 Carlton Avenue East
 Wembley
 Middlesex

FAIR FUN

Kong Strikes Back is a sequel to *Donkey Kong* which means, roughly, that you get exactly the same ideas, but with some different backgrounds and settings. So you have to move a little man around dodging things until he reaches a damsel in distress.

However, Ocean's *Kong* sequel is definitely better than sequels usually are, a little

thought has gone into it. *Kong* has escaped (again) and has taken refuge in a funfair high up on a roller coaster. You must find your way around the roller coaster clambering along the tracks up to *Kong* and helpless woman.

That may sound pretty boring, but the fairground music, the way the cars speed up and slow down according to the slope of the track and the general pace of the game



make it quite good fun.

Program *Kong Strikes Back*
Price £7.95
Micro *Commodore 64*
Supplier *Ocean Software*
 6 Central Street
 Manchester M3 5NS

Compiled by Graham Taylor

Now Releases is designed to let people know what software is coming on the market. If you have a new game or utility which you are about to release send a copy and accompanying details to: *New Releases*, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

This Week

Acornsoft, Betjeman House, 104 Hills Rd, Cambridge CB2 1LQ, **Activision**, 15 Harley House, Marylebone Road, London NW1, 01 486 7588, **Addictive Games**, 7a Richmond Hill, Bournemouth BH2 6HE, 0202 296404, **Adventure Int.**, 85 New Summer Street, Birmingham B19 3TE, 021 643 5102, **Amsoft**, Brentwood House, 169 Kings Road, Brentwood, Essex, 0277 230222, **Ariolasoft**, Retail only, **Blandford Press**, Link House, West Street, Poole, Dorset, 0202 671171, **CRL**, CRL House, 9 Kings Yard, Carpenter's Road, London E15 2HD, 01 533 2918, **D Spencer**, u/k, **Hisoft**, 180 High Street North, Dunstable, Beds. LU6 1AT, 0582 696421, **Hodder + Stoughton**, PO Box 704, Mill Road, Dunton Green, Sevenoaks Kent TN13 2YG, **Kuma**, Kuma Computers, 12 Horseshoe Park, Pangbourne, RG8 7JW, 07357 4335, **Martech**, Martech House, Bay Terrace, Pavensy Bay,

East Sussex BN24 6EE, 0323 768456, **Microsphere**, 72 Rosebury Road, London N10 2LA, 01 883 9411, **Ocean**, 6 Central Street, Manchester, M2 5NS, 061 832 6633, **Supersoft**, Winchester House, Canning Road, Wealdstone, Harrow Middlesex HA3 7SJ, 01 861 1166, **Tymac**, Nettleton House, Calthorpe Road, Edgebaston, Birmingham B15 1RL, 021 643 9524, **Wiccasoft**, 107 Bollington Road, Bollington, Macclesfield, Cheshire SK10 5EL

This Week is a new section that covers all the new software coming on to the home micro market each week. All suppliers should send details of their new programs to: *This Week*, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.



Nightmare world

Over dinner the other night with an accountant friend of mine the subject of artificial intelligence came up. I, of course, was arguing, vehemently, that his job would be one of the first against the wall come the computer revolution and he, equally of course, was arguing that no computer could ever replace his ability to spot a fraudster at 20 paces.

Now, fascinating though this conversation was for a while, it occurred to me that both our conversation and many similar debates filling the pages of scientific journals at the moment, are grasping the nettle at the wrong end.

The important question to debate is if we need new technology not to speculate idly about what we believe will or won't be possible.

In any event the latter question demands a high level of scientific knowledge and foresight, whereas the former simply requires the good common sense of the man on the Clapham omnibus.

So, let us remove the need for scientists for a while by assuming that they have managed to construct a super computer/program/robot capable of carrying out any task we might wish and ask ourselves the question — what do we want it to do?

Well for a start, we can replace all the dangerous, unpleasant and repetitive jobs such as coal mining, rubbish collection and factory-line assembly. The wealth of human talent released could be re-employed in

management jobs and the like by the boom created through cheaper energy and manufacturing costs.

Why stop there? Our super computer could also replace these new management jobs. It could run all aspects of industry from process and control to marketing leaving the workforce free to take life easy doing whatever gives them pleasure.

Indeed the last area of human endeavour would be in the leisure field. A small elite of mankind would be exploiting their artistic talents keeping the rest of us entertained.

This, incidentally, is very much the kind of utopian 'golden age' that Sir Clive Sinclair keeps telling us we are on the brink of achieving.

But, now remember my premise that the super computer can replace any human task (only faster and better) — even these few jobs could go leaving all of us listening to computer-generated music and TV pictures or reading computer written and published books whilst eating our computer cooked dinners!

A nightmare? Definitely. We shouldn't be discussing if we can make these machines, but rather *how we can stop them being made*, which is not as easy as it might seem.

We live in a world economy. To be successful we need to compete for business. If the Japanese and Americans install computers to mine their coal and oil or build their cars cheaper and better then we must, in a capitalist, non protectionist, world, do the same.

This upward spiral of automation has been continuing for centuries and the pace of development of technology has always kept pace with our desire and need to use it. I see no reason to suppose that this trend will come to an end now unless we actively intervene and do something about it.

I am no Luddite but unless we do something immediately we will head inexorably for the nightmare world I've described.

Glen Counsell

Squared ages

Puzzle No 137

Professor Otto Hex was browsing through some back copies of *Mathematical Monthly Miscellanea*, the popular journal for all number freaks, that has just celebrated its fiftieth anniversary. One of the items which attracted his attention was the following:

"Readers may be interested to know that this year is a very important one for London mathematics teacher Mrs Annie Nutt. It has been pointed out that Mrs Nutt, her daughter, and her grand-daughter all have ages (in years) whose squares are in arithmetical progression. In other words, the difference between Mrs. Nutt's age squared and her daughter's age squared is the same as the difference between her daughter's age squared and her grand-daughter's age squared. But what is even more remarkable is that this difference is exactly equal to the present year!"

Unfortunately, the ages were not given but the Professor, assuming that the ages were biologically and legally possible, was able to work them out. But then, of course, he did have the advantage of knowing the date of the journal.

Can you determine what these ages were, and say in which year this curious coincidence took place?

Solution to Puzzle 132

I took books numbers 2,5,6,8 and 9 having respectively 89,147,168,192 and 204 pages. This makes a total of 800 pages.

The program puts the values representing the number of pages in each book into an array. The five *For/Next* loops then call these values in sequence and test the totals to determine if it equals 800.

```
10 DIM A(10)
20 DATA 64, 89, 107, 111, 147, 168, 175,
182, 204, 241
30 FOR N = 1 TO 10
40 READ X
50 LET A(N) = X
60 NEXT N
70 FOR P = 1 TO 6
80 FOR Q = P + 1 TO 7
90 FOR R = Q + 1 TO 8
100 FOR S = R + 1 TO 9
110 LET X = A(P) + A(Q) + A(R) + A(S) + A(T)
120 NEXT T
130 IF X = 800 THEN PRINT A(P);A(Q);A(R);A(S);A(T)
140 NEXT T
150 NEXT S
160 NEXT R
170 NEXT Q
180 NEXT P
```

Winner of Puzzle No 131

The winner of Puzzle No 132 is Phil Arney of Hillmont Rd, Esher, Surrey, who receives £10.

Rules

If the puzzle can be sensibly solved using a computer, then the winner will have included a listing of the program used to find the correct answer. The closing date for Puzzle No 137 is December 28.

The Hackers



WITCH'S CAULDRON

SPECTRUM 48K £6.95



Gor blimey,
a hopping good
programme



MIKRO-GEN

A LAUNDROMAT, SOMEWHERE IN PILAND (WHERE THE AUTOMATA MOB HAVE GONE TO FIND OUT ABOUT THEIR TAX). CLAIR IS TUCKING INTO PLASTICENE SANDWICHES, BUT WHO GETS THE TAX RELIEF? THEN THERE'S THIS ANGEL...



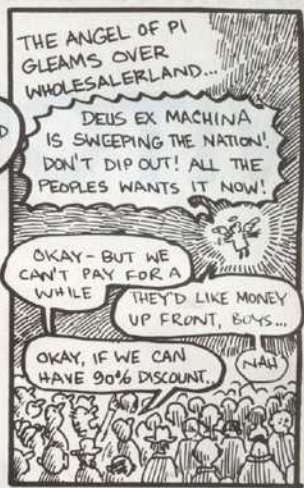
NOW WE'VE RESCUED THEE, 'OW ABOUT THIS MESSAGE?



MY MESSAGE IS FOR THE WHOLE-SALERS! I MUST SPEAK UNTO THEM, AND SPREAD THE WORD ABOUT DEUS EX MACHINA!

IS HE ON OUR SIDE?

NO, HE'S ON 5%



THE ANGEL OF PI GLEAMS OVER WHOLESALERLAND...
DEUS EX MACHINA IS SWEEPING THE NATION! DON'T DIP OUT! ALL THE PEOPLES WANTS IT NOW!

OKAY - BUT WE CAN'T PAY FOR A WHILE... THEY'D LIKE MONEY UP FRONT, BUYS...

OKAY, IF WE CAN HAVE 90% DISCOUNT. NAH



I'M WILLING TO DISCUSS IT. I'VE READ THE REVIEWS OF 'DEUS'

ME TOO. MY COMPANY IS VERY 'INNERESTED...

SUCKERS! IT'S ALL HYPE...



DON'T GIVE IN TO THEM! I KNOW DEUS IS GOOD, BUT IT'S OUR DUTY TO BLEED THESE SMALL COMPANIES WHITE, AND...

THAT'S NOT THE WAY I SEE IT, PAL! ANYONE ELSE COMING ALONG WITH ME?

YEAH - I WILL

RENT A CAMEL

ME TOO.



SO THE THREE WISE WHOLE-SALERS LEAVE THE FOOLISH WHOLESALERS AND CAMEL IT TO PILAND...

THERE IT IS! THE PI IN THE SKY!

WE GOTTA GO THROUGH CUSTOMS, YET, LADS!



PIGAT CUSTO

WE'RE 3 WISE WHOLESALERS, HERE ON BUSINESS. I REPRESENT THORN EM!

I REPRESENT TERRY BLOOD

I REPRESENT LIGHTNING AND CENTRESOFT



ANYTHING TO-A DECLARE?

THE CUSTOMS OFFICER IS ALWAYS RIGHT

NOPE!



YOU'D BETTER TAKE ALONG SOMETHING! SHE'S THERE EATING COAL LIKE THERE'S NO TOMORROW. COME ON, ROLL UP! RATTLES, BOOTIES, WATCHES, FARRINGS, PEN SETS...



BACK IN THE CAR PARK...

THIS PLACE IS GROWING ON ME. IT LOOKS DEAD COSY WITH THESE CRIZZY DECORATIONS...

AYUP - IS THAT THE BEATIN' OF 'UGE WINGS I' EAR?

BLIMEY! IT'S A STORK!

NAH, LAD, LADY CLAIR ALWAYS USES BUTTER!



SIGN HERE.

AHHAHA! I'VE BEEN EXPECTING THIS. TA.

LEMME SEE MY LI'L TAX RELIEF, KID!

YOUR KID? MINE I THINK YOU'RE BOTH WRONG, IT'S...



IT'S... GAGAAA-GAAA-GA

WHO PLACED THE ORDER FOR THIS LI'L CONSIGNMENT? FIND OUT NEXT WEEK!!