

40 Rock Rd.

POPULAR Computing WEEKLY

Only 40p.

29 November-5 December 1984

It's the best selling weekly

Vol 3 No 48

Coleco pulls out

COLECO — manufacturers of the Adam computer and the Colecovision video games machine — has pulled out of the UK market.

The news comes after continuing rumours that the company had abandoned its sales efforts for the Colecovision earlier this month (see *Popular Computing Weekly*, November 15).

The machines are manufac-

tured by CBS in the US, and marketed in this country by Ideal Toys. "CBS's involvement with Colecovision is not going to continue," said Philip Gibbs, director of marketing for electronics. "We are aware that a lot of consumers who already own a Colecovision will need software support, and within the next week we will be appointing a sales agency to handle that side of things."

"The product is still in the shops, being handled by one distributor, Hyde Park Clothing Company."

Hyde Park Clothing Company is reported to have taken delivery of 160,000 games cartridges and 40,000 consoles sold as remaindered stock. The company's manager, Mr Spiro, said, "We have bought the stock, but I will not divulge how many units. The figure of

QL network by Prism

A COMPUNET-style communications network and database is being planned for QL owners.

The QL network is being planned as a joint Sinclair/Prism venture. Prism, which already runs the Micronet 800 Prestel database, will be primarily responsible for developing and setting the new system up.

"Negotiations with Sinclair are still in their very early stages at the moment," explained Richard Hease, Prism's managing director. "We are planning something that will be for QL owners only, so it will be like Compunet in that sense. At the moment, we are looking at the different networks that could possibly run the system."

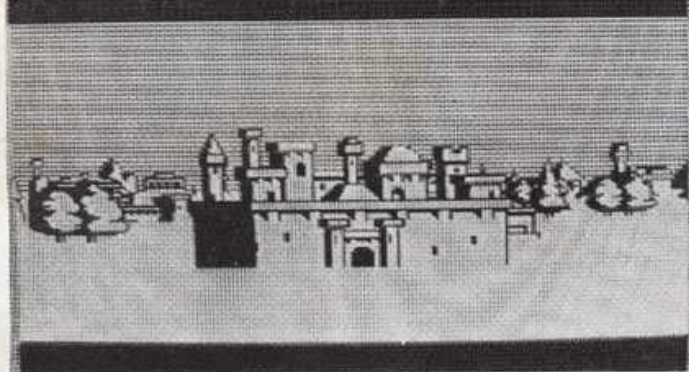
Prism will also be the exclusive distributors of a QL dedicated modem, manufactured by OE, and due for launch at the Which Computer? Show in January.

The OE modem will be available in three separate units. Q-con is the interface connecting with the QL's Serial 2 port. It can be purchased separately so that an alternative modem

continued on page 5

After Midnight — Doomdark

Tarithel the Fey stands at the Gate of Vannor looking North to the City of Imriel. Three hours of the day remain.



THE SEQUEL to *Lords of Midnight*, *Doomdark's Revenge*, is now in the shops.

Morkin has been kidnapped by Shareth, Doomdark's daughter, and Luxor, Rorthron

and Tarithel the Fey must join forces to rescue him.

Available so far only for the Spectrum, *Doomdark's Revenge* costs £9.95.

Sinclair confirms portable

SINCLAIR has now confirmed that it is working on a new portable micro to be launched in 1985, (see *Popular Computing Weekly* November 8).

Main features of the portable machine include a single microdrive, flat screen display, and a price of around £300.

The design of this new machine is based on that of the Spectrum and it will be fully compatible with all current Spectrum software.

Entirely battery operated, the machine will use C-MOS Ram technology, which uses relatively little power, and is therefore ideally suited to the

continued on page 5

CHRISTMAS SOFT HITS

INSIDE

AMSTRAD DISC DRIVE REVIEW

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 2254 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, Sirius, 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

Two machines in two weeks — the QL+ and the Spectrum Portable. If Sinclair carries on like this we'll be up to our knees in micros by the New Year.

What Sinclair is doing is actually very sensible. It has two basic design frameworks — one, an ultra-low-cost design based around the Z80 chip — the Spectrum. The other a more sophisticated concept using the 32-bit 68000 series of processors — the QL.

However much you want to spend Sinclair can offer an answer with machines priced at £130, £180, £400 and £500.

Yet before the Spectrum Portable is possible Sinclair has to make a fundamental decision about display type. With its flat-screen TV it has pinned its hopes on conventional TV technology — the cathode ray tube. Despite the considerable development effort expended to produce the flat tube, the result is disappointing. The black and white screen is very small, with only a narrow viewing angle and the picture tends to be unstable.

For the TV it is an acceptable compromise. For the Spectrum Portable it would be useless — imagine *Tasword* on a 40-column screen less than two inches wide. It just isn't on. Sinclair could certainly push to produce a bigger, better flat-screen tube, but, fundamentally, the conventional TV tube, whether it is cleverly bent so as to give the illusion of being flat or not, isn't the answer.

Anyone who has seen the Sanyo liquid crystal colour TV will realise that Sinclair must think again. A liquid crystal display is a digital technology; its picture is perfectly stable, and it consumes little power, making it ideal for a battery-operated device.

Not only that but six inch liquid crystal displays are now a commonplace option on many portable business micros.

POPULAR Computing WEEKLY

Vol 3 No 48

>Presents...

News > Elite action > Tony Crowther on the move.

5

Star Game > *Astro-Link* — for budding Shuttle pilots on the CBM 64

10

Streetlife > John Cook travels to the Land of Youth and talks to Gargoyle Games

12

Hardware Reviews > Amstrad Disc Drives given a whirl > Play it again with the Commodore Music Maker

14

Software Reviews > Latest Ultimate game *Knight Lore* > Go into overdrive on the Electron

17

Christmas Soft Hits > Graham Taylor dons beard and breaks out the reindeer

23

BBC and Electron > One for video owners — Indexer for the BBC B by A J Carter

30

The QL Page > A QL Rom bug corrected by Andy Pennell

34

Dragon > The final helping of machine code routines by Roger Walton

37

Commodore > C16 Special — Banker — adapted from the best-selling book by David Lawrence

40

Best of the Rest > Letters 8 > Spectrum 28 > Open Forum 43 > Arcade Avenue 43 > Microradio 44 > Music Box 46 > Book Ends 50 > Adventure Corner 54 > Peek & Poke 57 > Readers Chart, Top Ten, Diary 66 > New Releases, This Week 67 > Puzzle, Ziggurat, Hackers 70

>Futures...

Hi Rom Lo Rom for the Amstrad...Siel's low-cost MIDI music keyboard reviewed...and Dragon Star Game



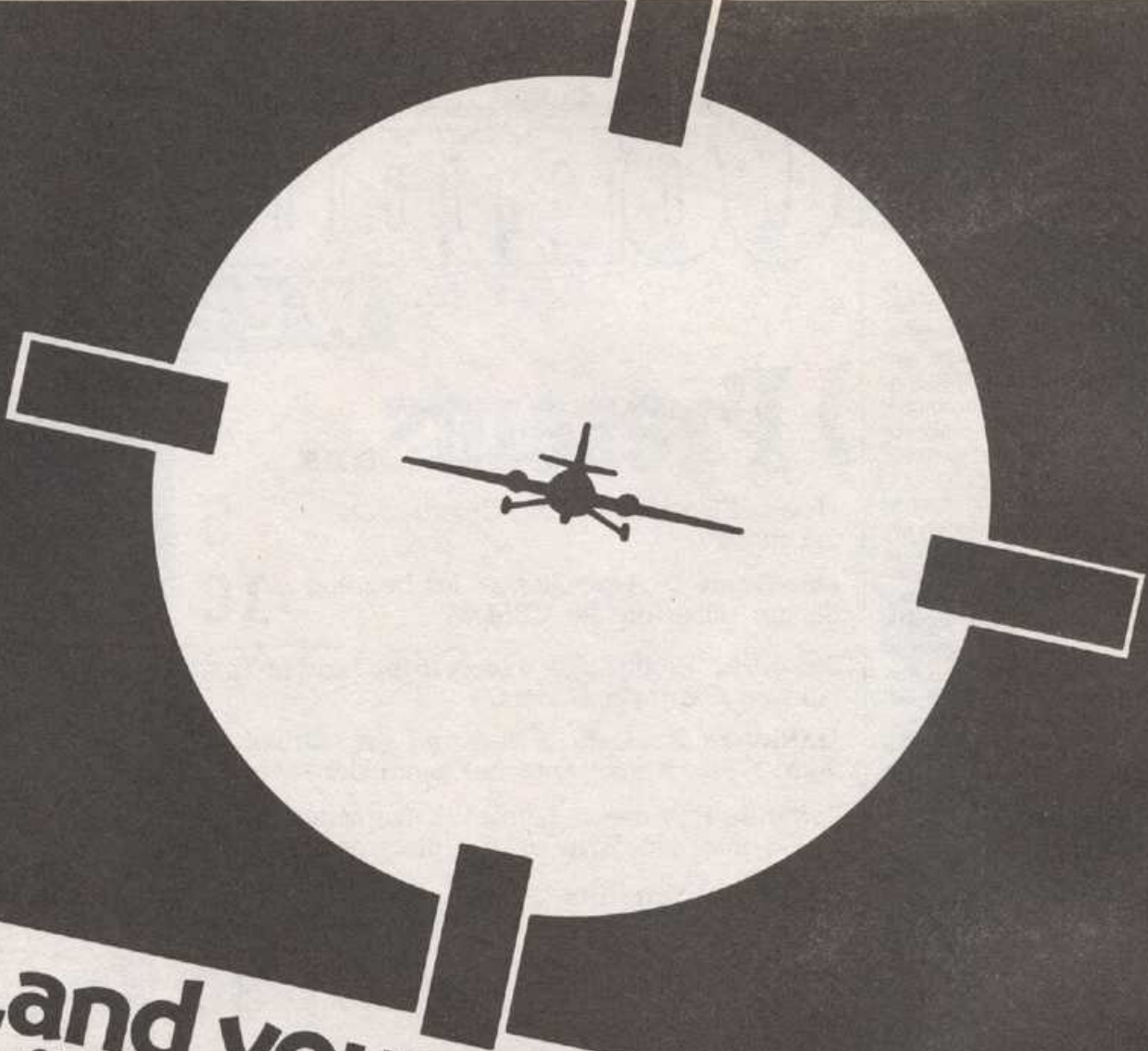
Editor David Kelly News editor Christina Erskine Features editor Graham Taylor Software editor John Cook Production editor Lynne Constable Editorial secretary Geraldine Smyth Advertisement manager David Lake Assistant advertisement manager Alastair Macintosh Advertisement executive Tom Watson Classified executive Diane Davis Advertising production Lucinda Lee Administration Theresa Lacy Managing editor Duncan Scott Publishing director Jenny Ireland. Published by Sunshine Publications Ltd, 12-13 Little Newport Street, London WC2H 7PP. Tel 01-437 4343 Telex 296275 Typeset by The Artwork Group, 55-63 Goswell Road, London EC1, in association with Ink on Paper Ltd Printed by East Midland Litho Printers Ltd, Oundle Road, Woodston, Peterborough PE2 9QR Distributed by SM Distribution, London SW9, tel 01-274 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



Land yourself a trip on a million pound computer.

In December's Your Computer there's a chance to win a trip on a million pound flight simulator.

There's a feature on advanced computer graphics that looks at Pioneer video discs and includes graphics routines for the ZX81, Spectrum, BBC, Dragon and Oric. Plus a review of the new Yamaha computersynthesizer. And lots, lots more.

December's Your Computer is out now. Fly down to your newsagent and get it.

PUBLISHED BY
ELECTRICAL-ELECTRONIC PRESS



Parker pulls out

AMERICAN software company Parker Brothers has announced it is withdrawing from the software market in this country.

"The product planned for Britain for 1984-5 has been withdrawn," explained a Parker spokesman.

"However, I don't think this is a permanent withdrawal. Palitoy, which owns Parker Brothers, feels that the market is no longer viable. Still, if the market turns favourably, I think it will reconsider the decision

— perhaps at the 1986 Toy Fair.

Parker ran into problems because most of its software turnover came from titles for the Atari VCS machines. When Atari reduced its software prices down to £9.99, Parker continued to charge £29.99 and sales dropped.

"Our Spectrum and Commodore 64 releases were on cartridge and disc, respectively — again expensive products relying on high profit margins. The market share wasn't large enough," Parker has also suffered because Rom software for the Spectrum never took off and the penetration of disc units into the C64 user base is the UK is a fraction of the figure for the US.

Coleco

Continued from page 1

40,000 is quite wrong."

Another Ideal Toys' spokesman further commented, "The company is to concentrate less on electronic goods and more on a broad product range, such as CBS's Cabbage Patch Doll, and Child Guidance series of educational toys, which satisfy the needs of the market place."

After its launch, as the star of the 1983 summer Consumer Electronics Show, the 128K Adam computer system has been plagued by problems, first with late delivery and then with the reliability of its high-speed tape drive.

Its price was recently cut dramatically in the US, leading to speculation that it may be withdrawn from the American market after Christmas — rumours which CBS strenuously deny.

QL Network

Continued from page 1

can be used if desired. Q-con also contains the built-in software which provides the Prestel operating system. This software is also available separately on Microdrive.

Q-mod, the second part, is a V23 modem, operating at 1200/1200 baud (half duplex) and 1200/75 baud (full duplex).

Q-call, the third part, gives an auto-dial, auto-answer facility.

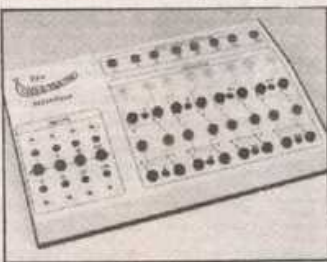
Prices for the units are Q-con: £79.95; Q-mod: £79.95; and Q-call: £39.95.

Details from OE, North Point, Gilwilly Industrial Estate, Penrith, Cumbria.

Express transfer to Quicksilver

TONY Crowther, successful C64 author of *Potty Pigeon*, *Suicide Express* and *Wanted: Monty Mole*, has signed up with Quicksilver to market his next two releases.

Tony left Gremlin Graphics a couple of months ago, and has spent the intervening time setting up and expanding Wizard Development, a BBC hardware and software company.



Spectrum portable

Continued from page 1
portable machine.

The flat-screen display for the portable is likely to be based on technology developed for the Sinclair flat-screen TV.

Continuing development work on the display will mean that the Spectrum Portable is unlikely to be launched before mid-1985.

Only one castle for Atari

ATARI Corporation (UK) has taken legal action against MRM Software over MRM's *Castle of Gems* game for the BBC.

Atari claims that *Castle of Gems* is a copy of *Crystal Castles*, an arcade game for which Atari

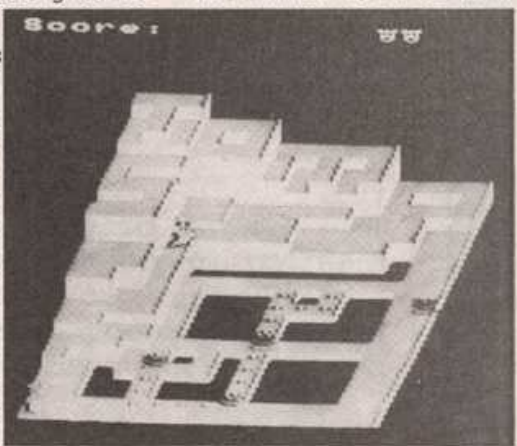
owns the rights.

"The dispute with MRM was resolved out of court," said Jon Dean, Atari's UK product manager. MRM has undertaken not to advertise, sell, supply, or distribute any further copies of *Castle of Gems*.

"Our attention was first drawn to *Castle of Gems* in a computer magazine review which commented on the similarity between the two games," Jon continued. "When we saw the game ourselves, we counted 32 distinct similarities. Such similarities between games could include, for instance, the

colours used, the graphics, type of scrolling and so on.

"This action is only the first of several we intend to pursue fully. We hold the licence to a number of games, such as *Pacman*, *Donkey Kong*, and *Pole Position*, and it is not in Atari's interest to have unlicensed versions of these games on the market. There are a number of companies which do have unauthorised versions of



our games on release, and if necessary, we will take them to court."

Atarisoft's own conversion of *Crystal Castles* for the BBC is due to appear in December at £9.99.

The company is also planning to convert the game for the Atari 800XL early next year.

His two games to be marketed by Quicksilver are *Black Thunder* and *Gryphon*, both for the Commodore 64.

"*Black Thunder* is a revamped version of *Suicide Express* — I've done a lot of changes on-screen and altered the name. *Black Thunder* will be more of a 'finished' version than the original release," said Tony.

Black Thunder should be available in December, with *Gryphon* appearing just after Christmas. Both games are provisionally priced at £7.95.

BT bias for rights to Elite

THE rights to convert Acornsoft's highly successful title *Elite* for machines using the Z80 processor were up for auction last week and British Telecom's software arm, Firebird, gained the licence for 'a substantial sum'.

This gives Firebird the option to convert *Elite* to the Spectrum, Amstrad CPC 464, MSX and the long-awaited Enterprise computers, all of which use the Z80 processor.

"Firebird will definitely be producing a Spectrum version, and probably a CPC 464 version," said Jacqui Lyons of Marjacq Scripts, agents for *Elite*'s authors Ian Bell and David Braben.

When released, *Elite* will form part of Firebird's 'gold' premium range of software. Firebird has already released games in its 'silver' or budget-priced series.

Elite on the Spectrum is expected to cost around £15, and is planned to be available in April-May 1985.

As yet there are no firm plans to produce versions for MSX.

**More news
on page 7**



PRESENT A NUMBER 1

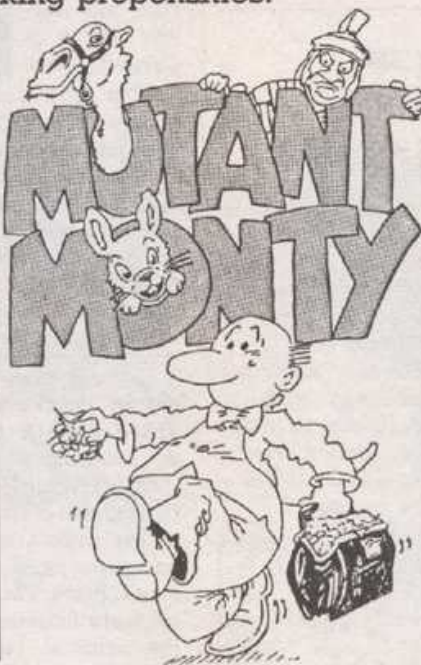
SMASH HIT!

PRESS RELEASE

Mutant Monty

This puzzle proves to be positively perplexing and perpetually pleasing to posers, presenting persistently provoking problems; providing profuse pleasure and producing a palliative or placid panacea to people possessing a propensity for persistence, patience, perspicacity and painstaking propensities.

A pleasurable pantomime with Monty participating in a penetrable panoply of puzzles, parading particularly pleasurable patterns panning paramilitary paraphernalia, performing pulsating perilous peptic projectiles in perfunctory profusion.



A palpitating parable packaging a peculiar parody with piercing passion not paralleled in any perimeter. Karl Jeffery has painstakingly produced this pandemonium of pleasurable phenomena price £6.95, poised purposely for CBM 64 and Spectrum 48K.

A plethora of 40 polemic screens, pneumatic prismatic power, periphrasis - the perfect performance.

Phew !

Phone

(0401) 43553

01 - 995 - 2151

arctic computing ltd.

Head Office: Main Street, Brandesburton, Drifffield YO25 8RL

London Office: 263 Acton Lane, Chiswick, London W4

New machines for Deus



Programmer Andy Stagg with one of Deus ex Machina's 'stars', Ian Dury.

AUTOMATA's *Deus ex Machina* is to be converted for the Commodore 64 and Amstrad CPC464.

The Amstrad conversion is being done by Andrew Stagg, who first programmed *Deus* for the Spectrum. Freelance programmer Colin Jones is working on the Commodore version.

"We are making the scoring system slightly more accessible for the new machine, so that it is easier to finish with a positive score," said Mel Croucher of Automata. "Some of the screens on the Commodore will be slightly more elaborate, but apart from that it will be a

straight conversion."

Deus ex Machina on the Commodore 64 and CPC 464 should be available at the beginning of January, with both versions priced at around £15.

Adventures on a budget

MASTERTRONIC has launched the first of a new series of budget-priced adventure games to retail at just £2.99.

The first releases, under the label Master Adventurer, will be *Se-Kaa of Assiah*, *Black Crystal* and *Volcanic Dungeon*.

The last two have already appeared under the Carnell label. Ex-Carnell heads Roy Carnell and Stuart Galloway are now working for a division of Mastertronic, Mastervision.

"*Volcanic Dungeon* has been substantially rewritten, and graphics added, for its rerelease. *Black Crystal* will be

sold on two cassettes, amounting to 180K of programming altogether," said Mastertronic managing director Martin Alper.

"Stuart Galloway and Roy Carnell will continue to write a number of adventures for the Master Adventurer label.

"We settled on £2.99 as a realistic budget price, because of the relative complexity of adventure programming," Martin continued. "*Black Crystal*, however, will be £3.99, since the package comprises two cassettes."

All titles are available for the Spectrum. *Se-Kaa of Assiah* will also be available for the Commodore 64, and a 64 version of *Black Crystal* should be released in the New Year.

Argus teams with McCartney

ARGUS Press Software is to release a computer game based on the new Paul McCartney film *Give my Regards to Broad Street* in January to coincide with the film's release in this country.

The game will be one of Argus's new Mind Games series, which includes *American*

Football and the recently launched *Alien* (Popular Computing Weekly, October 4).

The film *Give my Regards to Broad Street* is largely the brainchild of Paul McCartney, who directed and stars in it, along with wife Linda, Tracey Ullman, Ringo Starr and Barbara Bach.

"The storyline of the game follows the film quite closely and has been written with Paul's help," said Peter Holme of Argus.

Argus has gained the worldwide rights to the computer game of *Broad Street*, which will initially be released for the Commodore 64 and the Atari at £6.95. Argus is also considering a Spectrum version.

SIMPLY CHEAPEST SOFTWARE CHECK THESE PRICES

OUR		OUR		OUR		OUR	
SPECTRUM	RRP PRICE	SPECTRUM	RRP PRICE	COMMODORE	RRP PRICE	COMMODORE	RRP PRICE
EUREKA	14.95 10.99	DALEY'S DECATH	6.90 5.20	GHOSTBUSTERS	10.99 8.25	KOKO TONI WILF	6.95 5.24
BACKPACKERS	7.50 5.55	ALL ULTIMATE GAMES	9.95 7.36	RIAD OVER		BOYLDER DASH	8.95 6.64
SKOOL DAZE	5.95 4.45	LOAD RUNNER	9.95 7.36	MOSCOW	9.95 7.36	VALHALLA	14.95 10.99
FALL GUYS	6.95 5.05	AVALON	7.95 5.94	SUICIDE EXPRESS	7.95 6.25	FALCON PATROL II	7.95 6.45
TIR NA NOG	9.95 6.88	ZOMBIE ZOMBIE	6.95 5.21	DRELBS	9.95 7.36	PYJAMAAMA	7.95 6.25
BRAX BLUFF	6.95 5.21	TWIN KINGDOM VALLEY	7.95 5.88	QUO VADIS	9.95 7.36	THEUSTA	5.95 4.55
DANGER MOUSE	6.95 5.21	DARK STAR	7.50 5.61	JET SET WILLY	7.95 5.74		
STRANGE LOOP	5.95 5.12	MATCH POINT	7.95 5.93	FLAK	9.95 7.36		
EDDIE KIDD JUMP		SPORTS HERO	6.95 5.21	WING COMMANDER	7.95 5.95		
CHALL.	6.95 5.21	PSYTRON	7.95 5.93	FORT APOCALYPSE	9.95 7.36		
JASPER	6.95 5.21	TORNADO LOW LEVEL	5.95 4.50	SPITFIRE ACE	9.95 7.36		
PYJAMARAMA	6.95 5.21	DEUS EX MACHINA	15.00 11.00	ZAXXON	9.95 7.36		
ALL LEVELS 9 GAMES	9.95 7.36	START BIKE	6.95 5.05	DANGER MOUSE	7.50 5.95		
GIANTS REVENGE	6.95 5.21	KUNG FU	6.95 5.05	STRIP POKER	9.95 7.36		
KOKO TONI WILF	5.95 4.50	HYPER ACTION	5.95 4.55	BRUCE LEE	14.95 10.69		
BEACH HEAD	7.95 5.90			SUMMER GAMES	14.95 10.94		

ALL TAPES GUARANTEED GENUINE: FIRST CLASS DELIVERY SAME DAY AS ORDER RECEIVED
P.&P. INC. IN PRICE UK: 75p PER TAPE EUROPE: £1 PER TAPE ELSEWHERE

SEND LARGE SAE FOR FULL LIST (state machine)

WHEN ORDERING SEND CHEQUE/P.O. TO:

BARGAIN SOFTWARE

10 MELODY COURT, STONE ROAD ESTATE, LONDON W4 3AW

TEL: (01) 995 2763

Left hooks

Your observation on the size of our CP/M (*Popular Computing Weekly* Vol 3 No 46) might be tempered by consideration of the following points.

A 64K CP/M would not allow as much space to Basic as does the approach adopted by our disc system.

The price of CP/M software is classically £250 per module for things like integrated accounts, databases and the like. We offer these (with no loss of function) at £30-50.

All the hooks are present in the system design to permit some enterprising soul to devise an MSDOS 512K add-on if they so desire — but then it might not cost £199 and offer dual operating systems and be bundled with *Dr Logo*, might it?

William Poel

Amsoft

Brentwood House

169 Kings Road

Brentwood

Essex

More ways to run than one

I've found something interesting on the Commodore 64. If you plug a joystick into Port 2, hold in the fire button and press 'N', it displays *Load Press Play on Tape*, the equivalent of *Shift/RunStop*.

Paul Valentino

87 Merriman Road

Blackheath

London SE3

Version therapy

I was most surprised to read the comments of Graham Taylor in his review of *Fighter Pilot* in this week's *Popular Computing Weekly*. His references to the "superior facilities" of the 64 must surely be in the context of sprite-oriented arcade games.

For Mr Taylor's information, the 6502 processor in the CBM64 is far inferior to the Z80 (Spectrum) when extensive high-speed 16-bit mathematics is involved, eg, 3D co-ordinate geometry, aircraft flight cha-

racteristics, etc.

Retaining all the features of the Spectrum version demanded considerable enhancements to the algorithms used, and to achieve such a faithful conversion is a credit to the programmer.

With regards to the comments "less impressive" and "disappointing", this view is not shared by the many distributors and customers who have patiently waited for *Fighter Pilot* 64.

DK Marshall

Digital Integration

Watchmoor Trade Centre

Watchmoor Rd

Camberley

Surrey

We still feel that the Spectrum version of *Fighter Pilot* is better than the Commodore one.

Dragon lives on

As the proud owner of a Dragon 32 computer which has had more than its fair share of what I would call 'non-support', I would like to know if you are going to support the Dragon more than you have done in the past few weeks.

Even though the so-called 'professional' people and some software houses don't like it, hundreds of owners do, and would like more of the good information you have published in the past.

MP Baker

5 South Close

Bury St Edmunds

Suffolk

You have no need to fear. We will continue to support the green-screen beast as long as there are enough readers who want us to do so!



Checkmate chess test

Here is a little challenge for your chess playing readers. How good do you think your computer chess program is? How many moves can it see ahead? Can it solve mate in two moves problems? Perhaps



you'd like to try it out on this one: give the computer a king and both rooks. Give yourself a lone king. Can it checkmate you?

John Rundle

26 Western Road

Aldershot

Hants GU11 3PL

PS If any reader sends me an SAE plus a 20p coin I will send them 12 diagrammed chess position problems with solutions.

Software libraries

I was surprised to read Phil Roger's comments in *Peek & Poke*, in the October 17 issue, with regard to Software Libraries: "I must confess that I get a little uneasy when I see adverts for the software hire companies — if an individual attempted to do this he would probably be threatened with dire punishments."

It would seem that to Phil, software libraries might verge on the illegal. While appreciating his concern, libraries do provide an excellent opportunity for computer owners to sample a great variety of programs. How many times has a superficial two minutes snatched in a shop prompted you to buy, only to find after an hour's play at home that the money was wasted? We find to a large extent that after hiring tapes members purchase them.

One other point is that all our Spectrum and Commodore

titles are hired only with the supplier's permission and most magazines, including PCW, will only accept advertisements from companies who state this.

Peter Johnson

Director

Softenk

122 South Circular Road

Dublin 8

Eire

Thank you Sinclair

As the liaison officer for PHAB (Physically Handicapped and Able Bodied) in the Derby area I have recently been trying to start a computer course for the physically handicapped within the Derby area, as I feel that in the near future a large amount of office work could be done from the home, by disabled people, via a computer network.

In my search for computer equipment I contacted Sinclair Research and would like to thank them through your magazine for their kind donation of a 48K ZX Spectrum.

CD Thompson

101 Princes St

Derby

DE3 8NS

Spoilt for choice

Re your November 15 issue containing the Amstrad top ten games list, compiled by Boots.

This indication of the most popular games of the CP464 is totally misleading, as in Bristol at least, of well over 80 games available for the machine, Boots have only ever stocked half a dozen.

Three days ago they had *Roland on the Ropes*, *Roland Goes Digging*, *Graf Spey*, and *Hunter Killer* — exactly four titles.

The Amstrad is not even advertised in the store although the Spectrum and Commodore C16 are — the shop had no joysticks, printer, and no plans to stock the disc drive and had "no idea what software, if any, is on order."

PJ Long

3 Victoria Place

Bedminster

Bristol

Ingenious...

THE COMPUTER EDITION OF



presents

THE COMPUTER EDITION OF

Waddingtons

MONOPOLY

Registered Trade Mark of Waddingtons Games Ltd.

MONOPOLY

Registered Trade Mark of Waddingtons Games Ltd.

PROPERTY TRADING GAME



Registered Trade Mark of Waddingtons Games Ltd.

For the
Commodore 64

Software by...

**Leisure
Genius**



3 Montagu Row, London W1H 1AB

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

(®) REGISTERED TRADE MARK

Astro-Link

A steady hand and nerves of steel are needed to complete the testing task set for Commodore 64 users by Laurence Beattie

In this game you must guide your ship off the surface of a planet and through an asteroid belt, in an attempt to dock with an orbiting mothership.

On docking — this isn't easy — you move to a harder screen with a greater number of asteroids. The quicker you complete your mission, the more points you will be awarded.

The ship is controlled by joystick, which accelerates your craft in any direction, and there is a constant gravitational pull towards the planet that you must overcome.

The program is well documented with Rem statements.

Program Notes

Variables

HP	—	High score
SC	—	Screen Number
PO	—	Score
vu	—	Vertical velocity
vr	—	Horizontal velocity
MX	—	Horizontal position of mothership
T1	—	Start time
T2	—	Finish time
JS	—	Position of joystick




```

1 REM**** ASTRO ****
2 REM**** BY L.BEATTIE ****
3 REM**** ****
4 HP=0
5 PRINT "J":PO=0:SC=0:POKE646,1
6 POKE54276,0:POKE54272,255:POKE54273,10
7 POKE54277,16:POKE54278,240:POKE54279,15
REM****SET UP SOUND***
10 POKE53280,12:POKE53281,0:POKE53282,12:
POKE53286,15:REM****SCREEN COLOURS***
20 FORX=53287TO53294:POKEX,11:NEXT
REM****SPRITE COLOURS***
25 FORX=12992TO13248:READY:POKEX,V:NEXT
REM****SPRITE DATA***
30 FORX=2040TO2045:POKEX,200:NEXT:POKE2046,205:
POKE2047,204:REM****SPRITE POINTERS
40 POKE53276,255:REM****MULTICOLOUR***
41 T1=TIME
42 REM****NEXT SCREEN***
43 VU=0:VR=0:V=200:MX=INT(RND(1)*200)+24
47 PRINT "J":FORX=0TO18:S=INT(RND(1)*40):
PRINTTAB(S);".":NEXT
50 FORX=53248TO53258STEP2:POKEX,2*INT(RND(1)
*126)):NEXT:POKE53262,160:REM***X
60 FORX=53259TO53249STEP-2:POKEX,
(254-(53261-X)/2)+25:NEXT:POKE53263,200:REM Y
63 REM TEST:POKE53269,255:REM TAB:OUT
70 POKE53269,192:FORX=0TO9:SCREEN=POKE53269,
PEEK(53269)+(2*X):NEXTX
71 X=PEEK(53278):POKE53264,0
79:
80 REM****MAIN LOOP***
82:
90 REM****MOTHERSHIP***
92 MX=MX+1
93 IFMX=96AND(PEEK(53264)AND64)=64:POKE53264,
PEEK(53264)-64:MX=0:GOTO95
94 IFMX=256THENMX=0:POKE53264,PEEK(53264)+64
95 POKE53260,MX:POKE53261,50
99 REM****ASTEROIDS***
100 FORX=53248TO53258STEP4
101 IFPEEK(X)<254THENPOKEX,PEEK(X)+2:
IFPEEK(X)>85THEN110
103 IFPEEK(X)=85THENPOKEX,0:POKE53264,
PEEK(53264)-2*((X-53248)/2):GOTO110
105 POKEX,1:POKE53264,
(PEEK(53264)+1+((X-53248)/2))
107 REM****NEXT ASTEROID***
110 IFPEEK(X+2)>1THENPOKE(X+2),PEEK(X+2)+2:
IFPEEK(X+2)<1THEN120
111 IFPEEK(X+2)=1THENPOKE(X+2),254:POKE53264,
PEEK(53264)-2*((X+53246)/2):GOTO120
115 IFPEEK(X+2)=0THENPOKE(X+2),85:POKE53264,
PEEK(53264)+2*((X-53246)/2)
120 NEXTX:REM****NEXT ASTEROID***
130 GOSUB700:IFX=0THENS
135 IFX=1THEN45
140 REM****SHIP MOVEMENT***
145 JS=15-(PEEK(56321)AND15)
IFJS<0THENPOKE54276,129
150 ON(JS+1)GOSUB340,350,360,340,370,380,390,
340,400,410,420
155 GOTO430
160 POKE54276,128:RETURN
165 VU=VU-2:RETURN
170 VU=VU+2:RETURN
175 VR=VR-1:RETURN
180 VU=VU-2:VR=VR-1:RETURN
185 VU=VU+2:VR=VR-1:RETURN
190 VR=VR+1:RETURN
195 VU=VU-2:VR=VR+1:RETURN
200 VU=VU+2:VR=VR+1:RETURN
205 IFPEEK(53263)<200THENVU=VU+1:REM GRAVITY
210 REM****LEFT+ RIGHT LIMITS***
215 H=PEEK(53262)+VR
220 IFH<0ANDPEEK(53264)>127THENPOKE53264,
PEEK(53264)-128:H=255+H:GOTO470
225 IFH<21ANDPEEK(53264)<128THENH=21:
VR=0:GOTO470
443 IFH>255ANDPEEK(53264)<128THENH=H-255:
POKE53264,PEEK(53264)+128:GOTO470
447 IFH>46ANDPEEK(53264)>127THENH=46:VR=0
470 REM****TOP + BOTTOM LIMITS***
475 V=PEEK(53263)+VU
476 IFV<30THENV=30:VU=0
477 IFV>200THENV=200:VU=0
500 POKE53262,H:POKE53263,V
510 GOSUB700:IFX=0THENS
512 IFX=1THEN45
520 T2=TIME:PRINT"TIME : ";INT((T2-T1)/60):
PRINT"J":GOTO92
700 REM****COLLISION?***
705 X=PEEK(53278)
710 IFX=0ORX=96THENX=2:RETURN
720 IFX=192ANDPEEK(53260)=PEEK(53262)
THENPOKE53263,PEEK(53261)+21:GOTO730
722 POKE54273,4:POKE54276,0:POKE54273,255:
POKE54276,129
725 POKE53294,2:FORX=1TO100:POKE2047,206:
POKE2047,204:NEXT
726 POKE53269,PEEK(53269)-128:POKE54278,255:
POKE54276,128:GOTO740
730 POKE54276,17:PO=PO+50/((T2-T1)/60)+50*5
735 SCREEN=SCREEN+1:IFSCREEN<6THENSTORE X=1:
RETURN
740 POKE646,4:PRINT:PRINT"TI/OU SCORED ";
INT(PO*100);" POINTS":FORX=1TO3500:NEXT
745 REM****FIRE TO START***
746 POKE646,4
750 POKE53269,0:POKE53280,11:PRINT
"*****PRESS FIRE TO START"
751 POKE646,7:POKE53281,0:PRINT:
PRINT"*****LAST SCORE :";INT(PO*100):
752 IFINT(PO*100)>HP THENHP=INT(PO*100)
753 PRINTTAB(20)"HIGH SCORE:";HP
754 IFSCREEN=6THENPRINT"*****
CONGRATULATIONS : ALL CRAFT DOCKED."
755 X=45:Y=20:POKE53264,0:POKE53260,1:
POKE53271,1:POKE53277,1
760 IF(PEEK(56321)AND16)<0THEN780
770 POKE53277,0:POKE53271,0:POKE53260,0:
RESTORE X=0:RETURN
780 X=X+1:Y=Y+1:IFY=230THEN755
785 POKE53248,X:POKE53249,Y:GOTO760
996:
997:
998 REM**** DATA ***
999 REM****ASTEROID***
1000 DATA0,0,0,0,5,0,0,9,64,2,31,0,0,95,220,2,
85,223,10,95,219,38,111,220
1001 DATA43,86,223,153,87,251,154,151,244,41,
119,156,42,193,223,10,151,247,42
1002 DATA213,181,42,149,231,10,169,34,2,149,64,
0,21,64,0,6,64,0,5,0,0
1003 REM****SHIP***
1004 DATA0,36,0,0,36,0,0,167,0,0,151,0,2,170,
128,2,151,192,2,151,192,2,151,192
1005 DATA2,151,192,2,151,192,2,151,192,2,151,
192,2,151,192,2,151,192,2,151,192
1006 DATA2,151,192,0,44,0,0,44,0,0,167,0,2,151,
192,2,151,192,0
1007 REM****MOTHERSHIP***
1008 DATA2,151,192,2,151,192,0,167,0,0,44,0,0,
44,0,2,151,192,2,151,192,2,151,192
1009 DATA2,151,192,2,151,192,2,151,192,2,151,
192,2,151,192,2,151,192,2,151,192
1010 DATA2,151,192,2,170,128,0,151,0,0,167,0,0,
36,0,0,36,0,0
1011 REM****CRASH***
1012 DATA8,0,0,0,140,0,0,0,0,3,28,0,50,133,192,
0,148,12,48,205,192,0,55,112
1013 DATA4,255,198,51,193,0,48,255,204,3,55,64,
0,236,199,128,165,64,12,167,64
1014 DATA0,165,112,32,229,72,12,173,112,0,37,0,
0,165,68,2,173,80,0,0

```


Celtic rangers

John Cook delves into Celtic myth with Gargoyle Games

It never rains in Southern California, but 5000 miles away in Dudley it does; in fact it buckets down incessantly with a vengeance. However, this West Midlands town, complete with ruined castle and zoological gardens (both world famous in Dudley, according to Jasper Carrot) may soon become a place of pilgrimage for computer adventurers, as it is the home of Gargoyle Games, producer of *Tir Na Nog*, arguably one of the top ten Spectrum games this year — certainly in quality and, if there is any justice in this world, sales too.

Gargoyle Games is not a household name. They are not an offshoot of a megacorporation nor are they your common or garden teenage geniuses who, whilst taking a break from unified field theory at university, taught themselves Z80 machine code and BMX racing. The truth is quite different.

In fact, Gargoyle was formed less than a year ago, by two colleagues, Greg Follis and Roy Carter, who, after a combined total of almost 30 years experience in commercial programming techniques, decided to write games for home computers.

Gargoyle needed some marketing expertise so Greg and Roy enlisted an old friend, Ted Heathcote, whose experience, surprisingly enough, was in running a clothing business. "Menswear is really very similar to software," he told me, and while I have yet to be seen sporting matching cassette box and tie, *Tir Na Nog* seems to be doing well under his guidance.

I asked the others a little about their computing backgrounds, neither providing the expected answers. Greg shrugged, "Well, after getting chucked out of Art School I did loads of jobs, and seemed to end up in computers." Roy continued, "I was working as a computer operator in a company, and the programmer left. I think they took me on because I was cheap!"

Gargoyle's first release, in April of this year, was *Ad Astra*, an entertaining little space wars shoot-em-up. Whilst this program was never going to change the world,

it attracted something of a cult following, and was successful enough to encourage them to invest further time and effort in the next program, which turned out to be TNN.

For the uninitiated, *Tir Na Nog* is based on the exploits of a Celtic hero, Cuchulainn, and his deeds in the ancient otherworld *Tir Na Nog*, which means 'Land of Youth', his task being to unite the four parts of the Seal of Calum. The game oozes class, with outstanding graphic animation, enigmatic puzzles and a genuine atmosphere of mystery and adventure.

Greg, who designed TNN, told me something about the original idea. "The Celtic myths have a great feel to them," he commented, "and no-one has covered them before."

The program comes with a booklet containing extracts from the *Leabhar Glaoch*, the Book of Tears, which are themselves very evocative. Greg looked a bit sheepish. "We wrote those extracts ourselves," he admitted. "There is in fact no such book... but it's a bit difficult to tell that to someone who's just spent hours in a library looking for it."

Perhaps the most striking feature of the game, initially, is the animation of the central character. Cuchulainn strolls around, hair waving behind him, in a most convincing fashion. How is it done? "The scrolling is done off-screen, then put on screen, phased between interrupts," explained Roy. Likewise the many frames for Cuchulainn, using a mask and overlay so you can't see through him. Using the mask only has the effect of making him look invisible... which is essential for completing the main quest.

I asked how long it took, real-time, to complete the game. "Don't ask me... I keep getting lost," said Roy... this may explain why it is he who does most of the actual programming. "In the final phase of testing though, Greg went through the whole quest, and it took him six hours." That's with knowing where everything is and what everything does! Bearing this in mind, they expect months to pass before a correct

solution is found...

TNN is certainly big, but how big? Greg grinned. "About 3000 miles worth of road," he answered, "but to store it as pure map would take up far too much memory, so what we do is store a template of the area, and specify the appropriate alterations as you move along."



I've been having a little trouble with TNN so I ventured a few specific questions of my own, like how do you 'kill' Sidhe. "You must carry at least two weapons, and thrust with one of them," came the answer.

Also, what does the face in the Hunters' Cave actually say? Certainly not what is shown printed on screen. Gargoyle Games collectively smirked. "You'll have to work that one out for yourself," I was told. Lip readers drop me a line. "We're thinking of producing a screen sized animation synchronised with a sound output so it talks to you," continued Greg. "It links in with some of the research we've done on Artificial Intelligence...it would be programmed to argue with you." That's for the future though, what's coming up next?

"There's the Commodore 64 version of TNN; that should be coming out after Christmas; we're also considering an Amstrad conversion. Then there's the prequel to TNN, set in the land of the living — this time in a city. This will limit the size of the game, so we have more space for animations...which we think we are getting pretty good at." After that? "We're trying to develop a game on *The Hunting of the Snark*, by Lewis Carroll, if we can get the rights. It'll be a three times removed lateral thinking adventure," he added with relish.

"What we are trying to do is to make games where you can create your own sub-plots within the adventure," remarked Roy. "We've had phone calls from people that have hidden items within the game, save it, then challenge their friends to find them." "As if the original wasn't hard enough."

Further into the future, the team intends to move into small business software, albeit under a different name. "I think the arrival of home micros has removed the fear from computers," said Greg. "In five years time, all the kids who are using computers at school now will be at work, and in business. There's a lack of the kind of good software for small companies, so we aim to write it."

You know, if Gargoyle keep this up, the castle and the zoo are in for some pretty heavy competition in Dudley.



tír na nòg



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

Addition

Hardware Amstrad DDI-1 Disc Drive **Price** £199.99 **Supplier** Amstrad Consumer Electronics.

With the launch of its DDI-1 disc drive unit for the CPC 464 machine Amstrad is now offering the cheapest CP/M computer available; controversy may surround precisely how 'standard' the system is (it bears the Digital Research stamp, version 2.2), and some people may be overawed with the idea of such an operating system taking over their home computer.

Fortunately, though, you can view CP/M as "icing on the cake". The disc system comes in two parts, drive and interface. The disc drive itself is housed in a box that also contains a mains power supply; it is rather long, but nevertheless compact. The drive itself is of the 3inch Hitachi/Panasonic format, using fully enclosed discs. In operation the drive is both fast and quiet, with a good solid response when load-

operating system Rom is 7, so when the firmware sets up the system it initialises the DOS but returns control to Basic. By cutting a wire link inside the interface it is possible to make the DOS's Rom become number 0, which means the computer will power up in CP/MN. But I am getting ahead of myself — the first thing people do with their new disc drive will not be to delve inside and start hacking away at the circuit-board.

How does the system work in normal use?

It operates in two basic modes — Amstrad, the Amstrad disc operating system — and under CP/M.

When you first attach the disc drive and interface there is no immediately obvious change; the computer powers

on to disc. To provide the RSX calls and give Amstrad work-space, some Ram needs to be borrowed from the computer; it appears that just over 1K is lost to Basic. The extra routines associated with the DOS are vectored through Ram jump-blocks, and these are documented in an appendix to the firmware manual.

So far, very good. The disc drive provides a storage method about 50 times faster than cassettes, and automatically makes back-up files when files are closed (it renames the old file with a *Bak* suffix and deletes any other back-up). Each side of a disc's 40 tracks holds 180K, of which the directory occupies 2K.

With CP/M, however, 9K is lost to the system, and there are two other formats possible. Vendor format leaves space for CP/M information, to avoid you selling the property of Digital Research (who employ some very good lawyers!). IBM format allows discs produced on an IBM PC with CP/M 86 and 3inch disc drive to be read by the CPC 464 and vice-versa. This last option gives 154K capacity.

What delights await when the *|CPM* command is used? Assuming a system disc is in place, some data is loaded, the screen changes colour and the screen notifies that we are in CP/M. A *Dir* command will show that

the system disc provides not only the 'standard' utility programs, such as *ED*, *MovCPM*, *Pip*, *Asm* and *Ddt* (these last are an 8080 assembler and de-bugger respectively) but a number of Amstrad additional commands such as

Cload and *Csave* (tape/disc transfer), *Disc-copy*, *SetUp* and *Amstrad*.

There are two restrictions placed on any CP/M programs you might wish to run—other than the fact that they need to be on 3inch disc. As the CPC 464 firmware uses all of the Z80's restarts but RST 6, this is the only restart that is available to CP/M. DDT, for example, normally uses RST 7: so the Amstrad version has to be patched to use 6. Other programs may also have to be patched to use *Rst6*.

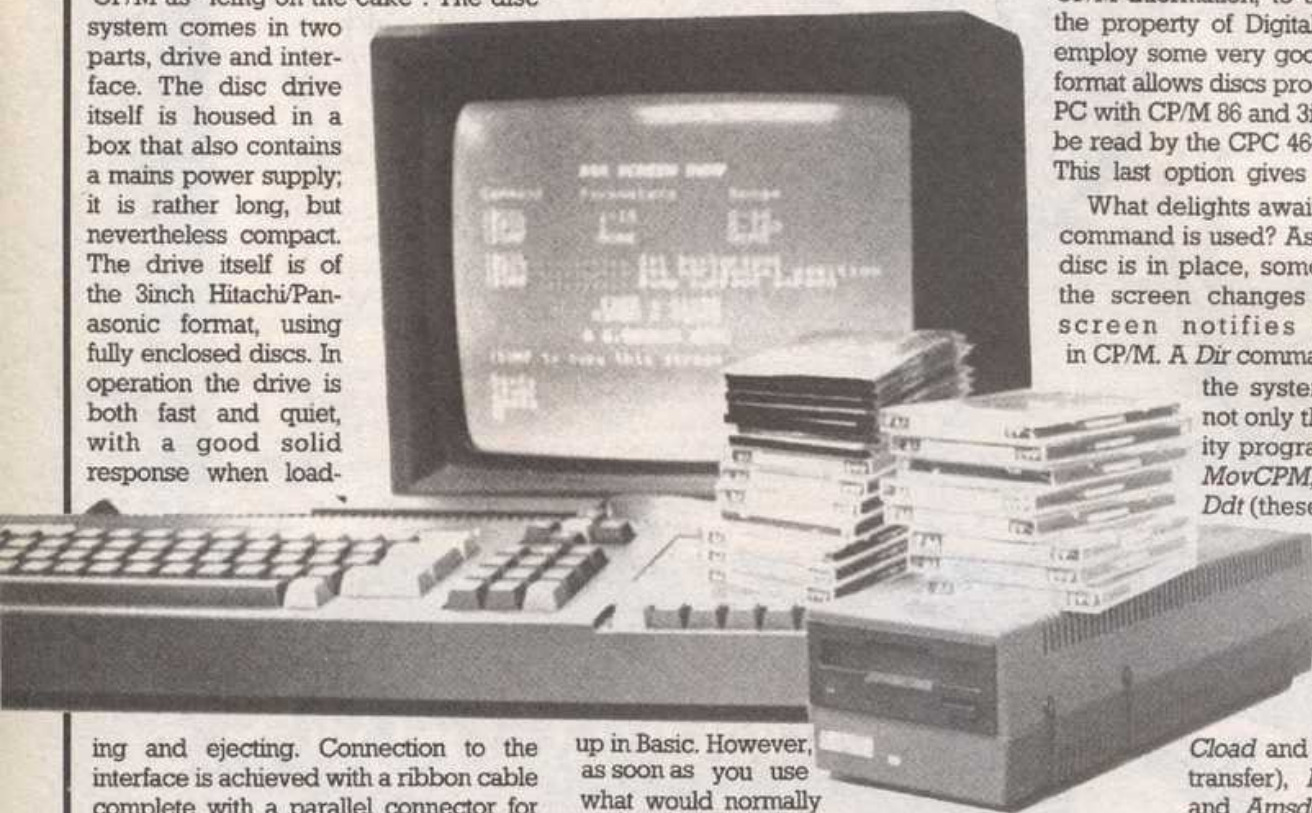
The other is the contentious matter of the size of the transient program area—how big a program can be run in Ram? Most CP/M systems allow about 56K for programs to use, but as 16K of the CPC

ing and ejecting. Connection to the interface is achieved with a ribbon cable complete with a parallel connector for plugging in a second drive. Two disc units is the most that the system can handle. The interface plugs onto the exposed edge connector at the rear of the CPC 464. This arrangement is not particularly stable, (remember the ZX81 Ram pack wobble?), but gold-plated connectors are used. The interface itself contains a floppy disc controller chip (uPD765A) and a 16K 'sideways' Rom that occupies addresses &C000 to &FFFF. This puts it in competition with not only the screen Ram but also the Basic interpreter.

The CPC 464 runs the Rom with the lowest number as the foreground program. Basic is Number 1, while the disc

up in Basic. However, as soon as you use what would normally be a cassette command, it is the disc rather than the cassette that responds. Stream 9 has been re-routed and the firmware jump-blocks are overwritten during power-up.

Amstrad, as this level of operation is called, also adds a number of extension commands to Basic, provided by the resident systems extensions (RSX) and therefore preceded by a bar symbol. It is possible to select the default drive, erase and rename files, and switch back to cassette operation, either for reading, writing, or both. Issuing the commands */TAPE.IN* and */DISC.OUT*, for example, will result in a *Load* operation fetching a program from tape and a *Save* putting it



464's memory is used for screen display, it is not surprising that there is only 39.5K available to run programs in Rom. This is not as serious a drawback as it might seem — the whole point of CP/M is that portions of program and most of the data is held on disc and overlayed into Ram when required. Some programs will need to be altered, which, while not a layman's job, should not be a major task.

I have seen such items as Microsoft Basic and Wordstar running on the

Amstrad without patching, but these both cost more than the computer so who would want to run them anyway?

Amsoft expect to provide a number of CP/M programs fully compatible and tested with the CPC 464, at affordable prices. The first examples will be Quests' ABC accounts package (£99 for the three basic modules, instead of a claimed £750 for other CP/M machines) and the Microscript/pen/spread word processing, database and spreadsheet pro-

grams at £50 each.

If you want anything else, Amsoft will put you in touch with a company that can 'port' across any CP/M program at retail prices — Timatic Systems of Newgate Lane, Fareham, Hants.

What must not be forgotten is that, even without CP/M, the disc system for the Amstrad CPC 464 would still be a very worthwhile addition — add CP/M and you have much more than just icing on the cake.

Jeff Naylor

Bass pattern

Hardware Commodore Music Maker Micro Commodore 64 Price £29.95 Supplier Commodore.

At around £30, the Commodore Music Maker is priced low enough to encourage those who've previously been wary of forking out for music peripherals for their 64s to do so. It is also clearly aimed at the user who might be thinking of buying a small Casiotone or similar home organ.

The package has been produced for Commodore by Music Sales — a company previously best-known for its vast range of play-in-a-day songbooks featuring everybody from Abba to ZZ Top.

Music Maker comes with its own mini-songbook containing such gems as *Chopsticks*, *Jingle Bells* and *Sailing* arranged for the simple, rather tacky plastic 'overlay'

keyboard also provided as part of the package.

This plastic keyboard — in Commodore co-ordinated colours — clips over the computer keyboard, allowing you to feel a little bit like you're a proper synth while you're actually hitting QWERTY keys. A clever idea, although one that would have benefited from more thoughtful design.

The software, available either on disc or cassette, is not unimpressive. On loading you are right into the program and can immediately tap out a tune on the keyboard. A menu offers you the options of selecting one of eight voices, changing octaves — two octaves are available at any one time,

altering voice envelopes and filter characteristics, playing in poly-mode (up to three notes played simultaneously), selecting one of three preset rhythms and altering them by changing or removing the bass pattern and, finally, sequencing (with a Save and Load option).

All this sounds impressive, but the facilities offered are, in fact, small considering the full potential of the 64's SID sound chip.

The sequencer, for example, holds a maximum of only 256 notes and does not allow poly-mode or even 'overdubbing' (playing one track to the accompaniment of an already sequenced one).

That said, the system does have some nice features — the slide effect, the tuning facility and the ability to tap out different rhythms for a single sequence particularly caught my fancy.

The inclusion of the simple mechanical music keyboard overlay is only really warranted to give the system more 'instant' appeal.

If you don't need the illusion of a music keyboard and are quite content to use the C64's Qwerty keyboard then I would recommend in preference Supersoft's *Music Master* which costs slightly less than £30, or Waveform's *MusiCalc* which costs somewhat more.

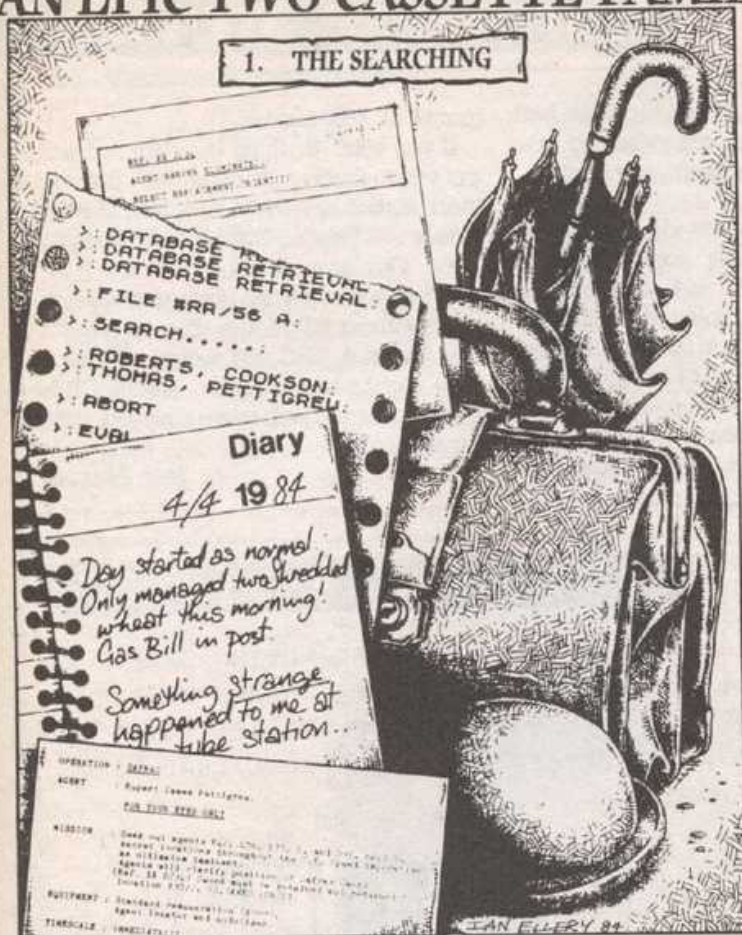
Gary Herman



SHARDS SOFTWARE PRESENTS

AN EPIC TWO CASSETTE FAMILY ADVENTURE IN FOUR PARTS

1. THE SEARCHING



2. THE RETURNING



THE PETTIGREW CHRONICLES

3. THE DISCOVERY



4. THE CONCLUSION



Selected Stores

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

Supreme

Program *Knight Lore* **Price** £9.95 **Micro** Spectrum **Supplier** Ultimate Play the Game, The Green, Ashby de la Zouch, Leics.

There are many, many reasons for choosing an XYZ computer in favour of a CDE, for going home grown, American, or even turning Japanese. My opinion, for what it's worth, is simple: the Spectrum is the only micro I know where the quality and amount of software available is

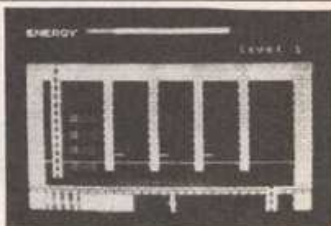
at any of five locations you have to negotiate the hazards of the castle whilst collecting items that litter the rooms. Each room is viewed in 3-D from a top corner and the graphic design is wonderful. Each room is filled with a variety of problems to overcome.

Time elapses according to a sun/moon display towards the bottom of the screen and when the moon appears you make a quirky transformation into a fairly cute werewolf and back to Swordsman during the day.

The most impressive aspect of *Knight Lore* is not only the sheer fun of playing, but the obvious care and intelligence

feature — instead of leaping over objects you can cling to one of two pipes above your head — timing is less crucial, but hanging around uses up energy and gives you a lower score. If you are hit by the boxes, from above, you are flattened, while the rolling barrels knock you head over heels, which is neat.

This is not enough, though, to disguise what is a rather boring game. Sound is reasonable but the graphics are characterless, apart from your little figure's victory dance when a successful crossing of the warehouse floor is made. More objects and the appearance of pur-

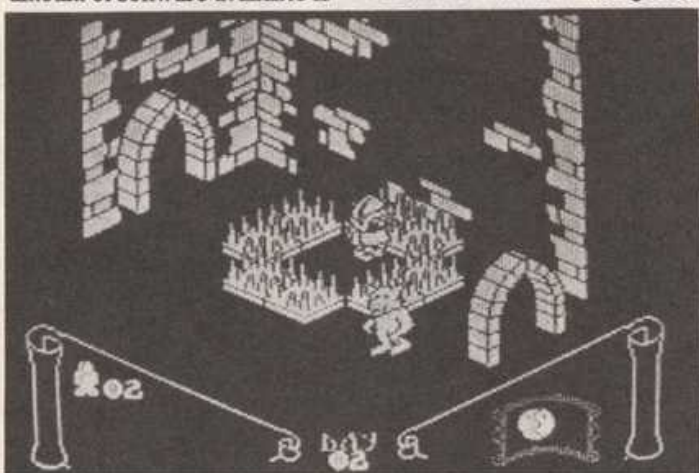


suing ghosts add to the difficulty but don't really contribute much variation.

At an ultra bargain price this might have been acceptable, but this is mid-price.

Bewarehouse is a good name — it deserved a better game.

John Minson



high enough to make it worth purchasing for that reason alone. *Manic Miner* and *Lords of Midnight* are two examples. We now have another.

Knight Lore from Ultimate is the most technically supreme game that I have ever played. It is a hideously addictive and compelling arcade/adventure and certainly the first program that comes close to merging the two genres.

The scenario is a direct sequel to *Sabre Wulf*; as 'Our Hero', you have been bitten by the werewolf and are suffering mighty transformations. One such has dumped you in a 128 room (I've found 111) castle wherein lives a malevolent wizard with his cauldron. Starting

with which it was written. How to defeat attribute problems? Only use two colours (this actually adds to the atmosphere of the game and makes mapping far easier — there are green, purple, yellow and blue rooms). Also the objects collected can be used to solve not only the objects of the game (making a potion to cure the werewolf's curse, but to assist in some of the arcade section).

It is impossible to give more than the merest hint of what is involved in *Knight Lore* and all I can suggest is that you buy a copy (and a Spectrum if necessary) as quickly as possible.

Gordon Sneddon



Hang around

Program *Bewarehouse* **Micro** Spectrum 48K **Price** £4.95 **Supplier** Positive Image Software, are you enter the *Bewarehouse*? It sounds like a line from a Spiel-

berg movie poster, and the setting of a haunted warehouse holds similar promise. But the instructions foretell of greater horrors — 'Left', 'Right', 'Jump' and 'Super Jump'.

Is it? Can it be? Yes — it's another dodge the barrels, boxes and/or ghosts game.

It does contain one unusual

Hard rock

Program *Boulder Dash* **Price** £8.95 **Micro** Commodore 64 **Supplier** State Soft, Business and Technology Centre, Bessemer Drive, Stevenage, Herts.

The popularity of maze games continues unabated. *Boulder Dash* is one of the most fascinating. The objective is to tunnel your way round a series of caves collecting as many jewels as you can on your way. As you dig through the ground you have to be careful, since if you under-

mine any boulders they will fall until they hit something solid, ie, you, if you're underneath. Deadly fireflies and butterflies in the caves will also destroy you given half a chance. If you can avoid all the hazards, then, dripping with jewellery, you can move on to the next cave.

Each cave covers several scrolling screens, and the later ones are increasingly difficult. The action demands not only fast reaction speeds, but also careful planning.

Thoroughly addictive.

Richard Corfield



Hell-bound

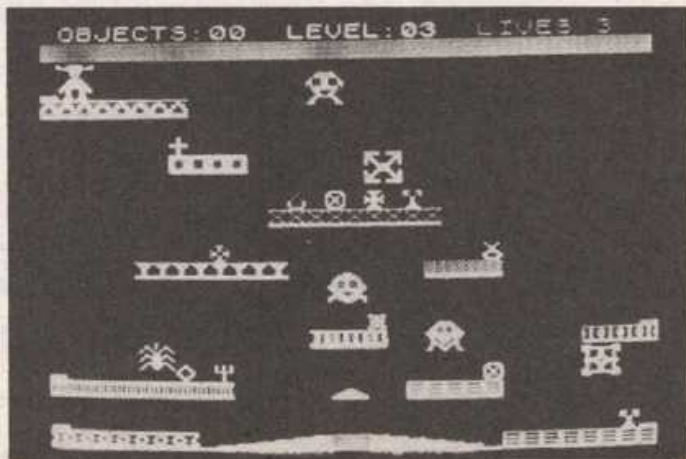
Program *Beebul* **Micro** Spectrum 48K **Price** £1.99 **Supplier** Scorpio Gamesworld, 307-313 Corn Exchange, Manchester

Beebul has virtually only two controls — to move 'Left' and to move 'Right'

and it's none the worse for that.

It's a platform game, but instead of climbing and jumping and slide sideways and drop from level to level.

Your aim, as you descend through Hell, is to collect various treasures. There are more of these than you can collect on one descent, so a teleport is thoughtfully provided to return you to the top to



come down again by another route.

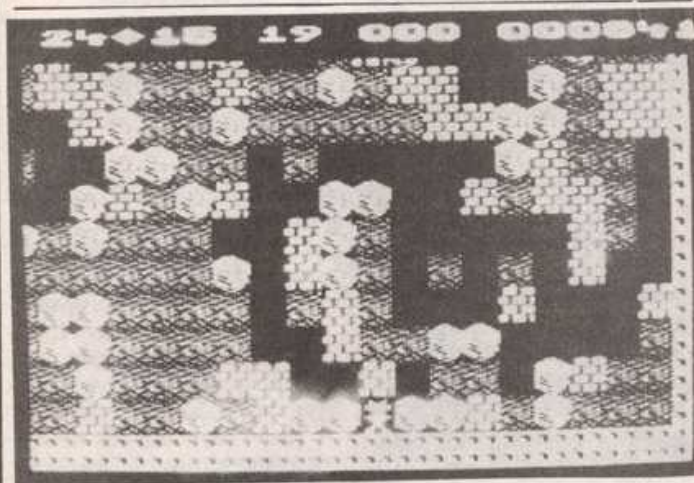
This being Hell, there are also assorted bouncing nasties, and dodging them calls for very careful timing. As you can approach several treasures from either side, and collecting the last one immediately transfers you to the next screen, a bit of strategy is called for too.

Beebul is not the most sophisticated game you will find on the shelves, but it is far from

the worst. Its monsters have character, it moves smoothly and pixel accuracy is possible without the premature death syndrome that bugs some slay-happy sprite games.

At this price it is worth having and makes you wonder how some software houses can justify far higher prices for less enjoyable games.

John Minson



In the dark

Program Bristles Price £8.95 Micro Commodore 64 **Supplier** State Soft, Business and Technology Centre, Bessemer Drive, Stevenage, Herts

Interior decorating gets the micro treatment in *Bristles*, a US production by First Star, marketed in the UK by State Soft. The houses you are contracted to repaint in the cause of the game seem to have been invaded by poltergeists, since you have to spend some of your limited time dodging various flying paint pots and wandering paint buckets. Additionally, there is a nuisance called Brenda the Brat who has the annoying habit of sticking

her handprints on your freshly painted walls, which you then have to repaint. Brenda, however, will keep her hands to herself for a while, if you bribe her with sweets.

Six skill levels make up the game. At level one you use normal paint in good light. In later stages you have to paint with clear varnish which means that you cannot see which rooms have been completed. Later still, you have to work in the dark, so that you cannot even see the rooms let alone tell whether or not they are painted!

The game gave me a lot of fun, and presents quite a challenge.

Richard Corfield



Souped-up

Program Overdrive Micro Electron **Price £7.95** **Supplier** Superior Software Ltd., Regent House, Skinner Lane, Leeds 7.

This review has taken a long time to get round to. Not because I've put it off and put it off, but because I

couldn't pull myself away from the race track.

Let me explain. You are the driver of a very (and I mean very) fast souped-up racing car — the red one. The computer is in charge of all the rest — the blue ones. Imagine an open road as straight as the Romans built them, and only the hills in the distance and an expanse of green all around you. Until you put your foot down cars are

whizzing past you at a phenomenal speed and disappearing into the far distance. You put your car into gear, step on the gas and you are away. The speed and excitement increase, as the tiny blue spots in the distance fast loom up into the shape of your opponents. Gauge your speed until the opportunity to slip between them or overtake on the inside

occurs, then step on it and the road is yours again.

Overdrive is a must for all Electron owners. The game does credit to the machine's sound effects, graphics (wait till you smash), and above all, the 3D effect which is very impressive.

Fred Short



Plausible

Program Interdictor Pilot Price £17.95 Micro Commodore 64 **Supplier** Supersoft, Winchester House, Canning Road, Wealdstone, Harrow, Middlesex.

There are a few flight simulators for the Commodore 64, but *Interdictor Pilot* is the first I have come across which simulates space flight. As you might guess from the name, the program simulates flight in a craft called the Interdictor Mk. III. A substantial pilot's instruction manual accompanies the cassette, and this book explains, in plausible sounding sci-fi terms,



Good value

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

While this assembler is not a full macro assembler it is powerful enough for all but the most advanced programmers as it can perform conditional assembly and will produce the code in a format to be used with a standard Sinclair linker program.

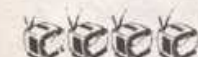
The assembler — and the editor which is supplied with it — may both be multi-tasked with say a Basic program or any other machine-code program which may also be multi-tasked. The space left which

all that the prospective pilot needs to know about the functions and operation of the craft.

The *Interdictor* is a combat patrol craft. In the simulations, you can practise take-off and landing from star-base, inter star-base flight and encounters with other ships (both friendly and hostile). A handy facility allows you to paralyse the other craft, so that you can examine them at close range. You can even run the simulator in slow motion for the tricky bits. Once you are proficient with the simulator, you can try your hand at some 'real' missions, where you will have no control over events.

There are too many details here to do it justice in a short review. It is essential to read the manual — which contains an amazing amount of information — before having a go, but it is well worth the effort.

Richard Corfield



you can use for other programs can be greater than 30K. You may also use this spare memory in conjunction with the assembler to load a copy of a file before it is assembled, so increasing the assembler's speed.

The manual supplied gives information on both programs, as well as giving an example of how to add commands to Basic. Chapter 6 gives a very useful look-up table of all the opcodes and shows what the state of the CPU's flags will be after an instruction has been executed.

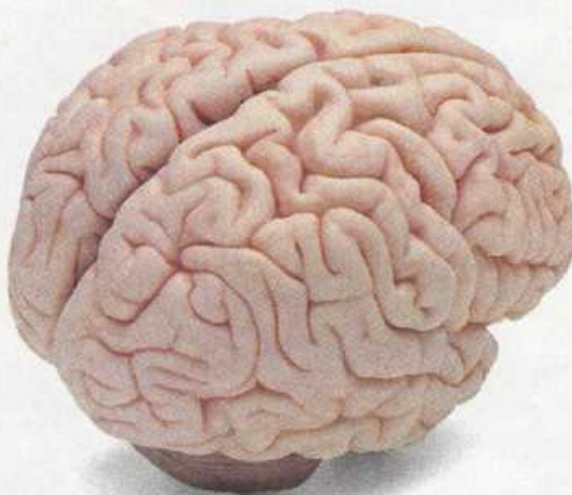
This assembler is good value. It does the job most people want it to do and is cheaper than the Sinclair assembler which is going to sell at £39.95.

Roger Thomas



Our new software

makes the most of yours.



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

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

And then set it to music.

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

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

You can do all this with a joystick.

But then you've only scratched the surface.

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

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

But not this one.

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

Its scope is as broad as your own mind.


ACTIVISION®
Your computer was made for us.

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

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



Are you only using

To only play games on a Commodore computer is like asking Albert Einstein to work out the square root of four.

The computer's brain barely ticks over.

To really stretch it, you need more interesting software programs. For example, record keeping, interactive education, stimulating adventure games or word processing.

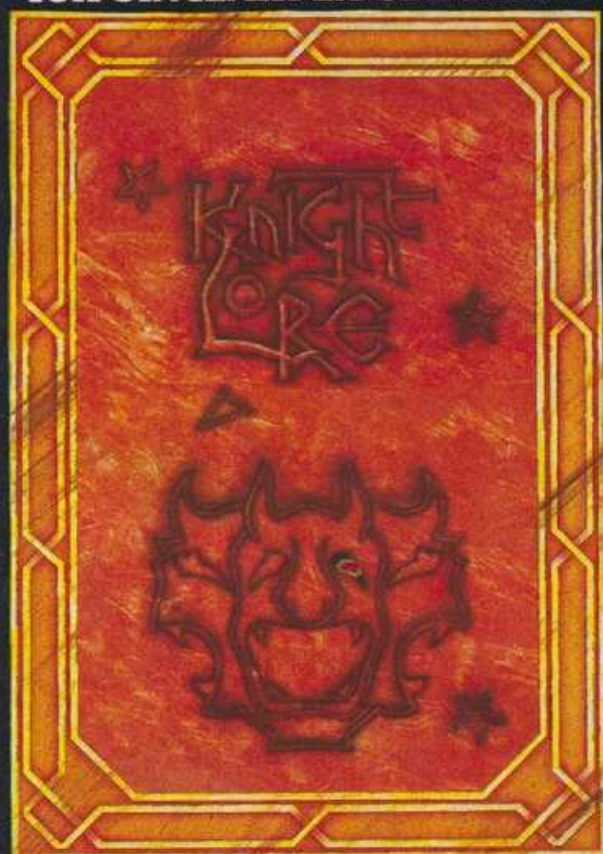
And for those you need peripherals.

Like a Commodore disk drive, a really fast storage and retrieval system with a vast memory.

Or a Commodore cassette unit, the inexpensive way of loading and storing programs.

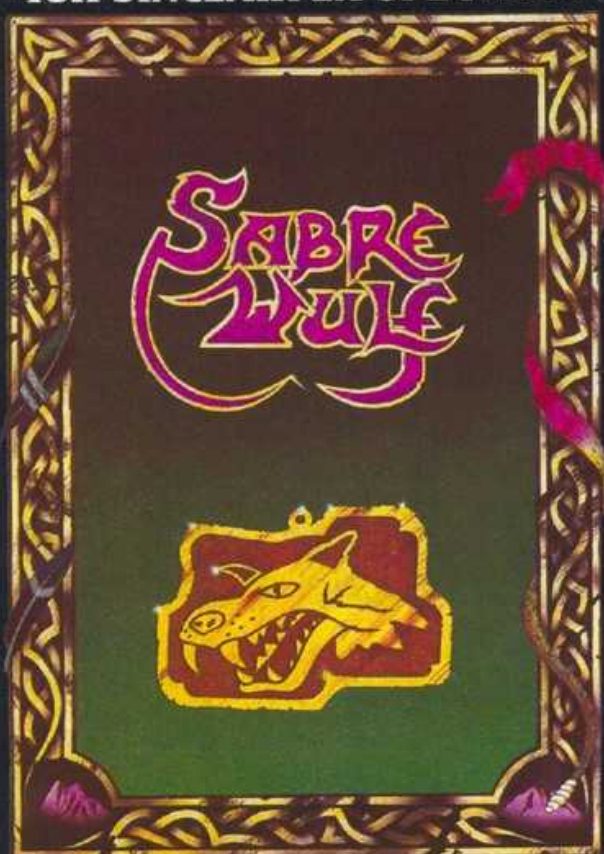
For those who like the idea of text and graphics being more alive and having greater clarity than on a TV, there's the Commodore colour monitor.

48K SINCLAIR ZX SPECTRUM

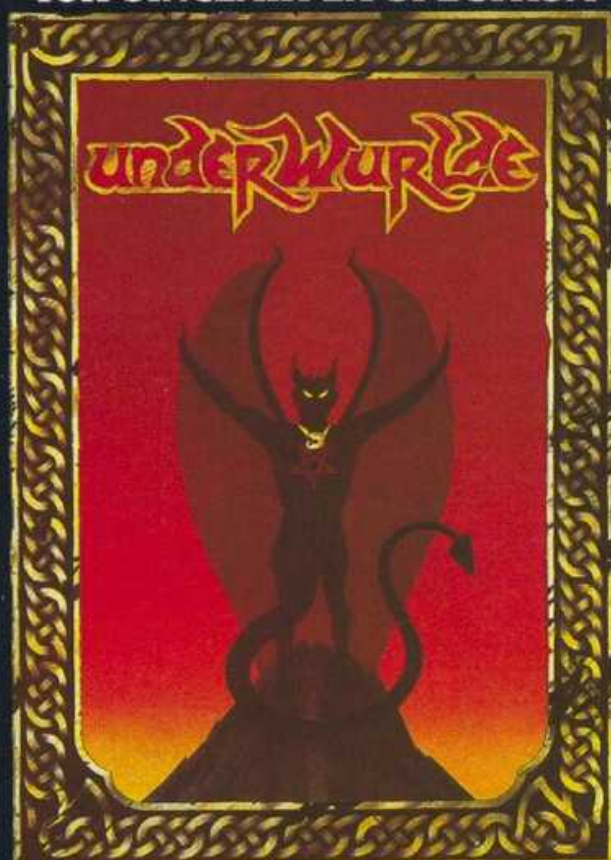


BBC MODEL B 1.2 OS

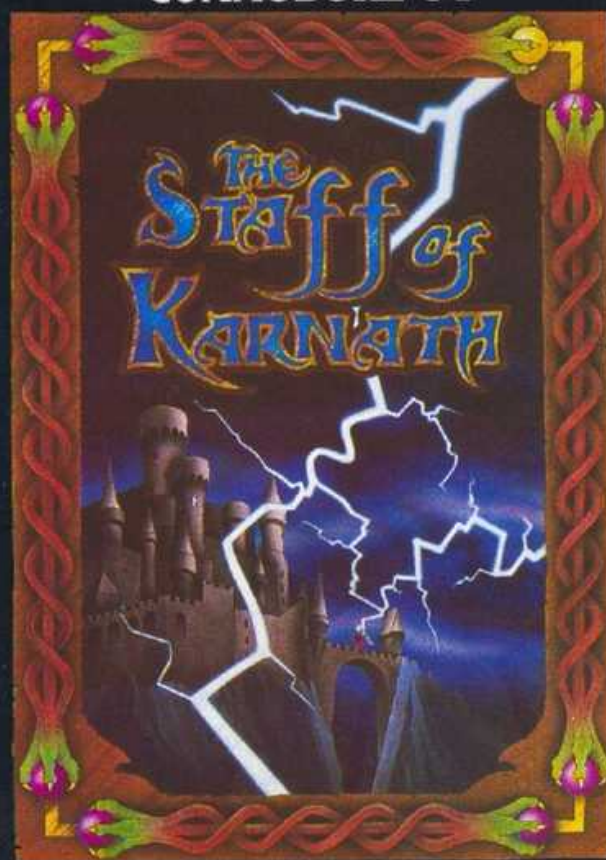
48K SINCLAIR ZX SPECTRUM



48K SINCLAIR ZX SPECTRUM



COMMODORE 64



"KNIGHTLORE", "UNDERWURLDE", "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&F are included) Tel: 0530 411485

Xmas soft hits

From the thousands of software packages released this year we've tried to separate the exciting, innovate programs from the Manic Miner clones, furtive freddies, boring multi-screen ladders and platform games, illiterate adventures, mega-hyped rip-offs, glossy crud, 'I think people are getting bored by a good graphics' excuse, and many other time-wasting, finance-exhausting, excuses for original thought. It wasn't easy. Graham Taylor burrows out from under the pile to give you the details.

Spectrum

The Spectrum has a lousy keyboard, rotten sound and colour attribute problems that cause objects to change colour as they pass over one another — but it *still* gets more exciting and innovative software developed for it than any other machine.

Last year the Ultimate games, *The Hobbit* and *Valhalla* were the front runners. What are this year's wonder programs?

To begin with the familiar. Ultimate Play the Game has consistently produced software never worse than good and in *Knight Lore* we have its greatest achievement ever, a program so graphically superb it, as *Jetpac* did before it, that it ups the stakes on just what Sir Clive's ageing machine is capable of — a thundering 'now beat that' to the industry.

Knight Lore features Sabreman, a character seen in previous Ultimate games and now, presumably, a sort of mascot figure for the company. He is stuck in a castle of well over 100 rooms, the victim of a curse such that as day turns to night (indicated by the movement of a sun or moon arcing left to right

on the bottom of the screen) he turns into a rather dopey-looking warewolf.

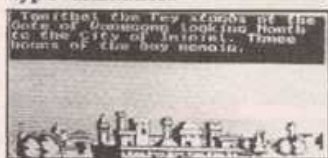
Sabreman has to collect objects from the rooms and deposit them in a specific order in a wizard's cauldron somewhere deep in the castle thus lifting the curse. Obviously the main part of the game is negotiating the various rooms and retrieving the various objects. The quality and style of the graphics are what lift the game away from all the other dodge and collect games.

Each of the castle rooms is represented with perspective and a sense of depth unsurpassed on home computers, the vantage point being as though seen through a camera mounted high in one corner of the room. Rooms are populated by guards, ghosts, spiky balls, prisoner style rovers, and sundry tables, ornaments, and other suitably medieval objects.

In most rooms the only way to get to the exit or desired object is either by clever timing, jumping before the lodge collapses to reveal spikes beneath, etc or ingenuity. Tables may be shoved around to provide surfaces

from which to jump, standing on an object you have collected may help you get over an otherwise impassable wall.

Apart from anything else the game is a triumph of design — the various characters are brought to life through cartoon-type animation.



Doomdark's Revenge

The 3D illusion works perfectly simply because of the care that has gone into the drawing and design. A near faultless game that, like other Ultimate games, leads you to say — "surely no more is possible on the Spectrum?"

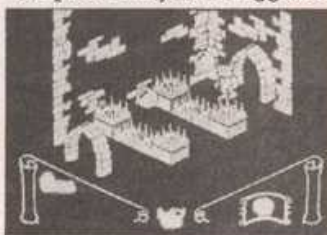
Technically much simpler but astonishingly innovative is *Deus Ex Machina* from Automata, a program like no other. *Deus* uses the computer as part of a total experience that also includes music, dialogue and sound effects to tell a story that mixes Aldous Huxley with rock concept albums, the Marx brothers and genetics to tell the story of life developing within the confines of a giant computer. An audio tape containing the music and dialogue is linked to the computer program via an introduction, spoken by Jon Pertwee. Other notables involved include Ian Davy, Frankie Howard and E P Thomson.

Although the effect is somewhat similar to a (very psychedelic) movie you are not merely a passive viewer. Whilst the program follows an inevitable sequence, within each section are 'games' in which you must try to assist the development of life.

Combining visual events with musical events makes for

a sense of total involvement in the program seldom, if ever, achieved in conventional computer games. It remains to be seen whether *Deus* represents the first step in a bold new direction for computer games or whether it proves to be a one-off creative cul de sac.

Another strong contender in the computer movie stakes has recently emerged. *Tir Na Nog* from Gargoyle Games features exceptional graphics and animation and a quest so difficult to achieve the manufacturers expect it to take over a year to complete. They even suggest it



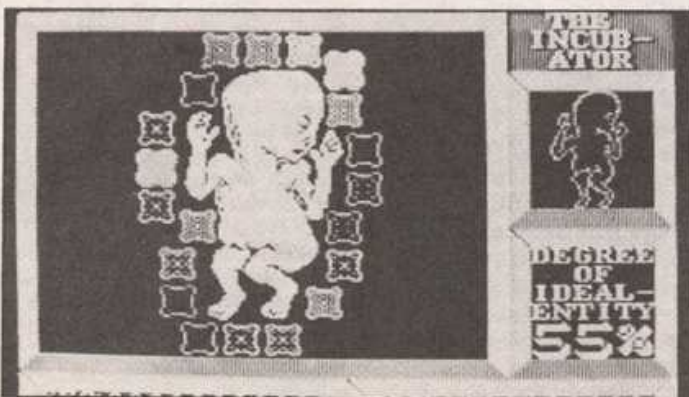
Knight Lore

may be necessary to consult your local library on ancient Celtic myth to unravel some of the conundrums.

The game features the hero Cacachulin who wanders the land of youth looking for the pieces of an ancient seal. A couple of the sections he may simply stumble across but most are already in the possession of other beings in the land — to get them back he must complete various sub-quests.

The actual graphic of the hero is animated using many more 'frames' than usual which makes his movement much more realistic than that seen before — his hair even waves about as if blown by the wind. The landscape is also impressively created over dozens of screens with distant castles and volcanoes, ancient monuments and secret doorways — all helping to create a sense of

Continued over the page



Deus ex Machina from Automata

Software choice

atmosphere.

Many other titles are worthy of consideration on the Spectrum. The recently released *Doomdark's Revenge* actually improves upon *Lords of Midnight* — the original, by developing the graphics, options available and scope of the game. Both games combine adventure and strategy styles in a complex and visually appealing way. *Backpackers Guide*

To the Universe is a good quality scrolling screen arcade game for those into alien bashing, but with enough extras to keep the interest up for those who want something more complex.

For those requiring more serious software *Triptych* brought out a range of packages for most micros which both teach and facilitate such things as decision making

and planning. *Tasword II* is still just about the best wordprocessor around for the Spectrum. If you want to write your own game try the new improved picturesque machine-code utilities. Try Campbell Systems *Masterfile* if you want a filing system.

Knight Lore, *Ultimate*, *The Green*, *Ashby de la Zouch*, *Leicestershire*; *Deus ex Machina*, *Automata*, 27 Highland Road, Portsmouth, Hants;

Tir Na Nog, gargoyle Games, 74 King Street, Dudley, West Midlands; *Doomdark's Revenge*, Beyond, 3rd Floor, Lector Court, 153 Farringdon Road, London EC1; *Backpacker's Guide to the Universe*, Fantasy, Fauconberg Lodge, 27a St George's Road, Cheltenham, Glos; *Tasword II*, Tasman, Springfield House, Hyde Terrace, Leeds; *Picturesque Assembler*, Picturesque, 6 Corkscrew Hill, West Wickham, Kent; *Masterfile*, Campbell Systems, 15 Rous Road, Buckhurst Hill, Essex.

Commodore 64

This year saw a flood of American software for this machine released in this country.

Much was no better or worse than home produced material but there were a few gems.

Ghostbusters proved that just because a computer game is a spin-off from a popular movie and is produced by a large company it doesn't have to be complete dross. On the contrary *Ghostbusters* is a pretty remarkable game in many ways.

It mixes arcade zapping with a veneer of strategy elements, adds great graphics and even greater sound and produces a computer game that really does reflect the lively, ebullient and dazed qualities of the film. First you buy your ghostbusting wagon, traps and so on, then after consulting your map you must find and capture the ghosts. The scene changes from 'shop' to map to road to ancient mansion as appropriate and the graphics are large, colourful and funny — none of the ghosts look too threatening. However what really makes the game is the computer speech and the astonishing soundtrack music.

The hit music to *Ghostbusters* with its infectious rhythm and chorus is faithfully recreated on the Commodore 64 using only the three channel SID chip — a triumph of programming and arranging.

But it doesn't end there, using advanced digital techniques speech is produced by computer — not the usual Dalek cackle but recognisable and inflected sentences and phrases. In the intro section you can get the computer to shout 'Ghostbusters' in time to

the music.

Tony Crowther must be responsible for more quality games on the Commodore than any other single programmer. His distinctive work first with *Alligata* and then with *Gremlin Graphics* has seen few equals in terms of playability and graphics.



Ghost busters from Activision

From a string of excellent and distinctive programs like *Loco*, *Suicide Express*, *Monty Mole*, I have picked *Potty Pigeon* as the best simply because I like the plot and as a game it seems to appeal to a slightly different audience from the usual tribe of teenage males.

The idea of the game is to fly a pigeon around collecting twigs and taking them back to the nest. Mostly this involves flying down on to the road to pick up each twig and returning to the nest. As the game progresses so traffic increases on the road and obstacles like other birds appear in the sky.

A simple plot but excellent graphic design produces a detailed background and a pigeon which is no mere blob but possesses both detail and character. Like many of Tony's games, the chief strengths of the game are the quality of the graphics and a well judged sense of pace.

Whilst there is an official *Zaxxon* version available for the Commodore, it is not as



Potty Pigeon from Gremlin Graphics

compulsive as a game which, though not an exact copy of the original, achieves to a far greater extent the sense of drama and strong visual sense that marked the original out.

Havoc has *Zaxxon's* edge-on, 3D cut-away view as well as occasional missiles and bombs to be negotiated but greater emphasis is given to the piloting element — some sections of the game require absolutely precise flying.

Perhaps more important still is atmosphere, the plane is piloted through what appears to be the empty streets of a vast city full of towering skyscrapers and gigantic monuments. The only sound (apart from the occasional missile) being the drone of your engine.

There are a number of other excellent programs for the 64. *Summer Games* from Epyx — released by Quicksilver in this country — is a version of the popular *Track and Field* game which actually surpasses the slot-machine original. CBS's UK venture into software contains at least one gem in *Impossible Mission* again created by Epyx. It features a daredevil action man, complicated plot and excellent speech like *Ghostbusters*. Listen out for the devilish 'kill him my robots' for real ham

acting. Sublogic's *Flight Simulator II* is very good — if expensive. Beyond's *Lords of Midnight* is worth a look. If you are interested in music then try *Musicalc* from Musicalc UK. Quicksilver's *Doodle* is a good drawing program. If you want a word processor try *Paper Clip* from Batteries included slightly cheaper is *Micro Wordcraft* from Androgenic. Again from Androgenic — *Swift* is a low-cost spreadsheet.

Ghostbusters, Activision, 16 Harley House, Marylebone Road, London NW1; *Potty Pigeon*, Gremlin Graphics, 22 Carver Street, Sheffield S1; *Havoc*, Dynavision, PO Box 96, Luton; *Summer Games*, Epyx, released through Quicksilver, Palmerston Park House, 13 Palmerston Road, Southampton; *Impossible Mission*, Epyx, released through CBS, Ashbrook House, 3-5 Rathbone Place, London W1; *Flight Simulation II*, Sublogic, available through The 64 Supplies Company, PO Box 19, Whitstable, Kent; *Lords of Midnight*, Beyond, Lector Court, 153 Farringdon Road, London EC1; *Musicalc*, Musicalc UK, The Paradox Group, The Metropolitan, Enfield Road, London N1; *Doodle*, Quicksilver, Palmerston Park House, 13 Palmerston Road, Southampton; *Paperclip*, Batteries Included, available through The 64 Supplies Company, PO Box 19, Whitstable, Kent; *Woodcraft* and *Swift*, Audiogenic, PO Box 88, Reading, Berks.

BBC

Whereas with the Commodore and the Spectrum it was no easy task deciding on what programs represented the best available on the machine — with the BBC it is absurdly easy.

Elite from Acornsoft is the best games program available on the BBC and rivals anything available on any other machine. In fact *Elite* is to get an advertising campaign on TV all to itself.

The BBC is a fast and powerful machine in many ways (apart from memory) but, perhaps because of the way its serious, educational uses have been stressed in the past, games on the machine have been lacklustre and technically far inferior to those on other machines. Relative to previous BBC software *Elite* represents an enormous leap in sophistication and complexity, relative to games on other machines it's

represented in three dimensions so you can fly around and behind them.

The aim is initially to make a profit but beyond that you must try to move up the ranks by winning battles and outmanoeuvring the enemy.

You buy goods cheap on one planet, sell them at a profit on another. The classic, and most dangerous, example of this principle is with narcotics — these are cheap and freely available on some planets, but illegal and thus worth a fortune on others.

People have been known to cancel holidays and stay up all night playing *Elite*. Acorn even believes that it is selling Electrons to people who buy the machine just to play the Electron version of the game. Need I say more...

Confronted with the above there are few programs in anything like the same league on the BBC, but Ultimate has produced its original *Jetpac* for it. It also has a version of

Amstrad MSX and QL

Three machines, well two machines and a design standard for a number of others — which were released this year.

command. Mostly the screen displays your cockpit window as you hurtle through space. Using battle computers, defensive shields and photon torpe-



Inevitably new machines don't get really spectacular software at the beginning. The programmers haven't had the time to get totally familiar with the full range of possibilities particularly for a machine like the QL, based on a relatively unknown processor chip. Nevertheless, it is possible to separate the good from the bad and all the systems now have at least one program that seems to be noticeably better than the rest.

The Amstrad ought to get some excellent software — based on the ageing but fast Z80 with 64K, excellent graphics and reasonable sound the basic material is all there. The first program to really do any sort of justice to the Amstrad is *Codename Mat* produced for Amsoft by Micromega.

Codename Mat is a sophisticated version of the old computer chestnut, *Star Trek* in which you travel the universe seeking out and destroying the invading forces. Sophisticated graphics and various new features have turned what started life as a rather tedious strategy game into a space epic — not *Elite* but excellent fun.

You command your starship and two other fleets, a map shows the sites of planets, moons, baddie forces and your other ships which may be sent to any region by your

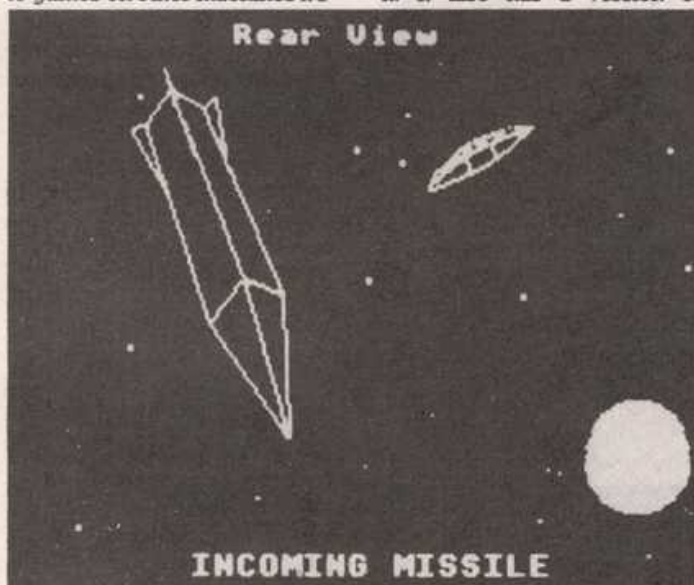
dos you must rid each section of the galaxy of invaders.

The game is partly shoot 'em up partly flight simulation, partly strategy. The illusion of hurtling through space is well done with an occasional passing meteor for extra realism. A compelling game that can take hours to play. Others for the Amstrad — if you want an adventure try the *Nemesis Arnold* programs.

There are a number of companies working on MSX material but as yet, perhaps because not enough machines have yet been sold, there is little that is genuinely impressive. One exception is Konami's *Track and Field* version known as *Hyper Olympics*. This is a near perfect recreation of the slot-machine original — unsurprising really since Konami were responsible for the original.

The game, ideal for an Olympic year involves putting a little man through various Olympic events, various lengths of race, pole vaulting, hammer throwing, hurdles and so on. The detail on the graphics is remarkable and the way the machine controls have been adapted to test a different skill at each event is ingenious. Many a computer is likely to have two of its keys battered to

Continued over the page



Elite from Acornsoft

a smaller, but still significant, step forward.

Elite is the space game to end all space games, it has everything — journeys through space, docking, attack sequences, trading in legal and illegal goods, space pirates, hyperspace, short and long-range scanners, other planets, space stations meteors, etc, etc. All objects are represented in a form of vector graphics, ie, they are constructed in outline only but, and this is 40% of the game, they are

Scrabble which plays a pretty mean game from Leisure Genius. Watch out too for Island Logic's excellent music program, *The Music System*. If you need word a processor try the old standard *Wordwise*.

Elite, Acornsoft, 104 Hills Road, Cambridge; *The Music System*, Island Logic, 22 St Peters Square, London W6; *Jet Pac*, Ultimate, The Green, Ashby-de-la-Zouch, Leicestershire; *Scrabble*, Leisure Genius, 3 Montagu Row, London W1; *Wordwise*, Computer Concepts, Gaddesden Place, Hemel Hempstead, Herts.

Xmas soft hits

bits by over-eager contestants in the 400 metres.

And what of the QL, Sir Clive's technically advanced but controversial new machine? For a whole variety of reasons software has been exceptionally slow in coming through — microdrive, unfamiliar processor, production delays, doubts over market, etc.

In fact, apart from the Psion packages which come with the machine there is almost nothing currently available that can be recommended.

The main exception to the above is Psion's *Chess* program for the machine. Not only has the program beaten dedicated chess machines in tournaments, not only does it have a wide variety of playing options but, most spectacularly of all, the game is represented in 3D.

Your perspective on the board is such that the opponent's pieces appear to be further away — edge on, instead of viewed from above, the norm up to now. The illusion of pieces moving behind and in front of one each other is astonishing and reveals just what the machine is capable of given programming effort. There are now about four assembler packages available for the QL so we should see more programs next year.

Codename Mat, Micromega, 230-236 Lavender Hill, London SW11; **Trial of Arnold Blackwood** and **Arnold Goes to Somewhere Else**, Nemesis, 10 Carlow Road, Ringshead, Kettering, Northants; **Hyper Olympics**, Konami, released through Micro Peripherals, 69 The Street, Basing, Basingstoke, Hants; **QL Chess**, Sinclair Research, Stanhope Road, Camberley, Surrey.

software seemed to improve significantly — mixed-mode graphics and sprites took the place of the green screen and poor quality block graphics. One game in particular, was universally declared best ever on the dragon — Wintersoft's follow up to the *Ring of Darkness* called *Return of the Ring*.

Return of the Ring is a machine-code adventure with complex sentence analysis, hires pictures and 3D sequences. The computer even gets to control its own characters. As in *Dungeons and Dragons* style games, you may define your own character allotting points in different amounts to different qualities before you begin the game. How intelligent, strong, lucky, etc, you are is a balance you decide.

Parts of the game involve buying and trading, others are more like text adventures — something for every sort of adventurer in fact. If more programs had been of this quality earlier or had been produced sooner for the Dragon, its eventual fate might have been different.

The Oric didn't actually die

this year but all the signs of market failure are there — the Oric is currently on sale at highly reduced prices in many shops and there is little really good software available. For those who have the machine good news comes in the form of a company that is importing some of the best French software for the machine. The Oric was considerably more successful in France than it has been in the UK.

Of this new software one of the most interesting 'new' titles is *Tyrann* by No Man's Land. Like *Return of the Ring* this game takes some of the basic *Dungeons and Dragons* concepts and adds to them. You can choose to create one of four general types of character, Warrior, Thief, Druid or Magician. Each type has different strengths and weaknesses and as you play the game so the nature of the character will develop — gaining experience from fights, etc. You control six characters in all, each defined from the choices above.

You explore a village, starting point for your quest, each character may be moved in turn, characters may pass objects to one another, there are spells to be cast and secret doors to be opened. The screen display shows a simple 3D line drawing of your movement among the streets and through the doors of the village. Through solving problems and winning fights, characters may move up to a new level whereupon they are provided with new, more potent spells. When your team has reached an average of Level II then the main part of the adventure may be loaded. This contains more objects more mazes, more battles, etc. Although technically quite simple, *Tyrann* is nevertheless a compulsive adventure that should keep you going for weeks.

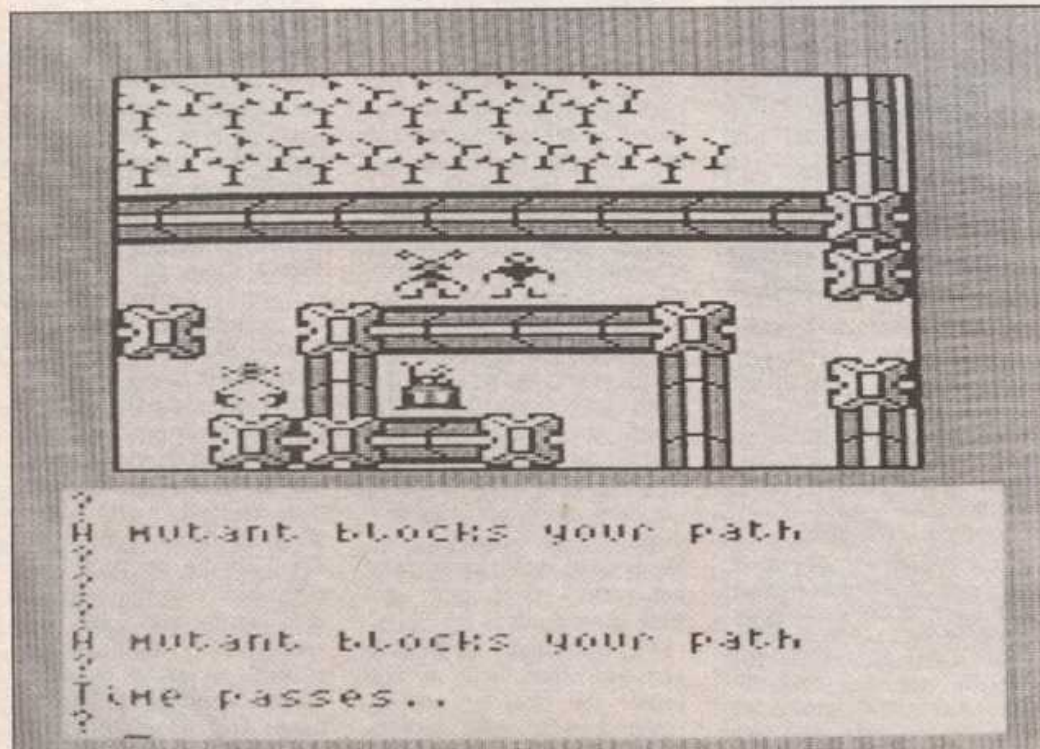
Return of the Ring, Wintersoft, 30 Uplands Park Road, Enfield, Middlesx; **Tyrann**, No Man's Land, High Tech Units 1 and 2, Conlon Developments, Watery Lane, Darwen Lane, Darwen, Lancs.

Dragon and Oric

Two machines that suffered major set-backs this year were Dragon and Oric. Dragon Data collapsed and future development of either the Dragon 32 or 64 now

looks very doubtful. Machines ended up being sold off very cheaply in the shops.

However, almost at the same time as the collapse occurred the general level of Dragon



Return of the Ring from Wintersoft

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

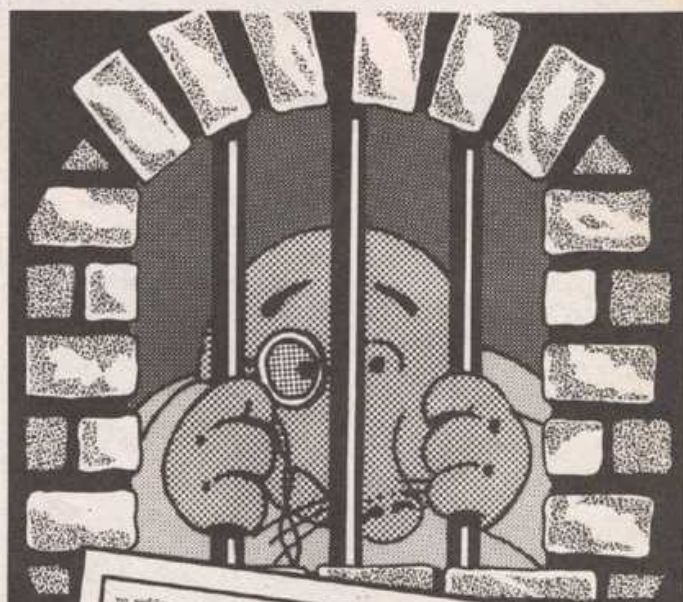
All versions contain a programme an audio tape and glossary.

(Prices from £12.95)

Versions available from
Boots, Smiths and leading retailers.

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

MONTY MOLE IS INNOCENT



OFFICIAL PETITION

Can you stand by and let this poor little innocent Mole suffer a life of hard labour in Scudmore Prison? Join the growing band of protestors and pledge your support to our campaign of Innocence. In return for your loyalty you'll be rewarded with the chance of winning a prize in our "Free Monty Mole Draw."

And if peaceful protest fails don't worry. Monty's closest friend Sam Stoot is sharpening his claws and planning "Monty's Great Escape" - a bloody encounter well worth the waiting for.

Name _____ Age _____
Address _____

Computer owned _____

Rules

1. All entries to be received at Gremlin Graphics by December 14th
2. Draw to be made on December 17th. Results published in this magazine week commencing January 1985
3. The decision of the organisers is final.
4. All employees and associates of the organisers, and their families, are prohibited from entering.

**SEND OFF TODAY
AND YOU
COULD WIN**

£50.00

WORTH OF GAMES SOFTWARE



Gremlin Graphics Ltd., Alpha House, 10 Carver Street,
Sheffield S1 4FS. Tel: (0742) 753423.

Words of one syllable

Roger Barker takes the bother out of using microdrives on the Spectrum 48K

Microdrives have made loading Spectrum programs a very much quicker process; however, they are marred by the horrendous syntax of the Microdrive commands. For the uninitiated, the command to load a program called "Prog" from Microdrive 1 is: Load "M";1;"Prog". I decided to write a command so that programs could be loaded simply by entering '*' followed by the program name; eg *Prog.

The routine works by changing the

address held in the system variable Vector, so that any command causing an error is first checked by the coding starting at address 65439. If the command does not start with an asterisk then it is ignored, if it does then it is processed.

The name of the program after the asterisk is extracted and stored, then the command line is extended to hold the full Microdrive Load command, although this is invisible to the user. An assembler listing is given for those who wish to study this

technique in more detail. The whole thing takes just 97 bytes.

First key in the listing for the loader program and run it to set up the machine code and store it on Microdrive as "st". Next key in the "Star" program — if you leave the Rem's out it is only one line — and save it with the command Save "M";1;"star" Line 10. To make the command available simply load "star". The command will remain installed until you switch off your Spectrum, and any other programs from Microdrive 1 can be loaded with just an asterisk and their name.

Because the coding resides in Ram there will always be a slight risk of over-writing it; what a pity that Sinclair have not put a few similar commands in the Interface 1 Rom — which has about 300 bytes of free space.

Star Program

```
1 REM *** "STAR" PROGRAM
2 REM ***
10 CLEAR 65438: LOAD *M";1;"s
t"CODE : POKE 23735,159: POKE 23
735,255
```

M/C Loader

```
10 REM *** M/C CODE LOADER
20 REM ***
30 CLEAR 65438
40 LET TOTAL=0
50 FOR N=1 TO 97
60 READ BYTE
70 POKE (65438+N),BYTE
80 LET TOTAL=TOTAL+BYTE
90 NEXT N
100 IF TOTAL<>2666 THEN PRINT "
ERROR IN DATA STATEMENTS." : STOP
110 SAVE *M";1;"st"CODE 65439,
97
120 DATA 215,24,0,254,42,19,24
6,1,33,243
130 DATA 255,6,10,229,54,32,35,
16,251,225
140 DATA 6,11,229,197,215,22,0,
193,225,254
150 DATA 53,40,29,254,13,40,7,5
,40,22
160 DATA 119,35,24,234,237,91,9
7,92,27,27
170 DATA 33,227,255,1,29,0,237,
176,237,83
180 DATA 97,92,205,180,5,195,19
3,5,58,239
190 DATA 42,34,77,34,59,49,14,0
,0,1
200 DATA 0,0,59,34,32,32,32,32,
32,32
210 DATA 32,32,32,32,34,13,128
```

Assembly Listing

```
*HISOFT GEN53 ASSEMBLER*
Copyright © HISOFT 1983
All rights reserved
```

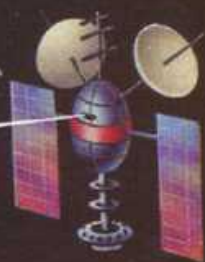
Pass 1 errors: 00

FF9F	10	*C-	ORG	65439
5C61	20	WORK50	EQU	#5C61
0018	30	GETCHR	EQU	#0018
01F0	40	ERR#5	EQU	#01F0
0020	50	NXTCHR	EQU	#0020
0587	60	ST_END	EQU	#0587
05C1	70	END1	EQU	#05C1
FF9F	80	START	RST	16
FFA0	90		DEFW	GETCHR
FFA2	100		CP	"*"
FFA4	110		JP	NZ,ERR#5
FFA7	120		LD	HL,NAME+1
FFDA	130		LD	B,10
FFAC	140		PUSH	HL
FFAD	150	ST1	LD	(HL),"
FFAF	160		INC	HL
FFB0	170		DJNZ	ST1
FFB2	180		POP	HL
FFB3	190		LD	B,11
FFB5	200	ST2	PUSH	HL
FFB6	210		PUSH	BC
FFB7	220		RST	16
FFB8	230		DEFW	NXTCHR
FFBA	240		POP	BC
FFBB	250		POP	HL
FFBC	260		CP	" "
FFBE	270		JR	Z,ST4
FFC0	280		CP	13
FFC2	290		JR	Z,ST3
FFC4	300		DEC	B
FFC5	310		JR	Z,ST4
FFC7	320		LD	(HL),A
FFC8	330		INC	HL
FFC9	340		JR	ST2
FFCB	350	ST3	LD	DE,(WORK5P
FFCF	360		DEC	DE
FFD0	370		DEC	DE
FFD1	380		LD	HL,COMMND
FFD4	390		LD	BC,29
FFD7	400		LDIR	
FFD9	410		LD	(WORK3F),D
FFDD	420	ST4	CALL	ST_END
FFDE	430		JP	END1
FFEE	440	COMMND	DEFB	#3A,DEF
FFEF	450		DEFM	*M";1
FFFB	460		DEFB	#0E,#00,#0
FFFD	470	NAME	DEFM	"
FFFE	480		DEFB	#0D,#00

Pass 2 errors: 00

Table used: 162 from 300

BUGGY BLAST



SPACE MISSION SIMULATION



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.

SPECTRUM 48K

**GOLD
EDITION
£5.95**

Audio visual

Got a video recorder and a BBC B? Then try Video Indexer by A J Carter

Do you use a video recorder? Do you know exactly what programs have been recorded on each of your cassettes? Do you often lose parts of programs because you do not know how much recording time is left on a cassette? If your answers are 'yes', 'no' and 'yes' then read on, because the following program is definitely for you.

This program generates an index for your cassettes and also calculates how much time you have left on the tape. The program asks for the length of the cassette, the number of programs currently on the cassette, and the title and length of each of the programs. It then generates a test-card type background and then prints the index on the screen.

To get this index on to the video cassette, you have to take the aerial lead out of the socket on the back of the video and plug the TV lead from the computer into the same socket. (It would be more convenient to do this before you run the program.) If you plug your computer into a video and find that you do not get a picture, do not panic! This just

means that you need to tune a channel on your video to suit your own computer. Mine seemed to be very close to Channel 35.

Once you have got a clear picture of the copyright message, Load the computer with the indexer program, then place the video cassette in the video recorder. Check that the video cassette has been fully rewound to the beginning.

Run the computer program and enter the data as required, and when prompted by the program, start the video recorder recording. Leave it recording until the index has been on the screen long enough for you to have read it at least twice, then stop the video recording.

It might be wise not to index existing cassettes unless you are sure there is enough tape at the beginning or you do not mind losing some of the credits at the start of the first program.

Program Notes

Line No

10 Calls the data input procedure.

- 20-30 Sets the 16 colour display mode and calls the display procedure.
- 60 Declares the specified variables as 'Local' to the display procedure.
- 70 Turns the text cursor off.
- 80-110 Draws first band of colour.
- 120-150 Draws second band of colour.
- 160-190 Draws third band of colour.
- 200-230 Draws fourth band of colour.
- 240-270 Draws fifth band of colour.
- 280-310 Draws sixth band of colour.
- 320-380 Outputs the contents of the cassette, the length of the cassette and the recording time left on the cassette.
- 390 Stops the program from finishing until the video recorder has been stopped.
- 410-430 Beginning of the data input procedure. Declares variables 'Local' to this procedure.
- 440-450 Outputs prompts and inputs the length of the video cassette and the number of programs on the cassette.
- 460 Reserves memory space for the titles of the programs in the form of a single dimension array.
- 470-540 Inputs the titles of the programs on the cassette and calculates the free recording time in mins.
- 550-600 This is the data verification loop and if data fails the data input procedure is called recursively.
- 610-630 This section synchronises the computer display to the video recorder.

Variables

Simple: L% the length of the video cassette.
PL% the length of a program.

For a better image



The Sinclair QL gives you the best in micro technology. So why entrust it to a screen that cannot match this?

A blurred, incomplete or fuzzy image can ruin even the best program. Not to mention the strain it may put on your eyes.

Now, we can offer you the monitor to match the micro.

The Prism QL14 colour monitor has been designed to meet the exact needs of the QL.

It gives you clear, pin-sharp graphic images, and the ability to display the full 85 column text available on the QL.

And the light-weight Prism QL14 is fully portable, incorporating a retractable handle and is provided with the necessary connecting cable.

PRISM

TPL% the total length of all the programs. (This is incremented inside the data input loop.)
P% the number of programs currently on the cassette. (Used to control the extent of the data input/output loops.)

LR% contains the recording time left on the video cassette.
Control: I% is used throughout the program as a general looping variable, and is also used to control the X-coordinates of the background draw function.

String: V\$ this contains the response from the verification routine and is acted upon depending whether it is y or n.
Array: T\$ this contains the titles of the programs on the cassette.

```

1 REM *****
2 REM *Ramp Software (c)1984 *
3 REM *****
10 PROCinput_data
20 MODE2
30 PROCdisplay
40 END
50 DEFPROCdisplay
60 LOCAL I%
70 VDU23,1,0;0;0;0
90 FOR I%=0 TO 213
90   PLOT69,I%,0
100   GCOLOR,5: DRAW I%,1279
110   NEXT I%
120 FOR I%=214 TO 427
130   PLOT69,I%,0
140   GCOLOR,6: DRAW I%,1279
150   NEXT I%
160 FOR I%=428 TO 641
170   PLOT69,I%,0
180   GCOLOR,2: DRAW I%,1279
190   NEXT I%
200 FOR I%=642 TO 855
210   PLOT69,I%,0
220   GCOLOR,4: DRAW I%,1279
230   NEXT I%
240 FOR I%=856 TO 1069
250   PLOT69,I%,0
260   GCOLOR,7: DRAW I%,1279
270   NEXT I%
280 FOR I%=1070 TO 1280
290   PLOT69,I%,0
300   GCOLOR,1: DRAW I%,1279
310   NEXT I%
320 PRINT TAB(6,0); "CONTENTS"
330 PRINT TAB(0,2); "1: "; T$(1),

```

```

340 FOR I%=2 TO P%
350   PRINT TAB(0,I%+2); I%; " "; T$(I%)
360   NEXT I%
370 PRINT TAB(1,28); "Len. left "; LR%; " mins"
380 PRINT TAB(2,26); "Length "; L%; " mins."
390 REPEAT UNTIL GET=32
400 ENDPROC
410 DEFPROCinput_data
420 LOCAL I%,V%,PL%
430 CLS
440 PRINT TAB(0,2); "What is the length of the
   Cassette, in (mins)";: INPUT L%
450 PRINT TAB(0,4); "How many programs are on this
   cassette ";: INPUT P%
460 DIM T$(P%)
470 PRINT "Type the titles & lengths (mins) of the
   programs on the cassette."
480 FOR I%=1 TO P%
490   INPUT T$(I%)
500   INPUT PL%
510   TPL%=TPL%+PL%
520   NEXT I%
530 CLS
540 LR%=L%-TPL%
550 PRINT TAB(8,0); "CONTENTS"
560 FOR I%=1 TO P%
570   PRINT I%; " "; T$(I%)
580   NEXT I%
590 PRINT "Is this correct. (Y/N)";: INPUT V$
600 IF V$="N" OR V$="n" THEN PROCinput_data
610 PRINT TAB(2,26); "Hit <RETURN> and start
   video recording."
620 REPEAT UNTIL GET=13
630 ENDPROC

```

..... picture this

At only £199.99, the stylish QL14, finished in matt black and including a detachable anti-glare glass front, ensures that you get the best from your QL.

So for a clearer picture simply speak to your local dealer.

After all, it's not only the image on your QL that's at stake.

TECHNICAL SPECIFICATIONS

Number of columns	85
Tube	90° 14" (34 cm "V") self-converging colour tube
Video Bandwidth	12 MHz
Shadowmask pitch	0.63 mm
Direct RGB input	5 volt pp into 390 ohms
Dimensions	375 mm wide x 375 mm high x 390 mm deep
Weight	12 kg (26 lbs)
Country of origin	UK



Prism Microproducts Limited
Prism House, 18/29 Mora Street
City Road, London EC1 8BT
Telephone: 01-253 2277

VIC 20

CHARIOT RACE

£6.95

DICE WITH DEATH

THRILLS

SPILLS

FRENZY

IT'S A TOUGHIE

GET IT NOW!

AVAILABLE FROM -

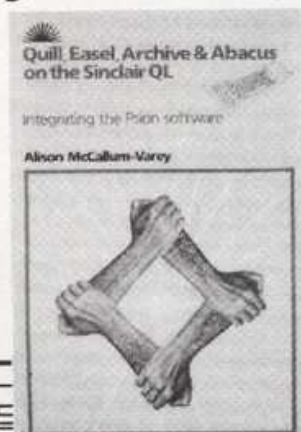
Spectrum **Byte** **GRANADA**

WOOLWORTH HMV Co-op Stores

AND ALL GOOD SOFTWARE STORES!

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

You've got your QL hardware. You've got your Psion software.



Now get your Sunshine book.



Just released from Sunshine is the latest book from the highly acclaimed QL Classics series – and it's called *Quill, Easel, Archive & Abacus on the Sinclair QL*. All these packages, which are included with every QL sold, are recognised as powerful in their own right, but when working together with one another, they become highly effective problem-solving tools for business.

Alison McCallum-Varey's book introduces you to all the four packages, but, most importantly, shows you exactly how to run them as a complete system. This book, essential for every QL Owner, will expand the day-to-day use of your QL, letting you run Quill and Archive in tandem for instance, and then outputting the results for graphic interpretation by the Easel package.

If you've Quill, Easel, Archive and Abacus on your Sinclair QL, then you need *Quill, Easel, Archive and Abacus on the Sinclair QL*.

Please send me *Quill, Easel, Archive & Abacus on the Sinclair QL* at £6.95 plus 50p p&hp. I enclose a cheque/postal order for £
payable to Sunshine Books.

☐ Please charge my Visa Access card No.

valid from _____ expires end: _____

Signed: _____

Name: _____

Address: _____

Send to: Sunshine Books, 12-13 Little Newport Street, London WC2R 3LD.
Look out for the Sunshine range in W.H. Smith's, Boots, John Menzies, other leading retail chains and all good bookshops. Dealer enquiries 01-435 1343.

I LOVE YOU

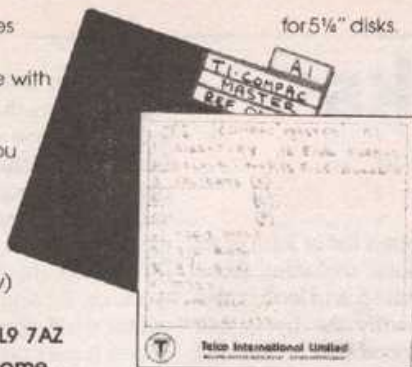
little floppies - so these are just for you!

Full depth colour-coded sleeves
Ruled both sides for extensive
contents listing and complete with
matching index tabs.
A complete filing and
identification system where you
need it - with your disks.

In packs of 10 sleeves and
tabs - £3.65 inc p+p
Specify colour
(red, green, blue or yellow)

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

Trade enquiries welcome.



for 5 1/4" disks.

GRAND XMAS SALE

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

	RETAIL	SALE PRICE
(1) ACORN ELECTRON	£199.95	inc vat £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	£399.00	£379.00
(8) ROTRONICS WAFADRIE 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: 109947 457

!DIPUT?

You may think we are when you
look at these ridiculously low soft-
ware prices
Our massive purchasing power
enables us to pass on

PRICE ADVANTAGES to you THATS NOT STUPID

Please tick appropriate boxes

VIC 20	OUR PRICES
Rescue from Castle Dread <input type="checkbox"/> Curse of Werewolf <input type="checkbox"/>	2.99
Battlefield <input type="checkbox"/> Galactic Abductor <input type="checkbox"/> Pharaohs Tomb <input type="checkbox"/>	3.50
Snooker <input type="checkbox"/>	4.50
Grandmaster Chess <input type="checkbox"/>	7.95

ATARI	
Valley <input type="checkbox"/> Stockmarket <input type="checkbox"/> Planetfall <input type="checkbox"/>	2.99
Escape from Pulsar 7 <input type="checkbox"/> Time Machine <input type="checkbox"/>	
Circus <input type="checkbox"/> Golden Baton <input type="checkbox"/>	5.50

COMMODORE 64	
Cosmic Split <input type="checkbox"/> Pottit <input type="checkbox"/>	2.99
Armageddon <input type="checkbox"/> Chinese Juggler <input type="checkbox"/> Aquaplane <input type="checkbox"/>	
Johnny Reb <input type="checkbox"/> Hungry Horace <input type="checkbox"/> Super Gridder <input type="checkbox"/>	3.50
Scramble <input type="checkbox"/> Burger Time <input type="checkbox"/> Defender <input type="checkbox"/> Bat Attack <input type="checkbox"/>	
Bug Blaster <input type="checkbox"/> Pyramid <input type="checkbox"/> Orange Squash <input type="checkbox"/> Mothership <input type="checkbox"/>	4.50
Scope 64 <input type="checkbox"/>	7.99

SPECTRUM	
Arcadia <input type="checkbox"/> Hunter Killer <input type="checkbox"/> Airliner <input type="checkbox"/>	
Adventure of St. Bernard <input type="checkbox"/> Penetrator <input type="checkbox"/> Sheer Panic <input type="checkbox"/>	
Moonbuggy <input type="checkbox"/> Woods of Winter <input type="checkbox"/>	2.50
Aquaplane <input type="checkbox"/> Zoom <input type="checkbox"/> Invasion of Body Snatchers <input type="checkbox"/>	
Rommel's Revenge <input type="checkbox"/> Trans-am <input type="checkbox"/> Psst <input type="checkbox"/> Nightlife <input type="checkbox"/>	3.50

BBC	
Danger UXB <input type="checkbox"/> Bandits at 3 o'clock <input type="checkbox"/> Roman Empire <input type="checkbox"/>	2.99
Gunsmoke <input type="checkbox"/> Gt. Britain Ltd. <input type="checkbox"/> Road Runner <input type="checkbox"/>	
Missiles Control <input type="checkbox"/>	3.50
Swoop <input type="checkbox"/> Felix and the Fruit Monsters <input type="checkbox"/>	4.50
Starship Command <input type="checkbox"/> Meteors <input type="checkbox"/> Monsters <input type="checkbox"/>	7.95

ORIC	
Island of Death <input type="checkbox"/> Harrier Attack <input type="checkbox"/>	
Scuba Diver <input type="checkbox"/> Hopper <input type="checkbox"/>	3.50
Hunchback <input type="checkbox"/> Zagons Revenge <input type="checkbox"/>	4.50
Hobbit <input type="checkbox"/>	6.95

BOOKS	
Learn & Use ALP on ZX Spec <input type="checkbox"/> Invent & Write Games Spec <input type="checkbox"/>	1.99
The Sensible C.64 <input type="checkbox"/>	3.99
Graphic Art BBC <input type="checkbox"/> The Working Spectrum <input type="checkbox"/> The Working C.64 <input type="checkbox"/>	
Complete C.64 Rom Disassembly <input type="checkbox"/>	4.99

Please tick for complete list ☐ State machine

If you would like to take advantage of these unbelievably low software prices. Fill in the coupon or visit one of our local stores.

BASINGSTOKE - READING - WINCHESTER

WOKINGHAM - SALISBURY - SOUTHAMPTON

Send Order to.



MICROCHIPS
22. Winchester St.
Salisbury
Wiltshire SP1. 1HJ

Access ☐ Barclaycard ☐ VISA ☐
Name _____
Address _____

I enclose £ _____
Access/Visa No. _____

NOW
3RD
GREAT
YEAR!

HIRE
SPECTRUM
ZX81 and
COMMODORE 64
TAPES

HUGE RANGE!
ADVENTURE
GAMES
ARCADE and
SIMULATION GAMES
BUSINESS
and PRACTICAL
PROGRAMS
UTILITIES
M/C COMPILERS
EDUCATIONAL
FROM OVER
60 TOP SUPPLIERS

SPECIAL OFFER!
YOUR FIRST TWO
TAPES FREE

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

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

LIFE
MEMBERSHIP
£5.00
TAPE HIRE FROM
50P
INCLUDING VAT

OVER
1,000
DELIGHTED MEMBERS!

■ The first true software library to be set up in the world—and still the largest ■ Unrivalled tape stock, as you'd expect from our head start. ■ Run on a 16-bit micro with 10 million bytes of program and data on Winchester! aided by six less able but more friendly mere humans. ■ Often 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 peripherals 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 "Computerchat" packs in more than any mere typed newsletter. ■ Keenest-ever rates ■ ACCESS holders can join by telephone on 0730 892732 ■ NO RIVAL can offer all this....

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

NAME _____ Machine _____

ADDRESS _____

Special offer from this issue: LIFE MEMBERSHIP £5

(normally £9.50). Overseas (Europe only) £8, or join local branch in W. Germany, France, Holland, Belgium, Scandinavia, South Africa, Ireland—send Int. Reply Coupon and we'll forward your enquiry. PCWK



A bug in the works

The mystery of the unexplained crashes unravelled and solved by Andy Pennell

When writing machine-code on any machine, the QL included, it's a real nuisance when you call it and the machine just locks, with no indication of what is wrong. Unfortunately, on the current QLs this can happen even if you are a perfect programmer, as there is a bug in the Rom that can cause a *Call* command to crash the machine! However, never fear, as this little 100-odd byte machine-code routine corrects it, so that *Call* will always work as it should.

Enter Listing 1, Save it in case of errors, then Run it, and if you've got the data right then the bug is corrected. After this you can New, and it will remain, the only thing that can remove it being a Reset.

How, you may ask, can a bug in the Rom be corrected from software? Well, as you

may know, the QL keeps a list in Ram of all procedures and functions, including those in the Rom. What's required is to look in this table for *Call*, and modify the bytes that define where the procedure is, so that instead of using the erroneous routine in the Rom, the improved routine supplied is used.

Listing 2 is the assembler listing, which starts by looking in the name table for any procedures of length 4, which includes *Call*. For each one found, the following bytes are checked, and if it is indeed *Call* then the long word is re-defined. If it is not, then the whole table is scanned, and if for any perverse reason *Call* is not found then an error will occur.

The problem with the Rom routine is that Word sized addressing has been used, which is fine until you have a large Basic

program in memory of over around 25K, then it will crash. The new *Call* procedure is much the same as the old one, except that Long Word addressing is used, and that the parameters routine is accessed so that it works on all modern QL Roms. The bug exists on all QLs to date, including the latest JM version, though this correction will only work on JM and AH versions, because the vector used does not exist on earlier ones. When it gets corrected, this patch will still work, although it will be redundant.

One bug that QL owners may be interested in is the *Gosub* one — if you have a *Gosub* in a short-form For loop the *Gosub* will never be called until the loop is about to finish. As *Gosub* is not actually a procedure, it does not have its routine in Ram, so the bug can't be corrected until the next release of the Rom.

If you don't understand about QDOS or the way SuperBasic works, then look out for my forthcoming book *The QDOS Companion* available from Sunshine Books towards the end of the year.

Listing 1

```
1000 REMARK *****
1010 REMARK * CALL bug correction *
1020 REMARK *(c) Andrew Pennell 1984*
1030 REMARK *****
1040 p=RESPR(120)1050 t=0
1060 RESTORE 11301070 FOR i=0 TO 115
1080 READ a:POKE i+p,a:t=t+a1090 NEXT i
1100 IF t<>10416 THEN PRINT#0:"Data
error":STOP
1110 PRINT"Code loaded. CALL bug
corrected"
1120 CALL p
1130 DATA 32,110,0,24,50,118,136,2
```

```
1140 DATA 211,238,0,32,12,54,0,4
1150 DATA 144,0,103,0,0,14,80,136
1160 DATA 177,238,0,28,99,230,112,249
1170 DATA 78,117,12,54,0,67,144,1
1180 DATA 102,0,255,236,12,54,0,65
1190 DATA 144,2,102,0,255,226,12,54
1200 DATA 0,76,144,3,102,0,255,216
1210 DATA 12,54,0,76,144,4,102,0
1220 DATA 255,206,65,250,0,10,45,136
1230 DATA 136,4,66,128,78,117,56,120
1240 DATA 1,24,78,148,102,20,229,139
1250 DATA 103,14,215,174,0,88,47,54
1260 DATA 152,0,76,246,63,254,152,4
1270 DATA 112,241,78,117
```

Listing 2

```
*****
* CALL procedure bug correction *
*
* (c) Andrew Pennell 1984
*****

=0018          bv.ntbas equ $18
=001C          bv.nto equ $1C
=0020          bv.nibas equ $20
=0058          bv.rip equ $58

206E 0018          .      move.l bv.ntbas(a6),a0
3276 8802          loop   move.w 2(a6,a0),a1
03EE 0020          adda.l bv.nibas(a6),a1
0C36 0004 9000     cmpi.b #4.0(a6,a1,w)
6700 000E          beq coodbe
5088              next   addq.l #8,a0
B1EE 001C          cmpa.l bv.ntp(a6),a0
63E6              bls.s loop
70F9              moveq #-7,d0
4E75              rts
0C36 0043 9001     coodbe cmpl.b #'C',1(a6,a1,w)
6600 FFEC          bne next

start
name list
4 long?
could be CALL
else try next
if more
else 'not found'
is it CALL?
```



```

0036 0041 9002      cmpi.b #'A'.2(a6,a1.w)
6600 FFE2           bne next
0036 0040 9003      cmpi.b #'L'.3(a6,a1.w)
6600 FFD8           bne next
0036 0040 9004      cmpi.b #'L'.4(a6,a1.w)
6600 FFCE           bne next

      * it is so redefine it

41FA 000A           lea newcall(pc),a0
2D80 8004           move.l a0,4(a6,a0.l)      store new address
4280               clr.l d0                  no error
4E75               rts                      back to BASIC

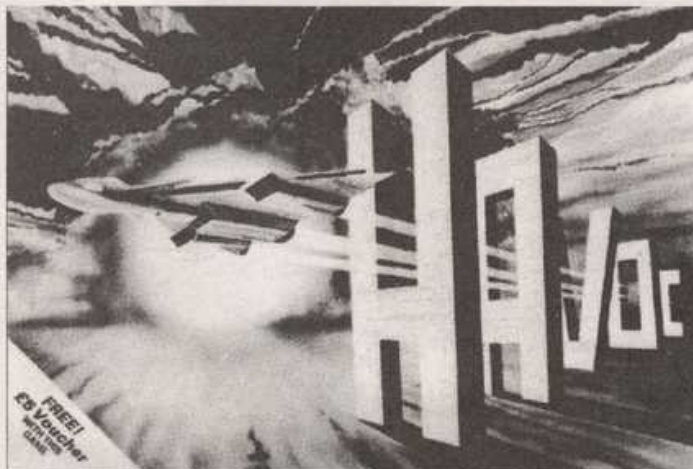
      * new CALL procedure

3878 0110          newcall move.w $118,a4
4E74               jsr (a4)                  get parameters
6614               bne.s exit                if error
E58B               lsl.l #2,d3
670E               beq.s badparam           if no params
D7AE 0058          add.l d3,bv.rip(a6)      redo maths stack

      * these next two are wrong in the ROM

2F36 9800          move.l 0(a6,a1.l),-(a7)   start address
4CF6 3FFE 9804     movem.l 4(a6,a1.l),a0-a5/d1-d7 and registers
70F1              badparam moveq #-15,d0     ready to go to it
4E75              exit      rts              start it (or quit)

```



PLAY HAVOC WITH YOUR COMPUTER

*"Possibly the ultimate challenge for arcade fans,
and a brilliant piece of programming"*

Commodore Horizons
Nov. 1984

HERE'S A VERY SPECIAL OFFER TO HELP YOU!

FREE £5
VOUCHER
WITH EVERY GAME

FREE FULL
COLOUR
A3 POSTER

FREE HAVOC
MOBILE

FREE GIFT
SOFTWARE
OF AT LEAST
£5.95 R. P.

HAVOC for the CBM 64 — £9.95

HAVOC for the SPECTRUM — £7.95

• • •

Available from all leading computer stores and
retailers, including W.H. Smith, Boots, John
Menzies, Spectrum Group, etc.

To take advantage of this special offer, send cheque or
P.O. to **Dynavision, P.O. Box 96, Luton LU3 2JP.**
Credit card orders to **0582-595222 (24 hrs.)**

Please send me a copy of HAVOC ☐ CBM 64
☐ Spectrum

Name

Address

.....

.....

SUMMER GAMES

THE TOP U.S. AND U.K. OLYMPIC GAMES PROGRAM

You're an Olympic athlete competing in eight key events at the SUMMER GAMES.

How well can you score in track, swimming, diving, shooting, gymnastics and more? So realistic, there's even an opening ceremony and awards presentation after each event.

Unlike other "Olympic-like" games, SUMMER GAMES has incredible realism, superb state-of-the-art graphics and sound effects, including national anthems from eighteen countries and true action-strategy game play. In each event you must plan and execute your game strategy in order to maximise your score. It's not just a matter of how fast you can move the joystick.

So change into your running shoes, grab your joystick and GO FOR THE GOLD!

QUICKSILVA PRESENTS

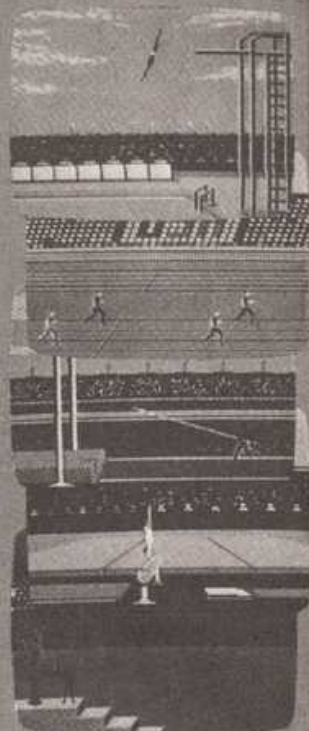


SUMMER GAMES

From

EPYX
COMPUTER SOFTWARE

COMMODORE 64 DISK



£14.95

Commodore 64
Turbo load

£19.95

Commodore 64 Disk

QUICKSILVA PRESENTS



A REAL TIME ACTION INTERACTIVE FILM
NORMAN THE WARRIOR IN
CASTLE OF JASOOM
38 DIFFERENT SCREENS OVER 200 ROOMS
FULL GRAPHICS ARCADE ACTION

COMMODORE 64 + JOYSTICK
DISK SOFTWARE FROM ACCELERATED SOFTWARE INC.

Marketed Exclusively in the UK
under licence from CBS/EPYX BY
QUICKSILVA LTD. ▲

The ultimate in graphics!

Commodore 64
Disk £14.95

Commodore 64 ▼
Turbo load £7.95

QUICKSILVA PRESENTS



COMMODORE 64
UR SKET
By Mark W. Rich
IF YOU GO DIF
THROST PRIN

QUICKSILVA PRESENTS
THE
MAGIC MICRO MISSION

QUICKSILVA PRESENTS



A REAL TIME ACTION INTERACTIVE FILM
NORMAN THE WARRIOR IN
DUNGEONS OF BA
38 DIFFERENT SCREENS 200 ROOMS
FULL GRAPHICS ARCADE ACTION
COMMODORE 64 + JOYSTICK
DISK SOFTWARE FROM ACCELERATED SOFTWARE INC.

Commodore 64 Disk £12.95

Two adventures with real time
action, unbelievable
excitement!

◀ Commodore 64 Disk £12.95



Strontium 90
Turbo Load
COMMODORE 64 + JOYSTICK



MAGIC MICRO MISSION
PARTS 1 + 2
Turbo Load
COMMODORE 64 + JOYSTICK

£7.95

Two games
for the price of one!
Commodore 64 Turbo load

Based on Central Independent Television Series.

QUICKSILVA

All titles available from Quicksilva Mail Order, PO Box 6, Wimborne Dorset BA21 7PY. Tel (0202) 891744.

389 DATA	0C,0C,0C,0C,03,30,00,C0,00,C0,00,C0,00,C0,00,00,00,00,00,00,00,
00,00,00	
390 DATA	0F,FC,00,0C,00,30,00,C0,03,00,0C,00,0F,FC,00,00,00,00,00,00,00,
00,00,00	
391 DATA	3F,FC,3C,00,3C,00,3C,00,3C,00,3C,00,3F,FC,00,00,00,00,00,00,00,
00,00,00	
392 DATA	00,00,30,00,0C,00,03,00,00,C0,00,30,00,0C,00,00,00,00,00,00,00,00,
00,00,00	
393 DATA	0F,FC,00,3C,00,3C,00,3C,00,3C,00,3C,0F,FC,00,00,00,00,00,00,00,
00,00,00	
394 DATA	00,C0,03,F0,0C,CC,00,C0,00,C0,00,C0,00,00,00,00,00,00,00,00,00,
00,00,00	
395 DATA	00,00,03,00,0C,00,3F,FC,0C,00,03,00,00,00,00,00,00,00,00,00,00,
00,00,00	
396 DATA	03,00,03,00,03,00,03,00,30,30,0F,C0,03,00,00,00,00,00,00,00,00,00,
00,00,00	
397 DATA	00,00,00,00,03,C0,0C,30,0C,30,0C,30,03,CC,00,00,00,00,00,00,00,00,
00,00,00	
398 DATA	0C,00,0C,00,0F,C0,0C,30,0C,30,0C,30,0F,C0,00,00,00,00,00,00,00,
00,00,00	
399 DATA	00,00,00,00,03,C0,0C,30,0C,00,0C,30,03,C0,00,00,00,00,00,00,00,
00,00,00	
400 DATA	00,30,00,30,03,F0,0C,30,0C,30,0C,30,03,F0,00,00,00,00,00,00,00,00,
00,00,00	
401 DATA	00,00,00,00,03,C0,0C,30,0F,C0,0C,30,03,C0,00,00,00,00,00,00,00,00,
00,00,00	
402 DATA	03,C0,0C,30,0C,00,0F,C0,0C,00,0C,00,0C,00,00,00,00,00,00,00,00,
00,00,00	
403 DATA	00,00,00,00,03,C0,0C,30,0C,30,03,F0,00,30,00,30,0C,30,03,C0,00,
00,00,00	
404 DATA	0C,00,0C,00,0F,C0,0C,30,0C,30,0C,30,00,00,00,00,00,00,00,00,00,
00,00,00	
405 DATA	00,00,03,00,00,00,03,00,03,00,03,00,03,00,00,00,00,00,00,00,00,
00,00,00	

```

406 DATA 00,00,00,30,00,00,00,30,00,30,00,30,00,30,00,30,0C,30,03,
C0,00,00
407 DATA 0C,00,0C,00,0C,30,0C,C0,0F,00,0C,C0,0C,30,00,00,00,00,00,00,
00,00,00
408 DATA 0C,00,0C,00,0C,00,0C,00,0C,00,0C,00,00,00,00,00,00,00,00,00,
00,00,00
409 DATA 00,00,00,00,0F,3C,30,C3,30,C3,30,C3,30,C3,00,00,00,00,00,00,00,
00,00,00
410 DATA 00,00,00,00,03,C0,0C,30,0C,30,0C,30,0C,30,00,00,00,00,00,00,00,
00,00,00
411 DATA 00,00,00,00,03,C0,0C,30,0C,30,0C,30,03,C0,00,00,00,00,00,00,00,
00,00,00
412 DATA 00,00,00,00,03,C0,0C,30,0C,30,0C,30,0F,C0,0C,00,0C,00,0C,00,0C,
00,00,00
413 DATA 00,00,00,00,03,C0,0C,30,0C,30,0C,30,03,F0,00,30,00,30,00,3C,00,
30,00,00
414 DATA 00,00,00,00,03,C0,0C,30,0C,00,0C,00,0C,00,00,00,00,00,00,00,00,
00,00,00
415 DATA 00,00,00,00,03,C0,0C,30,03,C0,0C,30,03,C0,00,00,00,00,00,00,00,
00,00,00
416 DATA 0C,00,0C,00,0F,C0,0C,00,0C,00,0C,30,03,C0,00,00,00,00,00,00,00,
00,00,00
417 DATA 00,00,00,00,0C,30,0C,30,0C,30,0C,30,03,C0,00,00,00,00,00,00,00,
00,00,00
418 DATA 00,00,00,00,0C,30,0C,30,0C,30,0C,30,03,C0,00,00,00,00,00,00,00,
00,00,00
419 DATA 00,00,00,00,30,C3,30,C3,30,C3,30,C3,0F,3C,00,00,00,00,00,00,00,
00,00,00
420 DATA 00,00,00,00,0C,30,0C,30,03,C0,0C,30,0C,30,00,00,00,00,00,00,00,
00,00,00
421 DATA 00,00,00,00,0C,30,0C,30,0C,30,0C,30,03,F0,00,30,00,30,0C,30,03,
C0,00,00
422 DATA 00,00,00,00,0F,F0,00,30,00,C0,03,00,0F,F0,00,00,00,00,00,00,00,
00,00,00
423 DATA **

```

```
100 ' LISTING 6
110 '
120 'Prints out the full character set.
130 '
140 CLEAR 200,&H72BF
150 DEFUSR0=&H7E20
160 PMODE3:PCLS:SCREEN1,0
170 X=0:Y=2
180 FOR A=32 TO 122
```

```

190 A$=CHR$(A)
200 GOSUB 230
210 NEXT
220 GOTO 220
230 A$=A$+CHR$(13)
240 POKE &H7E22,X:POKE &H7E23,Y
250 N=USRO (VARPTR(A$))
260 X=X+1:IF X>15 THEN X=0:Y=Y+1
270 A$="":RETURN

```

REAL ARCADE ACTION! FROM JETSOFT



BMX STUNTS

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



Cavelon II

hand in this all thrills, all action, real arcade game, when excalibur appears, achieve indestructibility



Quarri

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

FAST LOAD
1 1/2 minutes

All 3
games for
Commodore
64

061-775 0333 *the arcade people*

JetSoft

THE MICRODEAL WONDERLAND

These terrific games from Microdeal are available in Tandy Shops Nationwide for the

Tandy

TRS 80™ COLOUR COMPUTER

Meet our hero 'Cutbert' Fight Deadly Katterpillars, Steer Danger Ranger through the Deadly Chambers of Pasho, Fight Deadly Seals with Pengon the Penguin or play real time adventures with the Keys of the Wizard. It's all there with Microdeal games.

Some games require Extended Basic, 32K Memory, Joysticks. Check with your local Tandy Store for details.



ALL THESE GREAT GAMES PLUS MANY MORE ARE EXCLUSIVELY AVAILABLE FROM OVER 350 TANDY STORES & DEALERS NATIONWIDE

GAMES CASSETES

£7.95

EXCEPT COMPOSER £14.95



Tandy

TRS-80 COLOUR COMPUTER

The TRS-80 Colour Computer is ideal for anybody who wants to enjoy video games in a system that can be used for many other household, business and educational tasks. It's great for beginners who want a computer that's easy to learn on - but not limiting. And it's perfect for hobbyists who want a full-featured system with the opportunity for advanced machine and communication expansion.

TANDY & TRS 80 ARE REGISTERED TRADE MARKS OF THE TANDY CORPORATION



MICRODEAL

41 Truro Rd, St. Austell Cornwall PL25 5JE
Phone 0726 3456

The electronic banker

This week, Banker, a program taken from David Lawrence's new book on the C16

The object of this program is to allow the user to keep a clear and continuously updated record of a single bank account, the names of payments, their date and the amount, including the ability to specify not only single payments, but recurring expenses or receipts, no matter how irregular the period. The program is designed to deal with an account for the period of one calendar year, though if a great many transactions are involved, limitations of memory may mean that you will need to start afresh with a new record every few months.

Program Notes

Line 10060: The array A\$ will be used to store the names of payments and special string, explained later, which records the months in which the particular payment is made. The numerical array A will store the amount of each payment and the day of the month on which it is made. The setting of A(0,1) to 999, an impossible day of the month, is used by the later sorting routine to detect the end of the file.

Lines 10080-10130: This loop reads the names of the months of the year into the array MOS\$

Lines 11000-11200: Standard menu module.

Lines 12030 and 12260: The overall loop which allows the user to confirm or reject the information input.

Line 12060: The program clearly needs to know whether the item is to be paid out or received, debit or credit. This is recorded in the form of the variable CD (Credit/Debit).

Lines 12090-12220: The months in which the payment is to be made are input in the form of a string of two digit numbers, with no separation between them. The For loop beginning at line 12130 scans the string input to make sure that it does yield a series of sensible month values and informs the user if an error has been made.

Line 12220: At this point, the information input has been checked and confirmed by the user, so the variable recording the number of items in the file, PA, is incremen-

ted by one.

Lines 12290-12360: The purpose of this loop is to place the new item into correct day order within the file. Rather than make duplicate copies of payments which fall in more than one month, the system adopted is to store all of the entries once only, in day order. When inserting the new item, the loop from 12290 to 12350 starts with the highest day value (which is the dummy 999 inserted in the initialisation module) and works its way down until it finds a payment with a day value less than the value of S, the day value of the item just input by the user. If it does not find the correct position it moves the item it has just examined up one place, in other words, as it scans down the file, moving a spare line with it. When the correct position is found, the spare line is already in the correct position. As a final action, the value of J, which records the position of the first entry found which has a day of payment less than S, is increased by one to point to the spare line.

Lines 12370-12410: The next task is to translate the list of months input into a format which can easily be scanned by later parts of the program. The simple expedient adopted is to use a string of 12 zeros, recording months in which the payment is not to be made, and then to use a loop to change a zero to one, for any months in

```

      august
balance c/f: 456.00      Item      Total
1    salary      333.00    789.00
1    mortgage    225.00    564.00
15   gas        150.00    414.00

any key to continue:

10000 REM*****
10010 REM VARIABLES
10020 REM*****
10030 SCNCLR
10040 DO WHILE IN=0
10050 IN=1 : CR=CHR$(13) : S$="vvvvv"
10060 DIM A$(99,1),A(99,1):A(0,1)=999
10070 RESTORE
10080 DIM MOS$(11)
10090 FOR I=0 TO 11
10100 READ A$:MOS$(I)=A$
10110 NEXT I
10120 DATA JANUARY,FEBRUARY,MARCH,APRIL,MAY,J
UNE,JULY,AUGUST,SEPTEMBER,OCTOBER
10130 DATA NOVEMBER,DECEMBER
10140 INPUT "DO YOU WISH TO LOAD FROM DISK (Y/N)";Q$
10150 IF Q$="Y" THEN GOSUB 15150
10160 LOOP
11000 REM*****
11010 REM MENU
11020 REM*****
11030 Z=0 : DO UNTIL Z=5
11040 COLOR 0,8 : SCNCLR : CHAR,16,1,"
[RVS ON][RED]BANKER[GRN]" : PRINT
11050 PRINT "[CD][CD][BLK]vCOMMANDSvAVAILABL
E:"
11060 PRINT "[CD][GRN]vvvvv1)NEWvPAYMENTS"
11070 PRINT "[CD]vvvvv2)EXAMINE/DELETEvPAYMEN
TS"
11080 PRINT "[CD]vvvvv3)PRINTvSTATEMENT"
11090 PRINT "[CD]vvvvv4)SAVEvFILE"
11100 PRINT "[CD]vvvvv5)STOP"
11110 INPUT "[CD][CD][BLK]vWHICHvDOvYOUvREQU
IRE:";Z:PRINT ""
11120 DO WHILE PA=0 AND (Z=2 OR Z=3)
11130 PRINT "[CD][CD][CD][CD][CD][CR][CR][CR]
[CR][CR][CR]SORRY,vNOvDATAvYET." : GETKEY A$
11140 Z=0

```

```

11150 EXIT : LOOP
11160 ON 2 GOSUB 12000,13000,14000,15000
11170 LOOP
11180 SCNCLR : CHAR,16,10,"[RVS ON][RED]BANKE
R"
11190 CHAR,10,12,"[RVS OFF][BLK]CLOSEDvFORvBU
SINESS"
11200 END
12000 REM*****
12010 REM ENTER NEW ITEMS
12020 REM*****
12040 SCNCLR : CHAR,16,1,"[RED][RVS ON]NEWvIT
EMS[GRN][RVS OFF]" : PRINT
12050 PRINT "[CD][CD]vvvvv1)CREDIT":PRINT "v
vvvvv2)DEBIT"
12060 INPUT "[CD][BLK]vWHICHvDOvYOUvREQUIRE:
";CD:CD=CD-1
12070 INPUT "[CD][CD][GRN]vNAMEvOFvPAYMENT:";
Q$
12080 INPUT "[CD]vAMOUNT:";Q
12090 EN=1 : DO UNTIL EN=0
12100 EN=0
12110 INPUT "[CD]vMONTHSv(E.G.v01040710):";R$
12120 PRINT "[CU]";
12130 FOR I=1 TO LEN(R$) STEP 2
12140 M=VAL(MID$(R$,I,2))-1
12150 DO UNTIL M=>0 AND M<=11
12160 PRINT : PRINT "[CU]INVALIDvMONTHvINPUTv
vvvvvvvvvvvvvvvvvvvvvv[CU][CU]"
12170 EN=1
12180 GETKEY A$
12190 EXIT : LOOP
12200 IF EN=0 THEN PRINT MOS$(M);"/";
12210 NEXT I
12220 LOOP
12230 PRINT "vvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvv
vvvvvvvv"
12240 INPUT "[CD]vDAYvOFvPAYMENT:";S
12250 INPUT "[CD][CD][RED]AREvTHESEvCORRECTv(
Y/N)";T$
12260 IF T$<>"Y" THEN RETURN
12270 PA=PA+1
12280 J=PA-1
12290 DO WHILE S<A(J,1)
12300 FOR K=0 TO 1

```


which a payment is to be made. Thus, in the case of our quarterly example above, the eventual string would read 010010010010. **Lines 12420-12450:** The new information is placed into the main arrays. If the variable CD records that the item is a debit, the amount is multiplied by minus one, making it negative.

Line 14030: The variable *Sum* will be used to hold the balance in the account — both the balance carried forward and the balance after each item.

Lines 14080-14130: Provided that the statement is not for the first month, in which case there is no balance to be carried forward, these two loops scan the whole of the payments list once for each month which precedes the month of the statement. In this way, each payment is examined to see whether it is made in any of the preceding months, in which case the appropriate

amount is added to the total in *Sum* by the end of the two loops, *Sum* contains the full total of any changes in the balance since the beginning of the year.

Lines 14160-14170: One thing to note about the printing of *Sum* at this point is that if the amount is negative, Line 14060 changes the print colour to red. You will find the same techniques used frequently in the lines that follow. Note also the use of the *Print Using* command, allowing us to impose a standard format on the number to be printed and ensuring that the statement will be neatly presented, with all the decimal points aligned.

Lines 14190-14310: This loop scans through the complete list of payments, while the *Do* loop at 14200 and 14300 selects only those which have a 1 in the relevant position of the string recording the months in which the payment is to be made. When a payment

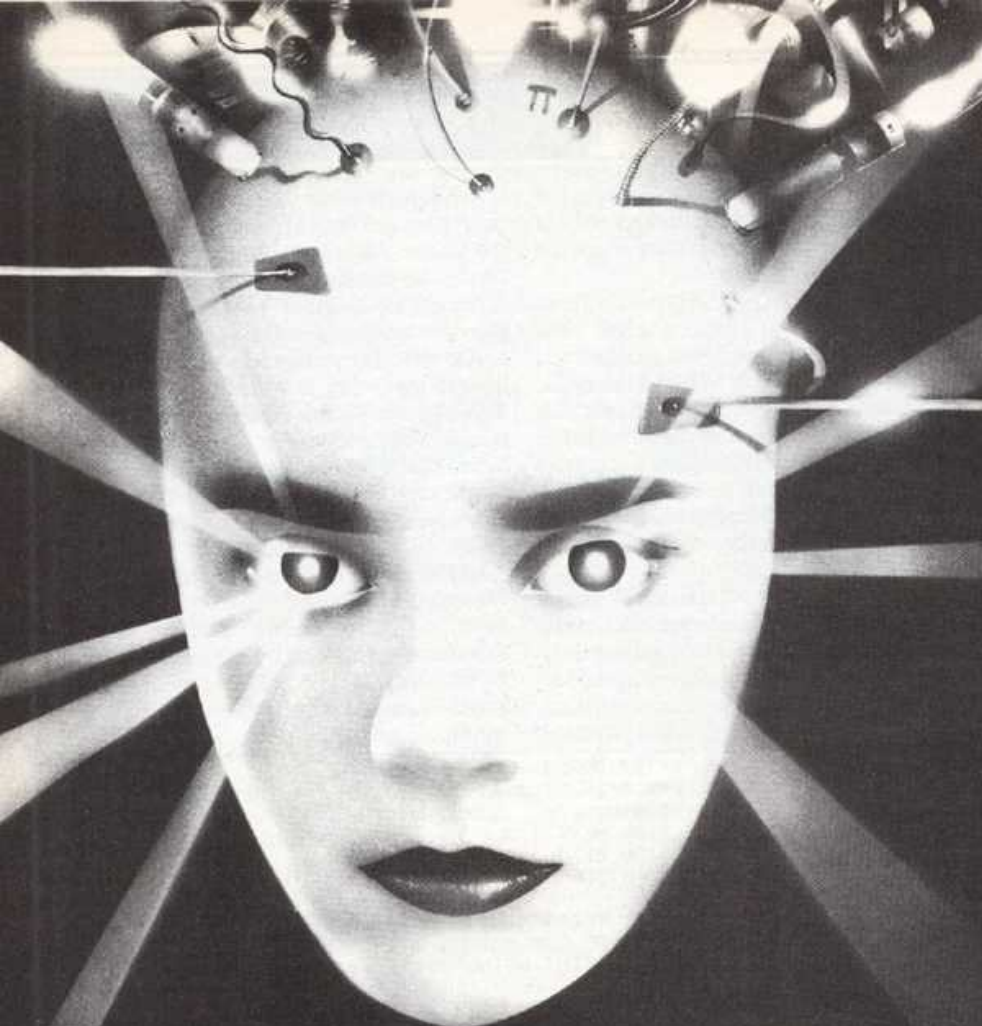
is to be made in the month specified for the statement, the loop prints out the day, *A(I,1)*, the name, *A\$(I,0)*, the amount, *A(I,0)*, and finally the balance the payment produces, obtained by adding the amount to the previous total in *Sum*. The screen is maintained in orderly columns, despite the fact that figures may vary in length, by the use of *Tab*, which starts items at a standard position on the screen, and *Print Using*.

Lines 15000-15260: Data Files routine. The program is disc based, but can be converted to tape filing by changing Line 15090 to *Open 1,1,1,FI\$* and Line 15210 to *Open 1,1,0,FI\$*, then *15080 to FI\$ = FI\$ + "S,W"*. This program is an edited abstract from *The Working Commodore C16* by David Lawrence (published by Sunshine Books at £6.95). Greater detail of the program itself and the principles it embodies can be found within its pages.

```

12310 A$(J+1,K)=A$(J,K)
12320 A(J+1,K)=A(J,K)
12330 NEXT K
12340 J=J-1 : IF J<0 THEN EXIT
12350 LOOP
12360 J=J+1
12370 A$(J,1)="000000000000"
12380 FOR I=1 TO LEN(R$) STEP 2
12390 M=VAL(MID$(R$,I,2))
12400 A$(J,1)=LEFT$(A$(J,1),M-1)+"1"+RIGHT$(A$(J,1),12-M)
12410 NEXT I
12420 A$(J,0)=Q$
12430 A(J,0)=Q
12440 A(J,1)=S
12450 IF CD=1 THEN A(J,0)=A(J,0)*-1
12460 RETURN
13000 REM*****
13010 REM EXAMINE/DELETE ITEMS
13020 REM*****
13030 FOR I=0 TO PA-1
13040 COLOR 1,1 : SCNCLR
13050 PRINT "[CD]PAYMENT:";A$(I,0)
13060 PRINT "[CD]AMOUNT:";A(I,0)
13070 PRINT "[CD]MONTHS:"
13080 FOR J=1 TO 12
13090 IF MID$(A$(I,1),J,1)="1" THEN PRINT MO$(J-1);"/";
13100 NEXT J : PRINT
13110 PRINT "[CD]DAY OF PAYMENT:";A(I,1)
13120 PRINT "[CD][CD][CD][RED][RVS ON]COMMAND S$AVAILABLE:[RVS OFF][BLU]"
13130 PRINT "[CD][RVS ON]RETURN[RVS OFF]Q-ONE XT$ITEM":
13140 PRINT "[RVS ON]ZZZ[RVS OFF]Q-QUIT"
13150 PRINT "[RVS ON]ZERO[RVS OFF]Q-DELETE$ITEM"
13160 Q$="" : INPUT "[CD][GRN]WHICH DO YOU REQUIRE:";Q$
13170 DO WHILE Q$="0"
13180 FOR J=1 TO PA-1
13190 FOR K=0 TO 1
13200 A$(J,K)=A$(J+1,K) : A(J,K)=A(J+1,K)
13210 NEXT K,J
13220 PA=PA-1
13230 EXIT : LOOP
13240 IF Q$="" THEN NEXT I
13250 RETURN
14000 REM*****
14010 REM COMPILE STATEMENT
14020 REM*****
14030 SUM=0
14040 SCNCLR : CHAR,15,1,"[RED]STATEMENT[BLK]" : PRINT
14050 Q=0 : DO UNTIL Q>0 AND Q<13
14060 INPUT "[CD]NUMBER OF MONTH FOR STATEMENT:";Q
14070 LOOP
14080 DO WHILE Q<1
14090 FOR J=1 TO Q-1
14100 FOR I=0 TO PA-1
14110 IF MID$(A$(I,1),J,1)="1" THEN SUM=SUM+A(I,0)
14120 NEXT I,J
14130 EXIT : LOOP
14140 SCNCLR : CHAR,15,1,"[RED]" : PRINT MO$(Q-1)
14150 PRINT "[CD][BLK]BALANCE OF:";
14160 IF SUM<0 THEN PRINT "[RED]";
14170 PRINT USING "#####";ABS(SUM)
14180 CHAR,26,3,"[GRN][RVS ON]ITEM[CR][CR][CR]TOTAL[RVS OFF]" : PRINT "[CD]"
14190 FOR I=0 TO PA-1
14200 DO WHILE MID$(A$(I,1),Q,1)="1"
14210 PRINT "[BLK]"; : PRINT USING "###";A(I,1) : PRINT "Q-";
14220 IF A(I,0)<0 THEN PRINT "[RED]";
14230 PRINT LEFT$(A$(I,0),15);
14240 PRINT TAB(23);
14250 PRINT USING "#####";ABS(A(I,0));
14260 SUM=SUM+A(I,0)
14270 PRINT "Q[BLK]";
14280 IF SUM<0 THEN PRINT "[RED]";
14290 PRINT USING "#####";ABS(SUM)
14300 EXIT : LOOP
14310 NEXT I
14320 PRINT "[CD]ANY KEY TO CONTINUE:"
14330 GETKEY A$
14340 RETURN
15000 REM*****
15010 REM DATA FILES
15020 REM*****
15030 Q$="" : DO UNTIL Q$="Y"
15040 INPUT "[CD]NAME OF FILE TO BE SAVED:";FI$
15050 PRINT "[CD]FILE TO BE SAVED IS FI$
15060 INPUT "[CD]IS THIS CORRECT (Y/N):";Q$
15070 LOOP
15080 FI$="00:"+FI$+"S,W"
15090 OPEN 1,0,2,FI$
15100 PRINT#1,PA
15110 FOR I=0 TO PA-1
15120 PRINT#1,A$(I,0);CR$;A$(I,1);CR$;A(I,0);CR$;A(I,1)
15130 NEXT I
15140 CLOSE1 : RETURN
15150 Q$="" : DO UNTIL Q$="Y"
15160 INPUT "[CD]NAME OF FILE TO BE LOADED:";FI$
15170 PRINT "[CD]FILE TO BE LOADED IS FI$
15180 INPUT "[CD]IS THIS CORRECT (Y/N):";Q$
15190 LOOP
15200 FI$="00:"+FI$+"S,R"
15210 OPEN 1,0,2,FI$
15220 INPUT#1,PA
15230 FOR I=0 TO PA-1:INPUT#1,A$(I,0);A$(I,1);A(I,0);A(I,1):NEXT I
15240 A(PA,1)=999
15250 CLOSE1
15260 RETURN

```

AUTOMATA U.K. PRESENTS
YOURSELF
IAN DURY
JON PERTWEE
MEL CROUCHER
DONNA BAILEY
and FRANKIE HOWERD in

DEVS EX MACHINA

WRITTEN AND DIRECTED BY MEL CROUCHER

AUTOMATA thanks everyone who has taken DEUS EX MACHINA to their hearts . . . reviewers, wholesalers, retailers, the media, and most important of all, our public . . .
THANK YOU !

(Barry Norman, Radio 4)
"Perfection, the aim of all of us!"

(Popular Computing Weekly)
"a completely new computer experience, rare and truly great!"

(Dave Freeman, Radio 1)
"You've got to play it to believe it! This will get to Number One!"

(Computer & Video Games)
"The most original concept since the Spectrum was a gleam in Clive Sinclair's eye. The computer equivalent of Pink Floyd's The Wall . . ."

(Thorn EMI)
"The first computer program to inspire a cult following. To be without it is to lose social standing!"

(Crash Magazine)
"There are few things in life that can be called global certainties . . . this is one of them! Hypnotic, emotive, noble, humorous, absolutely excellent . . ."

(Home Computing Weekly)
"To call this a game is an insult. It's a stunning and profound audio-visual experience."

Instructions	100%
Playability	100%
Graphics	100%
Value for money	100%"

DEUS EX MACHINA —
Amstrad and Commodore 64
versions available soon!

CRUSOE 48K Spec £6 <input type="checkbox"/>	DEUS EX MACHINA 48K Spec £15 <input type="checkbox"/>	PIMANIA 48K Spec £10 <input type="checkbox"/>
PI-EYED 48K Spec £6 <input type="checkbox"/>	GO TO JAIL 48K Spec £6 <input type="checkbox"/>	OLYMPIANIA 48K Spec £6 <input type="checkbox"/>
PIROMANIA 48K Spec £6 <input type="checkbox"/>		PI-BALLED 48K Spec £6 <input type="checkbox"/>
PI-IN'ERE 48K Spec £6 <input type="checkbox"/>	MORRIS MEETS THE BIKERS . . Any Spec £6 <input type="checkbox"/>	DARTZ 48K Spec £5 <input type="checkbox"/>
YAKZEE . . Dragon/48K Spec £5 <input type="checkbox"/>	PIMANIAC T-SHIRTS (state size) Price £5 <input type="checkbox"/>	NEW WHEELS JOHN? 48K Spec £5 <input type="checkbox"/>
'BACKCHAT' Speech Synth. CBM64 with Software & Programming Book £25 <input type="checkbox"/>		Piman's Stereo L.P. Cassette . . . £3 <input type="checkbox"/>
PIMANIACS CLUB for 20% off all products, etc. Annual Subscription UK £5 <input type="checkbox"/> Overseas £7 <input type="checkbox"/>		Piman's Greatest Hits Vol. 2 . . . £3 <input type="checkbox"/>

I enclose the right money, or debit my ACCESS/VISA Card. My Card number is Expiry Date.....
Card holder's signature Card holder's name Tel. Number.....
Card holder's address
..... Post Code

NO EXTRAS! All our prices include VAT and Postage & Package. 24 hr.—CREDIT CARD HOT LINE (0705) 735242.
Send your order and payment to: AUTOMATA U.K. LTD. 27 HIGHLAND ROAD, PORTSMOUTH, HANTS. PO4 9DA, ENGLAND.

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.

Colour Demo

on Amstrad

The Amstrad CPC464 supports the use of text and graphics windowing very well. Here is a very primitive implementation of same and the listing is therefore short. However it does some justice to the power and versatility of the on board language.

```
1 *****
2 *****
3 *** PAUSE DEMO OF COLOURS ***
4 *****
5 *****
10 KEY 135, "paper Bopen 1: ink 1, 0: ink 0, 2: order 2: mode 1: list: CHR$(13)
20 KEY 136, "mode 2: list: CHR$(13)
30 MODE 0
40 SPEED INK 10, 10
50 FOR u=0 TO 7:
60 WINDOW u, 2: u, 13: u, 2: u, 29: u
70 PAPER u, 15: u: CLR u
80 NEXT
90 FOR a=0 TO 15: INK a, RND*255, RND*255: NEXT
100 BORDER RND*255, RND*255
110 FOR d=1 TO 3000: NEXT
120 FOR a=0 TO 15: INK a, RND*255: FOR d=1 TO 3000: NEXT: BORDER RND*255
130 FOR b=0 TO 255: FOR d=1 TO 1000: NEXT: NEXT
140 LOCATE 4, 10: PRINT "Gives Delight" : FOR d=1 TO 1000: NEXT
150 CLR: PRINT: "This is a demo of colours"
160 FOR d=1 TO 3000: NEXT
170 CLR: PRINT: "This is another demo of the colours"
180 FOR d=1 TO 2000: NEXT: CLR: CLR
190 FOR a=1 TO 300 STEP 2
200 DEG
210 ORIGIN 100, 100
220 PLOT 150: COS(a), 150: SIN(a), 1
230 DRAW 0, 10, 2: DRAW 10, 0, 0
240 DRAW 100: COS(a/2), 50: SIN(a), RND*255: DRAW 100: SIN(a/2), 100: COS(a/2), 0
250 NEXT
260 FOR u=7 TO 0 STEP -1
270 FOR i=1 TO 6: PRINT u: NEXT: NEXT
280 PRINT CHR$(2): GOTO 30
290 DONE 2: MODE 1: FOR p=1 TO 9: OPEN p: FOR a=1 TO 255: PRINT CHR$(13): CHR$(a): NEXT
NEXT
300 GOTO 30: mode=0
```

Colour Demo
by D Race

Arcade Avenue



High scores

This week some general letters and I was pleased to hear again from the mysterious Ensor from "somewhere in England" (who is that masked man?) whose best at *Full Throttle* is first place on four laps of Silverstone by 32.40 seconds. "I find it helpful to write down the corners so that I know what's coming up and get into the right place; eg, Silverstone R-L-R-L-R-R-L-R. A different sign can be included to indicate whether it needs the use of brakes. I am now concentrating on the Donning-

ton circuit, but so far I have only come seventh.

"In TLL the highest number of targets I've managed to destroy is 40 with a score of 20732, although I have a higher score of 20928 for 38 targets. It can be a frustrating game as the targets become extremely difficult to destroy the further you get into the game. Does anyone know how many there are?"

Anthony Rowstron of Harpendon has a high score of 129,440 on Level 13 of *Zzoom* which has been witnessed and verified by his mum which puts it beyond question. No decadent cheating in their household!

A Taylor of St Helens has stopped the express on Sinclair's game with a score of 5910, but has been pipped by either S Moran and N Dunbar of Newport, one of whom writes "I have completed Stage One of *Stop the Express* and finished

with a score of 6450. My highest score on *Sabre Wulf* is 222,878 and 93%. I suspect the latter score may have been achieved using their infinite lives poke but they don't say.

M Taylor of R.A.F. Kinloss asks for help getting through the flashing gate after completing the Processing Plant screen of *Manic Miner*. It is a long while since I have had time to play this game, but as I remember it you have to stand on the ledge on the left of the gate and edge your foot over as far as it will go before jumping.

Finally, this week comes a letter from some people trying to put me and Tony Bridge out of business. "We are creating a service that is directed to arcade (and adventure) fans everywhere. It will provide hints, tips, maps and infinite lives codes. Already we have got maps for *Sabre Wulf* and *Atic Atac*, as well as *Moon Alert*, *Tranz AM*, *JSW*, *Manic Miner*,

the Horace series, *Lunar Jetman* and many more. We will publish a newsletter every two months that will contain loads of information for the members. People will be able to have a say as well as publish their own tips and scores. We will have prizes for the best scores such as new games and pop videos, etc. Subscription is £3.50 (incl p&p) for the first year or 70p for the first newsletter and details of how to join."

If you are interested the address is I.A. Robinson, 33 Western Avenue, Prudhoe, Northumberland.

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.

Timer on Dragon

Your eyes flash repeatedly from keyboard to screen and back. Time flies by unnoticed as the data gradually fits into place. At last, there's the answer! Then the aftermath strikes. You have missed the train home, the shops are shut and your dinner is burnt to a crisp.

Don't despair, here is the answer to your

troubles. The routine below presents a clock display apparently running simultaneously with the main program.

For your own use, enter all units except the demonstration text, then liberally scatter *Gosub 350* throughout the main program. Precise spacing of the *Gosub* statements is not required since the clock is self-correcting. Machine code clear routines are provided, but remember to use *Print@* for the top line of your main display and to avoid scrolling.

The timer check in *Line 350* may require slight alteration depending on the exact pulse rate of your Dragon.

Program notes

130-140 Save space and read machine code
180-270 Input time from keyboard
310-330 Divide screen
340 Clear clock screen and zero timer
350 Check for a minute to pass
260-410 Format clock display
450 Clear main screen
460-570 Main demonstration program
610-670 Machine code screen clear

```
10 *****
20 * 24HOUR CLOCK *
30 * TO INCLUDE *
40 * IN YOUR PROG *
50 * --- *
60 * WRITTEN BY *
70 * BRIAN HATTON *
80 * (C) 1981 *
90 *****
100 *****
110 * INITIALISE *
120 *****
130 CLEAR 200:32500
140 I=0:GOSUB 610
150 *****
160 * SETTING *
170 *****
180 CLS
190 PRINT"SET 24-HOUR
200 * FROM KEYBOARD *
210 I=I+1:IF I=14 THEN G
220 SUB 310:GOTO 460
230 IF INKEY$="" THEN
240 GOTO 210
250 IF I=1 THEN H=I+1
260 P=0
270 IF I=2 THEN H=VAL(H
280 +VAL(I)):H=STR$(H
290 )
300 IF I=3 THEN M=I+1
310 P=0
320 IF I=4 THEN M=VAL(M
330 +VAL(I)):M=STR$(M
340 )
350 IF I=5 THEN PRINT"
360 * * * * *
370 GOTO 280
380 PRINT" * * * * *
390 GOTO 280
400 *****
410 * DISPLAY *
420 *****
```

```
310 FOR J=32 TO 63
320 PRINT@J,CHR$(13)
330 NEXT J
340 EXEC 327F5:TIMER=0
350 IF TIMER>3000-E THEN
360 E=TIMER-3000:E=M+VAL(M
370 +1):H=STR$(M):GOTO 340
380 IF VAL(M)=60 THEN M
390 =0:H=VAL(H)+1:H=ST
400 R$(H)
410 IF LEN(H)<3 THEN H
420 =0+RIGHT$(H,3)
430 IF LEN(M)<3 THEN M
440 =0+RIGHT$(M,3)
450 IF VAL(H)=24 THEN H
460 =0
470 PRINT@13,H:PRINT@1
480 TRIM$(M,2)
490 RETURN
500 *****
510 * DEMO *
520 *****
530 EXEC 327F8
540 PRINT@19,"demonstra
550 tion"
560 PRINT@17,"*****
570 ***"
580 PRINT@22,"THIS PROG
590 RAM DEMONSTRATES THE
600 INCLUSION OF A CLOCK SUB
610 ROUTINE IN GAMES ETC. THE
620 RE IS NO LONGER ANY LIKEL
630 IHOOD OF MISSING THOSE A
640 PPOINTMENTS."
650 PRINT@457,"press spa
660 ce bar"
670 IF INKEY$="" THEN
680 GOSUB 350:GOTO 560
690 IF I=CHR$(32) THEN
700 ELSE 560
710 *****
720 * CLEAR *
730 *****
740 FOR K=1 TO 26
750 READ A$
760 POKE 32500+K,VAL("MH
770 "+A$)
780 NEXT K
790 DATA 05,60,0E,04,00,
800 07,00,0C,04,20,26,F9,39
810 DATA 05,60,0E,04,00,
820 07,00,0C,06,00,26,F9,39
830 RETURN
```

```
520 ELSE 500
530 EXEC 327F8:PRINT@12
540 " THE TWO PARTS OF TH
550 E PROGRAM HAVE THEIR
560 OWN MACHINE CODE SCR
570 EEN-CLEARING ROUTINES."
580 PRINT@226,"IN ADDITI
590 ON,THE CLOCK HAS A S
600 IMPLE SELF-CORRECTING ER
610 ROR MEASUREMENT."
620 PRINT@322,"AS A RESU
630 LT,A REDUCED NUMBER O
640 F TIMER CHECKS IS REQUIR
650 ED."
660 PRINT@457,"press spa
670 ce bar"
680 IF INKEY$="" THEN
690 GOSUB 350:GOTO 560
700 IF I=CHR$(32) THEN
710 ELSE 560
720 *****
730 * CLEAR *
740 *****
750 FOR K=1 TO 26
760 READ A$
770 POKE 32500+K,VAL("MH
780 "+A$)
790 NEXT K
800 DATA 05,60,0E,04,00,
810 07,00,0C,04,20,26,F9,39
820 DATA 05,60,0E,04,00,
830 07,00,0C,06,00,26,F9,39
840 RETURN
```

Timer
by B Hatton

Microradio

GW6JJN



Portable Stations

Some months ago, Micro-radio discussed the advantages of portable computers in amateur radio, particularly for competitive applications as well as the convenience of a small but efficient machine in the shack. At that time, I reviewed the Tandy Model 100. Following this, ma-

ny Tandy owners wrote to the column asking how best you might use your machines to communicate with other radio enthusiasts.

Down in the depths of Brighton is the office of John Noyce who runs the user group for portable computers; the "Kyocera User Group". Let me explain that the name Kyocera comes from the name of the factory in Japan where these machines are made.

The most recent copy of the newsletter, which John has sent me, includes an extensive article by P.J. Turner, a radio amateur from Suffolk, about the Trs80 Model 100 and its applications for Amateur Radio using AMTOR. The article is well

populated by photographs and diagrams and describes using the AMT-1 Amtor Terminal.

The AMT-1 unit takes in the RS232c output from the Model 100 and converts the signal to AMTOR, (Amateur Teleprinting Over Radio). AMTOR is so efficient a mode that even a low powered portable station can make extensive contacts.

The Kyocera User Group can be contacted by sending a stamped addressed envelop to: John Noyce, PO BOX 450, Brighton, East Sussex, BN1 8GR.

When the column recently described the making of a do-it-yourself interface for the Sinclair Spectrum, there were many readers who wrote in to say that they wanted to hear

more about actually getting down to printed circuit level and making something. I suppose the best thing would be a really powerful computer. Then you could install whatever interfacing for radio that you wanted. At the same time, why not go the whole hog and make the biggest selling, most versatile machine around — the IBM PC; well a compatible at least.

What I am leading up to is the fact that there is a company in the Midlands called Delvex who offer the boards for sale, along with components and all the help needed for the do-it-yourself hacker. Delvex can be reached on 0527 27816.

Ray Berry

POWERFUL UTILITIES

AMSTRAD SPEEDMASTER FAST LOAD UTILITY

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

ONLY £7.95

B.B.C. TAPE TO DISC UTILITY

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

ONLY £9.95

ATARI TAPE TO DISC UTILITY

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

ONLY £9.95

COMMODORE 64

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

DISC DISECTOR

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

ONLY £29.95

QUICKDISC Incorporating Menu Maker

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

ONLY £11.95

FASTBACK Fast Load Utility

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

A **very professional** program.

ONLY £9.95

DISCO THE TAPE TO DISC UTILITY

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

ONLY £9.95

HARDWARE

DOUBLER

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

ONLY £12.95

ROCKET

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

ONLY £7.95

BIGMOUTH

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

ONLY £7.95

COMMODORE CONNEXION

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

Simple to use and very reasonably priced.

ONLY £14.95



3M SCOTCH
DISCS
S.S.D.D. **£16.00**
LIFETIME
GUARANTEE
BOX OF TEN



DATA RECORDER
A **dedicated** data recorder designed for use on the CBM 64 or Vic-20. Specification as C2N but **with pause button**. Model available for the PLUS4 or 16 at same price.
SATISFACTION GUARANTEED.
ONLY £29.95

HUGE RANGE OF SOFTWARE & BOOKS FOR BBC, ELECTRON, SPECTRUM, COMMODORE 64, VIC 20, ORIC, DRAGON, MEMOTECH & ZX 81
Trade and Overseas Orders welcome.
All prices inclusive. Send Cheque, P.O., Bank Draft or phone your Card Number to 0386 49641.



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

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

Sound Editor

on QL

This is a program for the Commodore 1520 printer/plotter.

The program will generate a calendar for any year later than 1752 because on September 14 of that year the present calendar was adopted, which means that the calculi within the program would produce a Gregorian response to a Julian calculation.

The program only uses three character sizes: 20 cpl, 40 cpl and 80 cpl, which it uses for (in order of sequence): printing a heading - "Year calendar", printing the month and the day/date.

Program Notes

Variables

M\$(12) = Month eg March.
M(12) = Number of days in the month M\$ eg 31
D\$(7) = Days of the week eg Mon, Tue etc.
I = Counter
L = Counter eg as above.
V = Day counter - tells the computer what day the next date falls on eg mon 23
Z = Print space counter.
T = Counter for days in the month eg counts up to M(12).
A\$ = String value of T
Y = Year.
A = Numerical variable used in calculating what day the first of January falls on

Lines

500-605 = Input the year and decides what day the year begins on.
3-5 = Open 4 of the printer channels: CHR size, colour, draw and print.

6-8 = Prints a calendar heading
9&31 = Draw a line from one side to the other
10 = Sets up dimensions of arrays.
20 = Inputs name of month (i) and the number of days.
30-110 = Prints the calendar.
50-95 = Decides which column the next date goes in (eg Mon)
200-210 = Data - month & number of days in it.
220 = Data - days of the week.
299 = Prints a line to divide the two columns.
300 = End of program.
310-400 = Adds an extra character to make two characters in the date
480-495 = Print an introductory page.
61 = Starts the program.

Poke 36879,8 colours the screen black - this is the only item in the program which needs to be altered to make it compatible with the Commodore 64 with a 1520.

```

1 GOTO480
2 OPEN1,0,1:OPEN2,0,2
3 OPEN3,0,3:PRINT#3,0:OPEN4,0,0
4 PRINT#2,3
5 PRINT#3,2:PRINT#4,"":CALCULATED:
6 PRINT#3,1:PRINT#4:PRINT#2,1
7 PRINT#4,"":MONTH
8 PRINT#4,"":PRINT#3,0:PRINT#4
9 PRINT#1,"D",479,0
10 DIMM$(12),M(12),D$(7)
20 FORI=1TO12:READM$(I),M(I):NEXTI
30 FORI=1TO12:PRINT#4
31 PRINT#1,"D",479,0:PRINT#3,0
32 PRINT#2,2:PRINT#3,1
33 PRINT#4:PRINT#4
34 M$(I):PRINT#3,0:PRINT#4
45 PRINT#2,3
50 FORL=1TO12:PRINT#4,0$(L):NEXTL:PRINT#4
51 PRINT#2,0
52 IFK=98THENK=0:GOTO000
53 IFU<8THENZ=U:GOTO400
54 FORI=1TO12
55 IFU=7THENU=8:PRINT#4

```

```

80 GOTO310
81 PRINT#4,A$
95 U=U+1:NEXTI
110 NEXTI
200 DATAJANUARY,31,FEBRUARY,28,MARCH,31,APRIL,
30,MAY,31,JUNE,30,JULY,31,AUGUST,3
210 DATASEPTEMBER,30,OCTOBER,31,NOVEMBER,
30,DECEMBER,31
220 DATASUN,MON,TUE,WED,THU,FRI,SAT
299 PRINT#1,"D",479,0:PRINT#1,"D",479,999
PRINT#4:PRINT#1,"M",479,0:PRINT#1,"D",
479,250
300 END
310 IFI<10THENM$=STR$(I)+"":GOTO000
320 A$=STR$(I):GOTO000
400 A$="":PRINT#4,A$
405 IFZ=1THEN000
410 Z=2-1:GOTO400
480 POKE36879,8:PRINT#2,*****
*****
481 PRINT"*****"
490 PRINT"***** THIS ONLY WORKS IN CONJUNCTION

```

```

WITH THE COMMODORE 1520 PRINTER
491 PRINT"PLEASE NOTE THAT THE PROGRAM WILL
NOT WORK FOR ANY YEARS PRIOR TO "
493 PRINT"THE YEAR 1753. AS THEY USED
ANOTHER CALENDAR THEN."
495 PRINT"*****"
500 INPUT"WHICH YEAR?":IFY<1753THENRUN
510 A=INT(IFY/100)
520 A=A*100:A=Y-A
530 A=A+INT(A/4)
540 A=A+2:IFY/4=INT(Y/4)THENA=A+1
550 A=A-INT(A/2)
560 A=A-1
570 IFY<2000THENA=A-1
580 IFY<1900THENA=A-2
590 G=0
600 IF0<8THEN0=0-8:GOTO000
601 IF0<8THEN0=0
602 IF0<8THEN0=0+8
605 U=0
610 GOTO3

```

Sound Editor
by Andrew Fuller

The Music Box



Tone Control

First, a correction: the new MIDI-compatible Casio keyboard mentioned a couple of weeks ago is the CZ-101, not the CT-101 - and very impressive it looks, too. Casio is bringing out a whole new range of keyboards, all of which look inviting. The CZ-101 is the one that's most likely to interest computer users. It will retail at £395 and should be available from January.

Simple keyboard add-ons to computers are becoming increasingly available. There's Commodore's own clip-on device for the 64 (part of the £30

Music Maker package) at the cheap end of the scale. Further up the price range, you can buy Autographic's *Microsound* keyboard or Siel's CMK 49 for the Commodore (both with software and priced between £125 and £150) and LVL's *Echo 1* for the BBC Model B or the 64 at around £100.

As far as the BBC is concerned, its biggest failing is sound quality. This is partly due to the use of 76489 sound generator - a situation which can't be improved - and partly due to the woefully inadequate on-board audio output circuitry. LVL has had the canny idea of marketing an external amplifier for both the BBC and the 64 (the *Echosound*). Those of you who don't want to fork out £50 for one of these purpose-built devices can quite easily wire up their computers to their own hi-fi sets. PL16 and any of the 0 volts pins on the BBC's 1 MHz bus will give you an audio output signal, which can be fed into the tape input on your

amplifier. On the 64, audio output is provided on pins 2 and 3 of the 5-pin audio/video DIN socket on the back of the computer. Both these outputs are useful for recording your music but, in the BBC's case, you can also improve the sound no end by a little judicious use of tone controls or filters.

This point about the BBC has been made - to me anyway - most forcefully by Doug Tate who runs the one-man Musicsoft show at 12 Fallowfield, Amptill, Beds (0525 402701). Doug has produced a suite of music programs for the Beeb which is designed for everything from amusement, through teaching, up to high quality synthesis. The most sophisticated program (The Synth - for OS 1.0 up) retails at £8.75, while the others, offering a range of facilities and amusements, sell for £5.75 each. I can heartily recommend them all. Please send Doug an SAE for further details.

Ranged against him - al-

though not entirely in competition - is the rather larger concern of Island Records, whose software division (Island Logic) have just released their first product (for the BBC), ambitiously titled *The Music System*. TMS is really designed for professional composition (including, as it does, a music print-out facility). It retails at £24.95 on disc or at a total of £25.90 on two cassettes. I can say right now that the packaging, the features on offer and - most of all - the graphics are superb.

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.

No man's land

ORIG/ATMOS

ORIG/ATMOS

OTHER TITLES FOR CBM64/V20 SPECTRUM ZX81 AVAILABLE ON REQUEST



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



0540 STYX (arcade). Destroy the castles of the Dark One which guard the river Styx. Struggle against vultures, the eyes of the devil and his minions to vanquish evil. £ 8.50



0494 DEBUG (utility). A monitor/debugger to debug your programmes in machine code: position of internal registers, set breakpoints, step through programmes. £ 11.95



0496 OPTIMUM (home). Manage up to 4 different accounts, keep track of expenditure and compare with your monthly or yearly budget. Just what you need to keep the household accounts in order. £ 9.95



0495 FIRE FLASH (arcade). Prevent the aliens from sabotaging the fuel depot and avoid enemy fire by passing into hyper space. An attractive and challenging arcade game in 100% machine code. £ 8.80



0526 TYRANN (adventure). Can you find your way through the labyrinth and liberate Queen Tyrann from her torment? A first-class adventure game with text and graphics. £ 8.95



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



0510 MULTIFILER (business). A powerful programme for creating files. Choose your own criteria adapted to your requirements. Rapid sort and search features in machine code and possibility of memorising over 30000 characters. Extremely simple to use. £ 14.95



0463 PANIC (action). Catch the marauding apples by setting traps. 6 levels. £ 6.95



0515 THE HARE AND THE TORTOISE (education). A game for 3-8 year olds to teach the notions of right, left, up, down and counting. The hare and the tortoise decide to race. Who will win? The level of difficulty is adjustable to the child's ability. £ 8.50

OTHER ORIG/ATMOS TITLES

0497 ADDRESS BOOK	£ 9.95
0498 BANK ACCOUNT	£ 12.50
0499 BASIC PLUS	£ 9.95
0502 COMPUTER ASSISTED DESIGN	£ 8.50
0504 CHARACTER GENERATOR	£ 8.50
0465 CONCOURS HIPPIQUE	£ 5.95
0464 CW MORSE	£ 14.95
0506 FINANCIAL CALCULATOR	£ 9.95
0507 INVOICING	£ 14.95
0508 LEARNING FORTH	£ 16.95
0509 LIBRARY CATALOG	£ 9.95
0511 SCREEN KIT	£ 9.95
0513 SUPERCOPY	£ 9.95

RETAILERS CONTACT:

CentreSoft

OR ASK YOUR DISTRIBUTOR TO CONTACT US

DISTRIBUTORS AND OVERSEAS ENQUIRIES CONTACT:

JANET PELTON, INNELEC-NO MAN'S LAND 110 BIS RUE DU GAL LECLERC 93506 PANTIN CEDEX FRANCE TEL.: 33-1-840.24.31.

MAIL ORDER:

POST COUPON TO HIGH TECH UNITS 1 & 2 CONLON DEVELOPMENTS WATER LANE DARWEN LANCASHIRE

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

REF	TITLE	QTY	TOTAL PRICE

PO/CHEQUE ENCLOSED OR DEBIT ACCESS/VISA IF CARD EXPIRY DATE:

IMPORTANT: All cheques or cards payable to NO MAN'S LAND and sent to High Tech

NAME

ADDRESS

POSTCODE

OFFICIALLY
LICENSED
FROM
M.C.A.

AIRWOLF



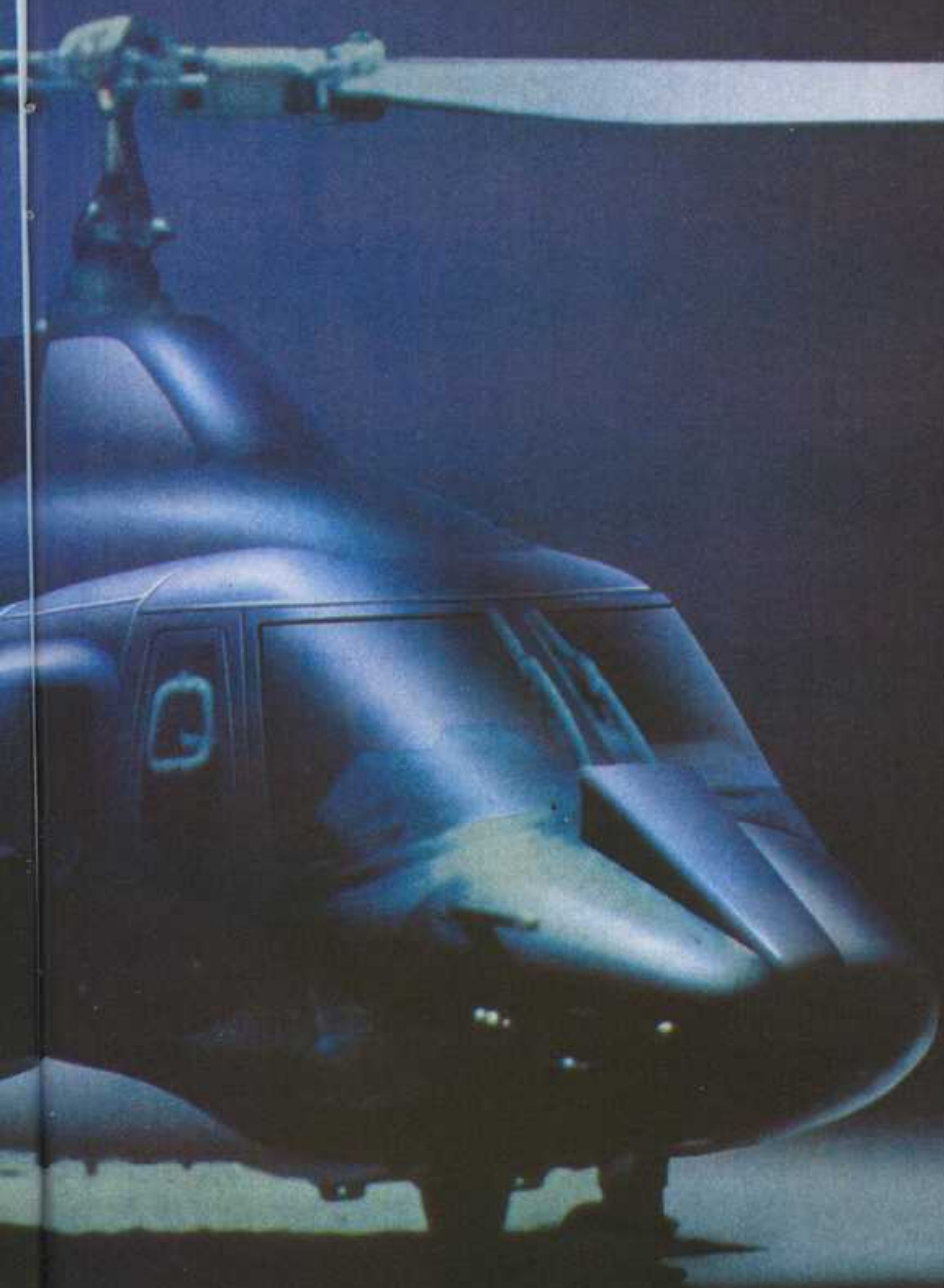
Stringfellow Hawke, a former Vietnam chopper pilot is the only man in the free world trained to fly the billion-dollar helicopter AIRWOLF! You are Stringfellow Hawke...

48K
SPECTRUM
£6.95
COMMODORE 64
£7.95

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

Elite Systems Ltd., 55 Bradford Street, Walsall WS1 3QD.
Telephone: (0922) 611215, Telex 335622 SPETEL G, Attn: Elite.

VOLFF



elite

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

Open Forum

Calendar

on Vic-20

This is a program for the Sinclair QL computer. It allows the user to experiment with the *Beep* command which is not very well documented in the user guide. To use

the program the user must press one of the number keys which matches the selected option. Once this is done they must enter the new value, followed by enter.

```

100 MODE 4 : k=0
110 CLS 0
120 PAPER 3
130 :
140 time=10000
150 pitch1=0
160 pitch2=0
170 xgrad =0
180 ygrad =0
190 wrap =0
200 fuzzy =0
210 rand =0
220 CLS
230 INK 7:AT 2,0:PRINT "Sound Editor"
240 PRINT "-----"
250 PRINT
260 AT 5,0:ffill:AT 5,0
270 INK 7
280 PRINT "BEEP ";time;","pitch1;","pitch2;","
    ";xgrad;","ygrad;","wrap;","
    fuzzy;","rand
290 PRINT:PRINT
300 PRINT "1-Time      ";time
310 PRINT "2-Pitch1     ";pitch1
320 PRINT "3-Pitch2     ";pitch2
330 PRINT "4-Xgrad      ";xgrad
340 PRINT "5-Ygrad      ";ygrad
350 PRINT "6-Wrap       ";wrap
360 PRINT "7-Fuzzy      ";fuzzy

```

```

370 PRINT "8-Random  ";rand
380 PRINT "9-Play"
390 a$=INKEYS(-1)
400 IF a$="1" THEN AT 8,0:ffill:AT 8,0:INPUT"
    Time      ";time:k=1
410 IF a$="2" THEN AT 9,0:ffill:AT 9,0:INPUT"
    Pitch1    ";pitch1:k=1
420 IF a$="3" THEN AT 10,0:ffill:AT 10,0:INPUT"
    Pitch2    ";pitch2:k=1
430 IF a$="4" THEN AT 11,0:ffill:AT 11,0:INPUT"
    Xgrad     ";xgrad:k=1
440 IF a$="5" THEN AT 12,0:ffill:AT 12,0:INPUT"
    Ygrad     ";ygrad:k=1
450 IF a$="6" THEN AT 13,0:ffill:AT 13,0
    :INPUT" Wrap      ";wrap:k=1
460 IF a$="7" THEN AT 14,0:ffill:AT 14,0
    :INPUT" Fuzzy     ";fuzzy:k=1
470 IF a$="8" THEN AT 15,0:ffill:AT 15,0
    :INPUT" Random    ";rand:k=1
480 IF a$="9" THEN k=1
490 IF k=1 THEN k=0:BEEP time,pitch1,pitch2
    ,xgrad,ygrad,wrap,fuzzy,rand
500 GO TO 230
510 DEFine PROCedure ifill
520 INK 0
530 PRINT FILLS(" ",39);
540 END DEFine

```

Calendar
by R Sage

Book Ends

SPECTRUM SUPergames

Richard G. Hardy



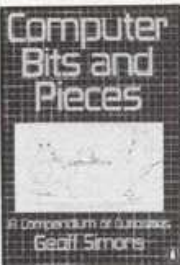
Books Spectrum Supergames; The Atmos Book of Games; The QL Book of Games
Prices £5.95; £5.95; £6.95 (QL)
Micros Spectrum, Oric Atmos, Sinclair QL Supplier Micro Press, Castle House, 27 London Road, Tunbridge Wells, Kent

Despite their attractive glossy covers, we have here three books of Basic listings for the Spectrum, QL and Oric Atmos, each costing approximately the price of a good machine-code game.

The types of game offered are fairly standard — a card game, an educational game, an adventure, etc. However, all three publications bow to the idea that typing in listings teaches programming by including notes on technique. This at least could raise them above some of their opposition.

There may be some argument for games listings for the QL, which lacks software and has a fast Basic, but the Spectrum is so well supplied that books like this enter a market which is already glutted.

John Minson



Book Computer Bits and Pieces
Price £3.95 Micro Any Supplier
Penguin Books, Harmondsworth, Middlesex.

In the period before Christmas many 'nothing' books get published such as 'How to be a Wally' or '1001 Computer Facts'. This book belongs to the latter category, though commit them all to memory and you could well belong to the former!

The problem with it is that it contains nothing but 'data' with

no indication of how to use it. The result is an information overload as indigestible as too much Christmas pudding.

Many of the facts are superficially fascinating, in particular those on microchips and warfare, however the lack of supporting context devalues them. There is no indication of the controversy surrounding certain facts, such as the discovery of the 'ultimate' prime number, either.

A trivial exercise, though parts could still set you thinking.

John Minson



Book Writing Software for Profit
Price £4.95 Micro Any Supplier
Virgin Books, 61-63 Portobello Road, London W11 3DD.

It's probably the dream of every programmer to sell his or her work and retire to a tropical tax-haven.

AJ Harding's book won't help you develop your computing skills, but it does indicate some of the pitfalls along the road to fame and fortune.

It takes the potential millionaire from choice of computer, through types of software, business, utility or games, to copyright, contracts and tax.

Mr Harding runs the Molimex publishing company and knows the industry well, but his book suffers from being too much of an informal chat with too few specifics; an index would have been valuable as well.

But if you can provide the talent, this book could help to point you in the right direction.

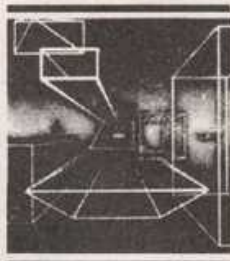
John Minson

TUBE WAY ARMY



Design Design

ROMMEL'S REVENGE



Design Design

JOIN THE AIR FORCE OR THE TANK CORPS

Tube Way Army – star game in the October issue of **Software Today** – 'The super graphics are equal, if not better than the arcade version.'

Dragon User – Tube Way Army is to be recommended £7.95.

Design Design

Rommel's Revenge – When you are dizzy from flying through Tube Way Army, come down to earth and drive yourself dizzy in one of our tanks. Stunning 3D graphics with full perspective and a host of features. £7.95.

Both games are suitable for Dragon 32/64 & Tandy Colour 32K and are available from selected software retailers, Tandy Dealers or mail order from:–

2 Ashton Way, East Herrington, Sunderland SR3 3RX
Trade enquiries welcome: Tel: 061-205 6603

3 NEW CBM 64 GAMES
from
bubble bus

TQZZ
fast action shooting

CAVE FIGHTER
jump, climb and shoot

STRIKE FORCE
3D war game

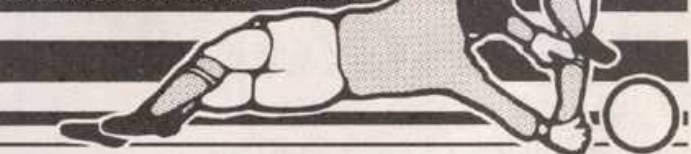
Available from all good retail outlets or direct from
Bubble Bus Software, 67 High Street, Tonbridge, Kent TN9 1RX
Telephone: 0732 355962 Telex: 95151

★ NOW AVAILABLE FOR THE AMSTRAD CPC 464!!

WIN THE POOLS?

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

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



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

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

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

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

GOODE BYTE

SPECTRUM

GAME	RRP	OUR PRICE
CYCLONE	5.95	4.75
DALEY THOMPSON	6.90	4.99
BEACHHEAD	7.95	5.95
WHITE LIGHTNING	14.95	10.50
SHERLOCK HOLMES	14.95	10.50
SABRE WOLF	9.95	6.95
KNIGHTS LORE	9.95	6.95
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
SCRAMBLE	15.95	4.75
EDDIE KIDD JUMP	7.95	4.95
COMBAT LYNX	7.95	5.25
KOKOTONI WILF	5.95	4.75
DUES 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	7.50	4.95
QUASIMODOS REV.	6.90	4.90

TIRNA NOG	9.95	6.95
AIR WOLF	6.90	5.25
MATCH DAY	6.90	4.90
PYJAMARAMA	6.95	5.25
BATTLE CARS	7.95	5.95
D DAY	7.95	5.95
TOWER OF DESPAIR	7.95	5.95
LODE RUNNER	9.95	7.25
GREAT SPACE RACE	14.95	11.25
POTTY PIGEON	6.95	5.25
PITFALL II	7.95	5.95
VALKYRIE 17	9.95	7.50
RAM TURBO INTERFACE		18.00

COMMODORE 64

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

QUASIMODOS REVENGE	7.90	5.90
T.L.L.	7.90	5.90
KOKOTONI WILF	6.95	5.25
ZAXXON	9.95	7.50
SUMMER GAMES	14.95	10.50
QUO VADIS	9.95	7.50
SHERLOCK	14.95	10.50
PSI WARRIOR	9.95	7.50
STORM WARRIOR	8.95	4.90
RAID OVER MOSCOW	9.95	7.50
STAFF OF EARWATH	9.95	7.25
F-15 STRIKE EAGLE	14.95	11.00
BLUE MAX	9.95	7.50
TAPPER	9.95	7.50
SELECT 1	12.49	8.50
SPY VS SPY	9.95	7.50
BOULDER DASH	8.95	7.25
HOBBITT	14.95	9.99
DALEY THOMPSONS DECATH.	7.90	5.50
KONG'S REVENGE	7.90	5.90
ROLANDS RAT RACE	7.90	5.90
MATCH POINT	7.95	6.50
FIGHTER PILOT	9.95	7.50
TORNADO LOW LEVEL	7.90	5.90

ALL PRICES INCLUDE P&P

QUICKSHOT II ONLY £8.99
PLEASE NOTE IF OUR ORDER
EXCEEDS £50 YOU GET
10% FURTHER DISCOUNT
SEND CHEQUES /P.O. TO
GOODBYE PCW10
94 LEATHER LANE, LONDON EC1
PLEASE STATE WHICH MICRO

3D COMPUTERS

THE HOME COMPUTER SPECIALISTS

XMAS BARGAINS

BBC SINGLE DISK DRIVE
200K DOUBLE SIDED CASSED,
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



LONDON COMPUTER CENTRE

SPECIAL PRICES FOR XMAS!

NEC 8201 Portable Computer 16K
expandable to 96K
New low low price **£289.00**



Sanyo Specials

IBM
COMPATIBLE
16 bit

Free Software (Worth £600) and
Free Hi-Res Mono Monitor (worth £125)
with Sanyo 550 128K RAM
2 X 800K drives £1,085.00

Free Software (worth £1,000+) and
Free Hi-Res Mono Monitor (worth £125)
with Sanyo 555 128K RAM
2 X 800K drives £1,295.00

All prices excluding VAT

43 Grafton Way, London W1P 5LA (Opposite Maples)
Opening Hours: 10-7 Mon-Fri, 10.30-4 Sat.
01-387 4455 (4 lines) Telephone Answering Service After Office Hours
Telex: 8993742

DEMONSTRATIONS
SALES - SERVICE
SUPPORT

MACBETH

THE COMPUTER ADVENTURE

A package of four completely different adventures plus four character analysis programs.

Step into the leading role in one of the most complex and intriguing webs of murder, treachery and witchcraft ever conceived.

Uses graphics as an integral part of the problem solving.

Written by a highly qualified team of experts.

Even the most experienced adventurers will find something new and challenging.

Let your computer stretch your imagination.

FOR COMMODORE 64
£14.95

WRITTEN AND DESIGNED BY OXFORD DIGITAL ENTERPRISES

CREATIVE SPARKS

Available from

All good computer software stockists.

Send me (tick as required)

- ☐ My local stockist's address
☐ Your full list of games
☐ _____ copy/ies of this game

TNEE 293 at £14.95 each £ : p
 + single P&P sum : 30p
 Total to send £ : p

Method of payment

By cheque or PO (no cash) made payable to **TECS**



- ☐ By Access or
☐ Barclaycard

Enter card no.

Sign below:

Credit card sales: UK buyers only.
 Response within 21 days.

Creative Sparks,
 Department M0,
 296 Farnborough Road,
 Farnborough, Hampshire, GU14 7NF
 Telephone: (0252) 518364.

Name

Address

PCW 1184

Tony Bridge's Adventure Corner



Sweet dreaming

While *The Quill* prompted a huge number of adventures to be written for the Spectrum, its release for the Commodore has not, as yet, elicited such a response. This may change now that Codewriter Ltd have taken the package under licence. This company is an American outfit, originally called Dynatech and renamed in honour of its main product, a database called *Codewriter*. Having signed a license agreement with Gilsoft, they are now marketing *The Quill* under the name of *Adventure Writer*. It is available now on disc for the Atari, Apple II and Commodore 64 for £24.95. The program, apparently, is exactly the same as the original *Quill*, but the manual has been made much more friendly. This is obviously great news for Apple and Atari owners — now they can add their adventures to the flood of Spectrum (and some Commodore) programs. If you fancy yourself as an adventure writer, don't hesitate — you'll find this one of the most useful utilities you own.

It's not, maybe, such good news for Commodore owners, who can obtain the same program (though an outdated manual) from Gilsoft at a mere £15 (cassette) or £20 (disc). It's a pity that Codewriter's advert doesn't mention *The Quill* anywhere, but I'm sure they do in the documentation.

Meanwhile, Gilsoft themselves have just released *The Illustrator*, the follow-up to *The Quill*. Although they have secured an honoured niche for themselves in the Adventure Hall of Fame with the earlier program, Gilsoft have now gone, I'm told, one better in this new utility. Using it in conjunction with *The Quill*, the intrepid adventure writer can now add graphics to his Quilled adventure. Again, more news as soon as possible.

As far as Quilled adventures on the Commodore go, I have only been sent one! This is from Keith Wadhams, who has written *Problems of Dreaming*. He says that, although he hopes to be able to interest someone in marketing this program for him, he is prepared to supply a copy for £3, including postage and packing, to anyone who cares to write him at 122, Melrose Avenue, Wimbledon Park, London SW19.

I passed the tape along to my good friend and fellow adventurer, The Great Wizard, aka Ken Matthews, who had this to say: "As you can tell from the title, this is about a dream world — the dream world of a young boy (played by you) who, bored with a rainy day and fed up with watching TV and reading papers, finally falls asleep. In his dreams, characters and situations from the newspaper and TV come to life. Eventually he finds himself in a nightmare."

"Keith has obviously taken a great deal of time to develop his ideas and put a lot of thought in to the program. I thought that it might be easy when I found the Bent Pin, needed to pick the shed lock, in the very next location. This is far from the case! Location descriptions are detailed and contain clues to portable items, so close attention is needed at all times. To date, all of the problems have a logical solution and the command analyser has understood a variety of synonyms."

"Overall, then, I'd say that the game is better than many I've seen, and certainly deserves better than being sold for £3"

Level 9 has been busy over the past few months. The new programs are not only up to the usual standard as far as the text is concerned, but now, as I'm sure you'll be aware, also include graphics for the first time. These are executed with Level 9's usual eye for detail, and are small, but, like

the Grand Elf, perfectly formed. *Return to Eden* is the sequel to *Snowball* and takes place on the planet Eden, while *Eric the Viking* is based on the book by Terry Jones of *Monty Python*. The substantial package includes several extracts from the book to give a flavour of the original. On-screen, both programs look very similar, with a new character set which I found quite difficult to read — but the problems to be found in the adventures are in the best Level 9 tradition, and I'm sure that the Corner will have many letters about these adventures. I'm looking forward to delving further into these games.

Talking of letters, here's one from a miffed Hareraiser fan: "Dear Tony, After reading about Hareraiser in PCW, I wonder who these nerds are who think this isn't any good. I am one of a group of six who have had immense fun from seeking clues on this treasure hunt, and furthermore, it's not meant to be like the book *Masquerade*. If one seeks to win the Golden Hare, the computer gives the clues, the rest is down to you — that is, if you're intelligent enough. Yours, Mrs J Y Widdowson."

These 'nerds', Mrs Widdowson, are those people who have been persuaded that this program is actually an "adventure puzzle". At the top of the ad for the game, in great big letters it says "Win! the famous jewelled Hare of *Masquerade*" and, though, I'm sure that you've had a lot of fun, Mrs Widdowson, I don't blame anybody else for being disappointed after thinking that this 'puzzle' might be at least a little closer than a million miles to *Masquerade*. But this is the final correspondence on the subject — I've had enough already!

And now a final letter, from Scott Kelly of Glasgow. He is stuck in *Old Father Time*, for the BBC. This is from Bug-Byte, and I haven't seen, nor know anything about it. Scott is having trouble right at the start and is a bit embarrassed at the whole thing, having had success with other adventures. Confronted with a forest floor covered with leaves, I admit that my first reaction, too would be to move the leaves — how about search or examine the leaves? But I'm sure you've tried this one, contact Scott at 12 Pollock Rd, Bearsden, Glasgow G61 2NJ.

Scott offers reciprocal help with *The Hobbit*, *Adventureland*, *Sphinx Adventure*, *Philosopher's Quest*, *The Count*, *Castle of Riddles* and *Colossal Adventure*. As usual, don't forget to enclose a SAE if you want a reply from him.

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,

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

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

Adventure on (micro)
Problem
Name
Address

STARFINDER



STARFINDER

Starfinder gives you all you need to begin astronomy.

- * Computer program displays star maps for any time, date and place on Earth.
- * Unique 'space probe' enables you to identify stars, planets, Halley's Comet, etc.
- * Print-out facility for star maps.
- * Accompanying book by Heather Couper

explains everything from black holes to constellations.

£12.95 ISBN 0 7126 0571 1 BBC Micro/Electron

ORDER FORM

To: Gill Small, TBS, Church Road, Tiptree, Colchester, Essex CO5 0SR

Please send me STARFINDER
software pack(s)
at £12.95 (inc VAT and post & packing)

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

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

Account Number

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Name

Address

Signed

(Please allow up to 28 days for delivery Subject to availability.)

POP CW

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

U.K. HOME COMPUTERS JUST RELEASED

3D STAR STRIKE

(48K SPECTRUM)

CRASH — SMASH 93%

ONLY £4.60 (inc. P&P)

BLANK CASSETTES

10 C10's for £3.65. 100 for £25.00
10 C15's for £3.85. 100 for £26.00
10 C20's for £4.00. 100 for £27.00

Fully guaranteed inc. P&P. C.O.D. add 65p. Immediate despatch

UK HOME COMPUTERS

82 Churchward Ave., Swindon, Wilts.
24 hr. order Phone 0793-695034

* Special offer C30 blank cassettes: £25.00 per 100 inc. P&P

SOFT INSIGHT DISCOUNT SOFTWARE

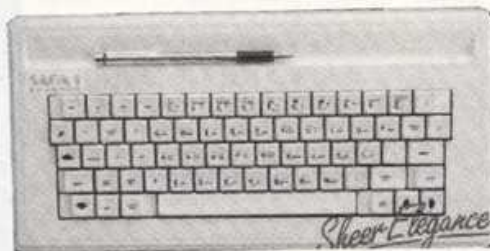
SPECTRUM	R.R.P.	OUR PRICE	SPECTRUM	R.R.P.	OUR PRICE	SPECTRUM	R.R.P.	OUR PRICE
SHERLOCK HOLMES	14.95	11.00	CYCLONE	6.95	5.40	GAMES CREATOR	17.95	10.00
SPACE SHUTTLE	7.95	6.40	PIRAT 2	7.99	6.20	ALL STATE SOFT	8.95	7.30
ZOMBIE ZOMBIE	8.95	5.40	THE FALLOUT	8.95	5.50	J.S.W.	7.95	6.20
LOAD RUNNER	6.95	5.40	FIRE ON THE WATER	8.95	7.40	QUADRADIS	9.95	7.50
ASTRONAUT	8.95	5.40	FLIGHT FROM THE	8.95	7.40	FIRE QUEST	9.95	7.50
FALL GUY	8.95	5.40	DARK	8.95	7.40	ALL INTERCEPTION	7.00	5.40
STAR STRIKE	8.95	5.40	DRIVE IN	5.50	4.40	POTTY PIGEON	7.95	6.40
THE WOLF	8.95	5.40	XAVIOR	5.95	4.80	MONTY MOLE	7.95	6.40
SKY RANGER	8.95	5.40	AMSTRAD			BATTLE FOR MIDWAY	9.95	7.40
SON OF BLASSER	8.95	5.40	HUNCHBACK	7.95	6.50	PSI WARRIOR	9.95	8.90
PYJAMAAMA	8.95	5.40	BLASSER	7.95	6.50	SHERLOCK HOLMES	14.95	11.00
DARLEY'S DECATHLON	8.95	5.40	ALL AMSTOFT GAMES	8.95	7.50	FORT APOCALYPSE	9.95	7.40
DARK STAR	7.95	5.90	STEVE DAVIS SNOOKER	7.95	6.40	BRUCE LEE	14.95	12.00
RIVER RABBIT	7.95	6.20	MANIC MIND	8.95	7.50	SEAN AND THE E.S.	7.95	6.80
RETURN TO EDEN	9.95	7.50	ALL LEVEL 9	9.95	7.60	SUICIDE EXPRESS	7.95	6.20
ALL LEVEL 9	9.95	7.50	INC.			EUREKA	14.95	11.00
JASPER	8.95	5.40	JET PAC	7.95	6.20	PYJAMAAMA	7.95	6.20
LORDS OF MIDNIGHT	9.95	6.90	ELITE	14.95	11.50	SELECT 1	17.49	9.50
COMBAT LYNX	8.95	7.40	3-D GRAND PROX	9.95	7.50	BRUCE LEE	9.95	7.40
BATTLE CARS	7.95	6.20	FRANK	8.95	6.75	DREDS	9.95	7.40
D-DAY	7.95	6.20	FORTRESS	8.95	6.75	FORT APOCALYPSE	9.95	7.40
TRENAUCO	9.95	7.50	MANIC MIND	7.95	6.20	CONSTRUCTORS	10.95	8.50
BACKPACKERS	7.50	5.90	SACRE WOLF	9.95	7.60	FIGHTER PILOT 64	9.95	7.40
WHITE LIGHTNING	14.95	10.40	ALL OF U.S. GOLD	9.95	7.40	RAD OVER MOSCOW	9.95	7.40
DANGER MOUSE	6.95	4.90	STAFF OF KARINATH	9.95	7.60	T.L.	7.95	6.70
SELECT 1	14.49	9.40	THE PENCIL	14.95	11.50	ELECTRON	12.95	10.95
POTTY PIGEON	6.95	5.40	ALL ACTIVISION	9.95	7.60	ELITE		
STEVE DAVIS SNOOKER	7.95	5.90	ALL LEVEL 9	9.95	7.60	ALL PRICES INCLUDE 48 HOUR RECORD DELIVERY***		
EUREKA	14.95	11.00	STREP POWER	9.95	7.40			
UNDERWORLD	9.95	7.60	GALAXY DANCE	7.95	6.20			
KNIGHTS LEONE	9.95	7.60	PSYTRON	7.95	6.20			
GHOSBUSTERS	9.95	7.60	KOZMIC KANGA	5.95	4.50			
TOWER OF DESPAIR	7.95	6.20	SUMMER H GAMES	14.95	11.15			
VALKIE 17	9.95	7.20	3D ANT ATTACK	7.95	6.40			

Please make cheques payable to Soft Insight and send to SOFT INSIGHT, PO BOX 808, LONDON SE3 7ER. Access orders/enquiries 01-305 0790

IF YOU WANT THE BEST THIS CHRISTMAS

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

£177.50



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

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

PLEASE SEND ME

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

I enclose cheque/P.O. for

ZEAL MARKETING LIMITED

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

LET OUT THOSE SOUNDS WITH A ZEAL SOUND BOOSTER FOR SPECTRUM

£14.50



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

ALL PRICES INCLUDE VAT/CARRIAGE.



Quick and reliable

Alexander Lepre of Marsa, Malta, writes:

Q I am considering the purchase of Digital Research's *Sprint* for the Spectrum, and so I would like to know whether it is really all that it states in the advert.

A I don't know what adverts you have seen, but if they have appeared in British computer magazines, then you can be assured that the machine will do what is claimed. The British Advertising Standards Authority are quick to act against misleading or incorrect adverts.

Also, my experience is that the *Sprint* (which is made by Challenge Research by the way), is very quick, and very reliable.

Thesaurus index

C S Ryan of London, writes:

Q Being an avid crossword fan, I would like to know whether there is a program that I could use to form something like a thesaurus? For example if I type in *Blot*, I would get a list of words such as *Blemish*, *Soil*, *Obliterate*, *Stigma*.

My computer is a 48K Spectrum with a cassette recorder only, my knowledge of machine code is nil, and my Basic very limited. I am thinking of a dictionary in excess of 5,000 words. Is this type of program impossible on a Spectrum?

A Well let's take a look at the facts. Assuming an average word length of 7 characters, gives us 35,000 characters

of Ram needed to store our dictionary. Obviously this is far too much, so you would have to use some form of character compression techniques.

Assuming that on average each word would have 5 alternative words, gives us 25,000 numbers that have to be stored. Again, this is too high a figure.

We are only able to use cassette tape for storage. This means that we cannot realistically manipulate the thesaurus via the cassette. There are no software packages suitable for such a purpose which work with cassette tape (or indeed as far as I know with disc).

I think that the conclusion I reach is that with your self confessed limitations in programming know-how that this project is a non-starter. However, if you were able to find a machine code programmer to collaborate with, you might have some chance of success.

Pascal compiler

John Alexander of Bognor Regis, writes:

Q I have two queries regarding the Vic 20 computer. Do you know of any Pascal Compiler, or interpreter for this machine? A cartridge would of course be preferable. Also, can you suggest a supplier of suitable plugs to connect to the User and Games Ports to allow the connection of special peripheral units?

A If only you had a Commodore 64, John. Since the launch of the 64, the poor Vic has been almost completely neglected as far as software is concerned. It seems to me that with the number of Vic 20's that are still in use that there is a large market that is simply being neglected by the software companies. You may have gathered from this that the answer to your first question is NO. More luck, however, with your second question.

Kentech are suppliers of a large number of interfaces, etc, for the Vic (and other machines). They may be able to satisfy your requirements. Their address is: Kentech, St. Oswalds Trading Estate, Gloucester GL1 2SU.

A lost voice

Kevin Edwards of Stoke-on-Trent, writes:

Q I own a Commodore 64 with Simons Basic. As many readers may agree, the Simons Basic manual is far from being sophisticated, and only outlines the simple commands and uses.

Recently I have been trying to compose a tune. However, I could not seem to get any voice bar voice one from working, however carefully I followed the instructions.

Could you possibly advise me where I might be going wrong?

A Well, no actually. As you haven't told me what you have done, I cannot tell what, if anything, you've done wrong. I agree, however, with your point about the manual, though.

The Commodore Programmers Reference Guide on the other hand, has an excellent section concerning the SID sound chip, and the way to get the most from it.

This book is available from most good bookshops, and is definitely worth a look.

Two gold stars

D C A Turkhud of Hornsea, North Humberside, writes:

Q In answer to a query in PCW in September you stated a number of difficulties in loading *Vu-File* on to microdrive.

Using the software *Trans-Express* published by Romantic Robot of 113 Melrose Avenue, London NW2 4LX, I have successfully transferred both *Vu-Calc* and *Vu-File*.

A I have had a number of letters on this subject, mostly pointing out that the method of transferring software to microdrive depends on the program.

One software company

wrote to me and explained that they had introduced a scheme whereby owners of cassette versions of some of their products could obtain microdrive versions on an exchange (plus £1.50) basis. This company (Picturesque), also pointed out that their attitude had been motivated more by a desire to obtain 'customer good will', than by a desire to generate revenue.

This kind of behaviour in a software company is to be applauded, and I therefore award Picturesque Software two gold stars, and top place in the 'Peek and Poke Hall of Fame'. Not an award that is given lightly.

Picturesque can be contacted at 6 Corkscrew Hill, West Wickham, Kent BR4 9BB.

Statement output

Bryan Scott of Hayes, Middlesex, writes:

Q As I have had some trouble recently with Spectrum programs (*Zeus Assembler*, *Vu-Calc*). I tried the *Print In 16602* statement shown in PCW, Vol 3 No 38 and got the answer 63. As I have an issue 3 computer what does this mean please?

A Since the appearance of this now legendary method of identifying a Spectrum, I have received numerous letters quoting various numbers that were produced in response to it. 63 is in fact the leader, with 126 and 199 close behind. I am at somewhat of a loss to explain this, as my machine continues to output the depressingly consistent value of 191.

As a check, I used my backup method of determining the issue number, which is *Print In 57342*. This produces 191 on an issue 3, and 255 on issues 1 and 2 (normally).

I would be interested in hearing from readers who experience any differences with this statement's output as well.

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

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, BBC B £380, Electron £190, Goldstar MSX £220, Sanyo MBC-550 £725, MBC-555 £940, CBM 64 £185, CBM 1541 Disk £210, CBM Data Recorder £40.00, Sinclair Expansion Pack £95, Microdrive/Interface £47, QL Monitor £260.

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

Cheque/P.O. to:

AHMEDI INTERNATIONAL

Unit 1, 9 Winchester Street,
London W3 8PA

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

THE MEGASAVE FANTASTIC SAVINGS

SPECTRUM		MONTY MOLE		PYJAMARA	
KNIGHT LORE.....	8.50	DECATHLON (DALEYS) 5.85		BOULDER DASH.....	6.85
CYCLONE.....	5.85	BEACH HEAD.....	6.85	SUICIDE EXPRESS.....	6.85
XAVIOR.....	4.95	AMERICAN FOOTBALL 8.50		PSI WARRIOR.....	6.85
VALKYRIE 17.....	8.75	COMBAT LYNX.....	6.85	RAID OVER MOSCOW.....	8.50
GREAT SPACE RACE 12.95		FRANKLIN STEIN.....	4.95	PSYTRON.....	6.85
BATTLE CARS.....	6.85	EUREKA.....	12.95	AMERICAN FOOTBALL 8.50	
PLUMMET.....	4.50	JASPER.....	5.85	CURRAH SPEECH.....	27.50
KNIGHT LORE.....	8.50	KUNG FU.....	5.85	DANGER MOUSE.....	6.95
UNDERWORLD.....	8.50	TIR NA NOG.....	8.50	SPY VS SPY.....	8.50
BACKPACKERS.....	6.75	ASTRONUT.....	4.95	TAPPER.....	8.50
TRAVEL TRASHMAN.....	4.95	MUTANT MONTY.....	5.95	EUREKA.....	12.95
DANGER MOUSE.....	5.95	SKY RANGER.....	4.95	BRUCE LEE.....	8.50
PYJAMARAMA.....	5.95	ALIEN 8.....	8.50	BLUEMAX.....	8.50
DOOMDARKS REVENGE 8.50		BOLDER DASH.....	6.85	MATCHPOINT.....	6.85
ZOMBIE ZOMBIE.....	5.85	JEWELS OF BABYLON 4.50		TORNADO LOW LEVEL.....	6.85
STEVE DAVIS SNOOKER 6.85		DESIGNER PENCIL.....	8.50	CAD CAM WARRIOR.....	8.50
DEUSEX MACHINA.....	12.95	SON OF FLAGGER.....	4.95	ALIEN.....	8.50
POTTY PIDGEON.....	5.95	HOUSE JACK BUILT.....	6.85	HYPERBIKE.....	6.95
SKIDOL DAZE.....	4.95	MACHINE LIGHTNING 17.50		HOUSE JACK BUILT.....	7.85
SIR LANCELOT.....	4.95	COMMODORE		POST & PACKAGING FREE	
TURMOIL.....	5.85	STAFF OF KARNATH.....	8.50	STATE WHICH MICRO FAST	
DARK STAR.....	6.50	BATTLE THROUGH TIME 6.85		SERVICE.....	
DRIVE IN.....	4.50	QUANGO.....	5.85	SEND CHEQUE/P.O. TO:	
FALL GUY.....	5.95	GUZZLER.....	5.85	MEGASAVE Dept 1, 76	
SUPER MUTT.....	5.95	GHOSTBUSTERS.....	9.50	Westbourne Terrace,	
LORDS OF MIDNIGHT 8.50		FIGHTER PILOT.....	8.50	London W2	

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

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

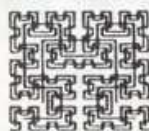
An excellent assembler, an advanced line-editor, a comprehensive disassembler and a superb 'front panel' debugger all in one package. Used by many leading software houses to write their games. "Buy it!" Adam Denning 1984.

PASCAL

£25

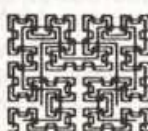
A powerful and almost full implementation of Pascal - not a Tiny Pascal. A valuable educational and development tool, programs typically run 40 times faster than a BASIC equivalent. Spectrum version includes Turtle Graphics package. "I haven't seen any other compiler that could match Hisoft's Pascal"

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.

CLASSIFIED

Semi-display — £6 per single cc
Lineage — 25p perword

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

GAMES SOFTWARE

NEW VIC 20/CBM 64 ARCADE GAMES

SUB WARS — THE HAWK £2.50 each
STARGATE PO Box 1520
Dublin: 603402
RETURN BY POST
DELIVERY GUARANTEED

HAPPY Hippy game, for 48k Spectrum, better than page 3, more fun than Hector Nicol. Send £3 + SAE to B Goldie 211 Mull Petersburn, Airdrie, Scotland ML68 0P.

QL punters easy to use horse prediction program, enter data from daily paper only £9.95 to Anthony Potts, 118 Newman Rd, Exeter.

SUPERPOWER

An entirely new strategic War Game for the SPECTRUM 48K. Just £5.50 inc. From:

HOWARD MARKETING (AD. 1)
PO Box 21, FELIXSTOWE, SUFFOLK IP11 7LJ

COMPUTERS & SOFTWARE

Sinclair QL	390.00	Microdrive	47.00
Spectrum Plus + 6 pack software	174.00	Kempston Joystick Interface	12.00
Spectrum 48K + 6 pack software	124.00	Amstrad CP464 Colour	340.00
Expansion System	99.00	Amstrad GT464 Green	232.00
Interface 1	47.00	DMP-1 Printer Amstrad	190.00
		DDI-1 Disk	191.00

We have a large range of software for:
Spectrum 48K 220 titles 300 titles
BBC B 240 titles 60 titles
Electron 95 titles 200 titles

All categories catered for: Arcade, Adventure, Strategy, Utilities, Home-Business and Educational.

SPECTRUM	COMMODORE 64	BBC B	ATARI
EUREKA 13.00	FORT APOCALYPSE 8.50	FRAK 7.75	BRUCE LEE 12.95
GHOSTBUSTERS 8.50	JET SET WILLY 6.10	ELITE 13.00	FLAK 13.00
TIRANOG 8.50	GHOSTBUSTERS 8.50	MANIC MINER 6.20	ZAXXON 12.95
UNDERWORLD 8.50	EUREKA 13.00	M.F.E.E 5.90	SNOKE 9.00
ELECTRON	AMSTRAD		
HUNCHBACK 6.00	MANIC MINER 7.50		
ELITE 11.25	HUNCHBACK 7.50		
BLAGGER 6.50	COGNOMAT 7.50		
CHUCKIE EGG 6.50	ROLAND IN TIME 7.50		

Write or phone for free catalogue (state micro). P & P free on all items. Cheques to:

MICRO COMPUTER WORLD
1 Lane Close, London NW2 6QZ. 01-452 0893
Please phone for availability of hundreds of other titles.
ACCESS TAKEN

STOCKING FILLERS AND CUT PRICE SOFTWARE

FROM ONLY £1.50

CBM 64, SPECTRUM, VIC 20,
BBC, DRAGON.

SEND S.A.E. FOR FREE LIST

*First 50 replies receive a FREE GAME
(state computer type)

B.T.B. SOFTWARE
166 Buchanan Street
Glasgow

ORIC/ATMOS

Buy your Oric Software from our comprehensive range of over 100 titles.

Send stamp for price list to:

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

XMAS SPECIALS

(Order Before 15 January)

Football Manager	Spec £5.50
Micro Olympics	Spec £4.50
Chuckle Egg	Spec £5.50
Scrabble	Spec £14.00
Football Manager	CBM £6.20
Micro Olympics	CBM £4.60
Twin Kingdom Vail	CBM £7.20
Chuckle Egg	CBM £5.80

Cheques P.O.s

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

ONSPEC SOFTWARE FOR THE 48K SPECTRUM

ONE MAN AND HIS JOB
A multi-screen arcade game with a touch of strategy. Guide the intrepid traveller through the many screens of animated fun completing the various tasks.

Fully animated 100% machine code with colour and sound. Kempston joystick compatible. Just £3.99 (Please make cheques payable to J. A. Davis). From:

ONSPEC SOFTWARE

1 Jubilee Crescent, Middle Rd.,
Thrupp, Stroud, Glos. GL5 2DF.

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

SOFTWARE BARGAINS!!

COMMODORE 64	ZX SPECTRUM
Daisy Thompson £5.50	D.T. £4.90
Zaxxon £7.90	Manic Miner £4.50
Black Hawk £6.50	Black Crystal £5.90
30 Time Track £4.50	Football Manager £5.25
Handback £4.90	Jetset Willy £4.50

Send S.A.E. for full list (originals). State which micro (mail order only).

P.O.s/cheques to:

M.C.S. (U.K.) LTD.

Dept. (PCW)
24 Edward Road, London E17 6LU

MONSTER'S Arcade game for CBM 64, fantastic graphics and sound effects only £6.95. Available only from: Discus Software, Freepost, 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, Chippenham, Wills. SN15 3HU.

OVER 18's ONLY

DISCOUNT GAMES

From only £1.95

Spec., Comm 64, Vic 20,
BBC, Dragon

Send S.A.E. for free lists

M & S SUPPLIES
4 Cynthia Drive,
Marple SK6 7BB

UTILITIES

ROYBOT ASSEMBLER & machine code DEBUGGER for 48k Spectrum

New style menu driven ASSEMBLER and easy to use TESTER with DIS-ASSEMBLER, TRACE SINGLE STEP, BREAKPOINT, NON-STOP CALLS & HISTORY. Dynamic displays-instructions, registers, stack, flags, selected memory. Decimal and hex, printer and microdrive. Unique CONVERSATIONAL INSTRUCTION INPUT ASSEMBLER, EXECUTION AND RESULT DISPLAY. Microdrive cartridge £13.95. Tape £9.95 with full instructions and demo programs.

PCW Review 8 November

ROYBOT-PW, 45 Hullbridge Road,
Rayleigh, Essex SS6 9NL. Send see for details.

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.

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 "uprint" to print any or all files on a cartridge with optional dated titles. Owners of the earlier package can update by sending OUR cartridges and 25p.

CURRENT SPECTRUM PROGRAMS

Tradewind (£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 Ouen, the Dragon and Knight of La Hougue Bie, the Black Cat of Carrefour a Cendre, 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 Currah a-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 Tradewind and Morse Tutor would be £13.50. As a BONUS, Gavin Monk's Indexed Loader is included FREE with each cartridge.

available from

WD Software, Hilltop, St Mary, Jersey. Tel. (0534) 81392

1 Rowan Place, Dundee, Scotland DD30 3PH. Tel: 0382 88232

SOFTBICKS

Send cheques P.O. to:

£3.50 (inc. p.p.)

Redesigned Sprites and Sprite paths, two extra rooms included: the most and the vault

(Software Projects Approved)

NOW AVAILABLE

JETSET WILLY EDITOR MK II

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

ARROW MICRO SERVICES

20 Portmeadow Walk
London SE2

ARROW TURBO-SEVER
Fed up with waiting for those programs to load. Well you need Turbo-Sever, easy to use and faster than the 1541 disk drive, programs reload independent of Turbo-Sever. £7.00

ARROW DISKOPY
This selective disk copier will copy both PRG 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, format disks. £8.00

ARROW MICRO SERVICES
- Commodore 64 -

COMMODORE 64 USERS TAPE TO DISK TRANSFER UTILITY

This program will place, on disk, a working copy of at least 90% of all (normal speed) programs. Full disk — error handling, directory utilities inc. access to disk directory from within another program. THIS IS THE BEST AVAILABLE TAPE TO DISK

BANK MANAGER: Keeps full details of your bank account on tape or disk inc. automatically adjusting standing orders with a budgeting facility and security code entry. Full disk commands. A flexible and easy to use program.

TAPE £8.95 DISK £10.95

WISHBONE SOFTWARE DEPT P.C.W.
11 Rye Close, N. Walsham, Norwich, Norfolk
FOR THE BEST IN HIGH QUALITY SOFTWARE

ORIC-1 and Atmos owners, copy any hires colour screen accurately to Oric MCP40 printer, use in your own programs, £4.85. K. W. Griffiths, 29 Priors Walk, Belmont Rd, Hereford HR2 7JY.

48K SPECTRUM TRIANGLE FILL
The universal 2-D solid element.
"be like the BEEB"
S.A.E. & £2 for:

P. Uloth, 1 High Street, Keswick

you receive:

DATA + LOADER + DEMO

COMMODORE 64 — VIC 20
Specially designed UTILITIES giving those extra facilities that prove so USEFUL, TIME and TIME again.

BYTRE 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 most programs. RE-ENABLES computer functions, RUN/STOP RESTORE, etc. RESTORES basic/M. Code Programs after reset or crash, without problem. Just plugs into your micro, no mods needed.
(ii) A super MCode restore routine, which can EVEN BE LOADED AFTER a disaster, and still totally recover the program.
(iii) A mach code ASSEMBLER, enter mach. code easily in understandable form, IDEAL for MODIFYING or writing programs without fear, even if they crash, you can reclaim them.
(iv) Machine Code DISASSEMBLER, helps take the mystery out of M.Code. See how your favourite Programs work.
CASSETTE — £8.95/DISK — £9.95

SUPERKIT 64

COMMODORE 64 ONLY
Gives you those EXTRA FACILITIES to assist your programming. A SUPERB TOOLKIT of machine routines: Complete RE-NUMBER (incl. GOTO-GOSUB/AUTO LINE TRACE/FIND AUTO RUN/BLCK. DELETE/M. Code MEMORY SAVE and more. Software Controlled flexibility, and at a sensible price, CASSETTE — £8.95/DISK — £9.95. Both programs give almost all the EXTRA UTILITIES for writing/modifying programs.
Eliminate C2N Database Problems.

REKORDAKIT 64

COMMODORE 64 ONLY
HEAR your Cassette Performing. Keep C2N in Tip Top condition. Simple to use plug-in device TEST INFORMATION TAPE to ensure tape heads are correctly set. £6.95.
REMEMBER state Computer. Chequer-V. to ASH BYPRODUCTS, P.O. Box 510 BIRMINGHAM B179ES.

SPECTRUM ACCESSORIES

SPEEDY LOAD: Halve your waiting time! This short program lets you save/load at 3000 baud. Easy to use. Cassettes, 48K, £2.95.

TAPE CONTROL: This unique unit works via the MIC port leaving the expansion port free. Automatic on/off and load/save switching of one or two recorders from keyboard or program using BEEP command. With amplifier, volume control, save/load indicators, semi-auto switch for rewind, verify etc. Smart black case. £24.95.

TAPE SWITCH: Recorder on/off and load/save switching without lead changing. Black case with BEEP amp and volume control. £13.95.

BEEP AMPLIFIER: Sound level booster with volume control, in black case. £8.95.

AERIAL SWITCH: Two-way unit with TV lead. Saves unplugging TV aerial. £2.95; 6 ft video aerial extension lead. £2.25.

TAPE HEAD: Cleaning/demagnetising cassette. £2.45; alignment test tape. £2.95.

RELAY CONTROLLER: 4-channel, each with 4 amp 2-pole mains relay and ON indicator. The relays are BEEP operated via the MIC port. Cased, with screw terminals. £37.50.

NESS MICRO SYSTEMS

Main St., Muir of Ord, Ross-shire IV6 7SU

MICRODRIVE ONE (MD1)

AT LAST 48k Spectrum owners with m.drives, discs, etc. can now transfer the MAJORITY of their tape programs (inc headerless 48k programs those with LOW addresses — say 16384) and get them running.

MD1 has 5 programs to help YOU convert them so that they run (i.e. house-keeping progs), FULL manual and prog examples.

To transfer basic, code, or arrays to the drive use our mini tape 6MS program at £3.

Cost £6.50 inc p/p (disc owners etc ask for MD1X).

OVERSEAS £1 Europe, £2 others for each product. SEND SAE for enquiries. ALL WITH MONEY BACK GUARANTEE

LERM, DEPT WE1

10 Brunswick Gardens
Corby, Northants

KWIKLOAD

For the 48K Spectrum

This amazing utility pack allows Spectrum cassette programs to load 3 times the normal speed.

The Hobbit loads in 120 seconds
Scrabble loads in 136 seconds

Full instructions supplied to convert most commercial software — £4.95 inc or send SAE for further details.

Data View

32 Gladstone Road, Hockley
Essex SS5 4BT

Take a QUANTUM LEAP today... Make your SPECTRUM programs really come alive with up to 85 chars/screen line!

"Micro-print 85"

is THE outstanding machine-code utility which takes you far beyond the standard 32 or even 64 pitch printing formats. A constant choice from SIX widths allows:

Either 85 characters-per-line,
or 64 characters-per-line,
or 51 characters-per-line,
or 42 characters-per-line,
or 36 characters-per-line,
or 32 characters-per-line.

Any pitch, any time, any place. Mix all six within any line. COPY any 1-24 line group.

"Micro-print 85" is incredibly versatile nothing else gets near it! The 16/48k cassette plus extensive demo of all features is £5 (£6 export) from

MYRMIDON SOFTWARE
PO Box 2, TADWORTH, Surrey KT20 7LU

SERVICES

SINCLAIR COMPUTER REPAIRS

SPECTRUM	£14.50
ZX81	£11.00
ZX PRINTER	£12.00

Inc. parts, p.p., and return insurance.
Spectrum upgraded to 48K for £24.
Fast turnaround — we like to take care of your computer — please pack carefully — and send with cheque or P.O. to:
I.T. (WESTERN) ELECTRONICS
97 Newtown, Trowbridge,
Wilts. BA14 0BB

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.

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

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

Silicon Services

YOUR NORTH-EASTERN REPAIR CENTRE
FOR ZX81/SPECTRUM REPAIRS

*Spectrum repairs	£16.00
*ZX81 repairs	£11.00
*ZX Ram pack	£11.00

All inc. of parts, insurance, p.p.
100 day guarantee given on repair

SILICON SERVICES
14 Tintern Road, Skeelton-in-Cleveland
Saltburn-by-the-Sea, Cleveland TS12 2YN
Tel: 0287 52059

PROMPT-EPROM copying (2732/64/128) £2.50, Hexadecimal Rom listings £1, Eprom erasing 50p, also will supply Eprom P.O.A. Enquiries 061-652-2165, 24 Swinside Rd, Bolton, Lancs BL2 5NG.

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

BBC SPECTRUM REPAIRS

* Spectrum repairs £18.50 inc. parts insurance and p.p.
* BBC B repairs £18.50 + parts, insurance and p.p.
Send your computer with cheque or P.O. for £18.50 and description of fault to:
SUREDATA (PCW)
Computer Service
45 Wychwood Avenue, Edgware, Middx.
Tel: 01-951 0124

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.

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.

BUSINESS SOFTWARE

SPECTRUM Software for business / practical users, microdrive compatible. Send sae/irc for catalogue. SD Micro Systems (Dept PCW) PO Box 24 Hitchin, Herts. prompt despatch.

ACCESSORIES

The M184 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 enc. £1.60 UK, I.O.M., Eire, C.I.
- No hidden handling charges.
- Special rates for school.
- Please phone for appt.

MANCOMP LTD. (dept. PCW)
Printworks Lane, Levenshulme, Manchester M19 3JP Tel: 061 224 1888.

ENGINEERS!!
MANCOMP URGENTLY NEEDS MORE STAFF
(WRITE OR PHONE)

MONITOR QUALITY PICTURE

Simply plug the Modem 3 between your computer and any television for a sharper, steadier picture.
Send SAE: stating computer type.
Only £29.95 + £1.75 p.p.
Send cheque/POs payable to:
Solar Computer Products,
P.O. Box 4,
Monmouth, Gwent NP5 4YZ
Tel: 0600 860661

Self Adhesive Cassette & Disk Labels

CASSETTE LABELS - On A4 sheets, 12 labels per sheet, 100 labels - £3.90, 1000 - £21.85
Rolls of 500 labels, on tractor feed backing paper for overprinting by computer printer.
White - £14.66, Tints available - Blue, Yellow, Pink, Green, Orange or Grey - £16.90.
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 (0795) 29425 (24 hrs.)

INDUSTRIAL PROCESS

Self Adhesive Labels - SUPERFAST
Unit A4, Smead-Dean Centre, Eurolink Way
Sittingbourne, Kent ME10 3RN

BLANK CASSETTES AND DISKETTES.

Quality Cassettes and Diskettes at competitive rates.

Quantity discounts available.
E.G. 100 C15 inc. library case £0.25p. each + VAT.

Call or write for price list.

ACCLAIM LTD.,

The Haven,
Somerset Road,
Redhill, Surrey.
Tel. 07372 41551.

Replica Loud Firing Colt 45 Automatic, 23 shot
As used by US Army, ideal stage prop, with ammo £5.35 carriage 50p



Snub Nose Colt 45 replica.
As used by U.S. Police Department, ideal stage prop, with ammo. £3.75 carriage 50p.



Colt Python 357
As used by Police and screen heavies, with ammo £4.45 carriage 50p



Ideal for video film making. (Mail order only.) Send PO or cheques to: Razzamatazz, The Lodge, Lynce House, Links Rd., Worthing, W. Sussex.

NO FUSS LOADING

with the

LOADMASTER

when loading in future the built-in meter will give you a correct setting EVERY time.
Just plugs between recorder and computer. Price inc. P&P £11.49
Probmaster Ltd, 23 The Ridgeway,
Cuffley, Potters Bar, Herts EN6 4BB

FOR THE PERSONAL IN YOUR LIFE

Quality T-shirts and Sweatshirts Screen printed in red on white
T-SHIRT (4-50) SWEAT (8-50) size, cheap, P.O. to:
"CORPAC", 18 Bechwood Mt. Leeds, LS4 2NQ
Tel: 0253-784669



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

BLANK CASSETTES

10 C10's for £3.85; 100 for £25.00
10 C15's for £3.85; 100 for £26
10 C20's for £4.00; 100 for £27.00
FULLY GUARANTEED, inc. P&P
C.O.D. add 50p. Immediate Despatch.

U.K. HOME COMPUTERS

62, Churchward Ave, Swindon, Wils.
24 HR Order Phone 0790-695034

BLANK CASSETTES

C10 £2.95 FOR 10, £22 FOR 100
C15 £3.05 for 10, £23 for 100 inc. p+p
FULLY GUARANTEED
Send cheque/PO to:
G.R.P., 369 Mile End Road,
London E3 4QS. Tel: 01-990 1186
ACCESS ORDERS BY PHONE

DISK USERS

CDS D/S D/D — £13.60 for 10
Blank disks (mk1 loaders) £15 for 10
Datalife S/S S/D £16 for 10
Dysan D/S D/D £24.80 for 10
Scratched disk can be regained with "Get-it-back" — only £6.99
All items 70p P&P
LOST 'N FOUND SOFTWARE
17 Pittfield St., London N1

CHEAP 5" diskettes, seconds but guaranteed reliable, mixed SS/DS, ideal for software distribution £1 each or £8 for 10. Tel: Woking 71563 (after 7pm).

SOFTWARE

DISCO SCREEN

ADD A NEW DIMENSION TO YOUR MUSIC and MORE. A totally NEW EXPERIENCE. Actually LISTENS to your MUSIC, and REACTS to it. Watch as it takes up the MOOD of the MUSIC, and produces FABULOUS, FASCINATING EFFECTS on screen. DISCO version is IDEAL for parties or to amaze your friends. RELAX version provides SUPERB background as you enjoy quieter moments.
CASSETTE £17.95 MICRODRIVE £17.95
ASH BYPRODUCTS, P.O. BOX 910 BIRMINGHAM B17 9ES

AMSTRAD & SHARP

Software by post, same day service
Business, utility, games, education eg Databank £10, Amstrad Quickload £7, Sharp Compiler £14, Reportwriter £8.
SAE for catalogue — please state machine.

DSC (PCW) 38 South Parade
Bramhall, Stockport SK7 3BJ

CBM 64 higher or lower card game, wage bets on the turn of each card only £4.50 send cheque P.O. to A. Isaacs, 3 Wayside Close, Southgate, London N14.

GO BEYOND HERE COMPUTING....
ZX BIG-SHOT
SUPERPRINTER
THE FIRST SPECTRUM SUPER-UTILITY

FOR £6/48K
£5.99
ZX SPECTRUM

COMPOSE INSTANTLY ON-SCREEN
IN DOZENS OF STUNNING STYLES!
POUR IT THROUGH YOUR PRINTER
ANY HEIGHT...ANY WIDTH UP TO...

MACHINE-CODE
MAGIC
FROM BOX-SETTING TO
ANY SIZE, ANY STYLE,
IN SECONDS!

10 FEET WIDE X **6 FEET HIGH**



THIS ADVERTISEMENT HAS BEEN MADE USING ONLY A 16K SPECTRUM AND ALPHACON 32 PRINTER.

JUST IMAGINE WHAT YOU COULD DO WITH ZX BIG-SHOT!

BUTTERCRAFT SOFTWARE

14, WESTERN AVE., RIDGESSON, KEIGHLEY, YORKS., ENGLAND.



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

**Call
Diane
Davis
on
01-437 4343**

BARCLAYCARD
VISA

STOCK CLEARANCE of brand new Business & Utility programs, due to re-design for Microdrive. We wish to clear this stock at cost prices.

IT SHOULD BE NOTED THAT PROGRAMS WILL NOT WORK WITH INTERFACE 1. — PLUS 80 PROGRAMS WORK ONLY WITH KEMPSTON 3 INTERFACE.

	Usual Price	Price Now
ZX81 M/C Test Tool	£ 9.95	£2.50
Spectrum M/C Test Tool	£ 9.95	£2.50
Spectrum Editor Assembler	£ 9.95	£2.50
Plus 80 Editor Assembler	£19.95	£3.50
Plus 80 Address Manager	£19.95	£4.50
Plus 80 Finance Manager	£19.95	£4.50
Chess 'The Turk'	£ 8.95	£4.50

Price inc. VAT & Post in UK

POST ORDER TO:
Oxford Computer Publishing Limited,
4a High Street, Chalfont St. Peter,
Buckinghamshire SL9 9QB

PLEASE RUSH ME:
Send cheque, postal order or Access No. to above address. Or telephone order with Access No. to (0753) 888866.

NAME
ADDRESS
ACCESS NO:

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, Freepost, Windmill Hill, Brixham, TQ5 9BR. Tel: 080 45 55532.

CHIBUR 48k Spectrum, Takeover, Designer II, Musicomposer, Meteor-Rescue, Attack of the Empire, £5.95p (p&p incl) Cheques, trade — programmer enquiries: — Chibur, 3 Lonsdale St. Leicester LE2 1BP.

CHRISTMAS OFFERS. Home Accounting System, £7.95 + FREE blank cassette, fully MICRODRIVE compatible, menu-driven, containing — Cash-flow, Budget, Tax, Motor and Report-Generator, Pools Forecasting System — £4.50 Scientific formula forecasts most likely draws for English and Scottish leagues, updated each week by user. Supplied in presentation video cases, cheques P/O to: Mistral Software Dept PCW, 241 Forest Rd, Tunbridge Wells, Kent.

DUPLICATION

Dear Reader, my name is Simon Steble. I specialise in real time data-duplication for most cassette based micros. Disc copying for BBC 40.80 (protection available) Dot-matrix printed labels, blanks, Blank cassettes.
FAST TURNOVER 0869 252831 COMPETITIVE PRICES
P.L. FREEPOST, 46 WERTEND, LAUNTON, OXON OX8 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. (0283) 38199.

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
Burntwood, Walsall, West Midlands.
0543-480887 or 05436-75375 (24Hrs)
Data duplication, quality cassettes, printing, distribution to customers with competitive prices and fast turn around.
Price lists and samples on request.

EXHIBITIONS

MICRO COMPUTER
EXHIBITION
SAT. JAN. 12th 1985
BROMLEY, KENT
INFO; EAST-WEST
TEL: 01-290 5299

THE BARGAIN FILES
ALL YOU NEED TO KNOW ABOUT THE
NEWBRAIN £9.50 PUBLISHED JANUARY '85
VITAGRAPH LTD. 26 COLLEGE ROAD
BROMLEY, KENT BR1 3PE

MAGAZINES



DRAGON USER

To make the most of your Dragon you need **Dragon User** — the independent magazine for Dragon owners. To make sure that you receive a copy of Dragon User regularly subscribe direct to us. A year's subscription costs £10 for 12 issues (overseas rates available on application). Send a cheque or postal order made payable to Dragon user, and accompanied by your name and address, to: Dragon User, Subscription Department, Oakfield House, Perrywood Road, Haywards Heath, Sussex RH16 3DH.

COURSES

★ COMPUTER COURSES ★

Software and Hardware
We offer courses to suit all computer interests, from the complete beginner to the degree level student. The courses are all informal and tailored to YOU.
Send for full details to:
Jaysoft Micro Developments,
Blackadder Bank,
Green Law,
Berwickshire,
Tel: 036-18-458

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.

QL CLUBS

FED UP WITH
Q.L.U.B?
THEN WHY NOT JOIN
I.Q.L.U.G.,
THE INDEPENDENT Q.L.
USER GROUP
Contact: The Secretary, Brian Payne
24 Oxford Street
Stoney Stratford
Milton Keynes, Bucks

QL SOFTWARE

Q.L.!! AT LAST!

A totally menu-driven, user-friendly graphics package for the Sinclair Q.L. two programs in one...

RECORD-DRAW AND PAINT

Create hi-res. pictures with ease to use in your own programs or you can "RE-PLAY" the whole drawing process to watch your pictures take shape... Ideal for moving displays etc. or just for fun. No programming knowledge is needed to create fabulous screen designs.

For your copy on microdrive cartridge send £12.50 (cheque or P/O payable to Midssoft (Software)). Your order will be dispatched with 4 days.

Send to: Midssoft, 34 Oakfield Road, Finsbury Park, London N4

QL PAINTBOX

Complete drawing package for your Q.L. QL PAINTBOX will save your pictures as a screen, dattable or it will even compile a superBASIC program from your picture. Includes full save/load/delete facility. Only £9.50 or £4.50 if you send your own cartridge. Price includes P+P+manual.

J+D SOFTWARE
3 Alfred Road, Lorton, Warrington

HARDWARE

SAVE £££'s!!

Amazing prices on Spectrum, Q.L., Commodore, BBC, Monitors, Printers, etc.

E.g. Q.L. £379.00
(inc. p+p, VAT).
48 HRS (or less) Delivery

Dove Communications
Tel: 0521 891715

EDUCATIONAL SOFTWARE

MATHSAIDE for BBC-B and electron, provides help with O-level mathematics, uses full sound and colour capabilities, only £3 inc. p&p immediate delivery, send cheques or p.o.'s to EDSOFT, 12 Pollock Rd, Bearsden G61 2NJ.

BOOKS

The ATARI 600XL Program Book

Games · Educational ·
Graphics & Business
£5.95

Getting Started with the ATARI 600XL

A wealth of useful hints
easy to read and understand
£5.95

SPECIAL OFFER · BOTH TITLES £9.95

Cheques / Postal Orders to:

PHOENIX PUBLISHING ASSOCIATES LIMITED
14 VERNON ROAD, BUSHEY, HERTFORDSHIRE WD2 2JL

AMSTRAD

AMSTRAD CPC464

ARNOLD BLACKWOOD — ADVENTURER EXTRAORDINAIRE
THE TRIAL OF ARNOLD BLACKWOOD A very worthwhile addition to the Adventures' 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. CQs/POs to
NEMESIS, 10 Carlow Road, Ringstead, Kettering, Northants NN14 4DW.
Tel: (0933) 623967

!AMSTRAD CPC464!
SPHERE / SOFT
presents
10 AMAZING SUB-ROUTINES
CREATE SPECTACULAR GRAPHIC EFFECTS
includes SCREEN UNFOLD, SHAKE & SCROLL
ON CASSETTE WITH INSTR'S AND DEMOS
£5.50 (P.P. Inc.) MAKE PAYABLE TO:
CSC, COMPUTERS, LISBURN RD
YSTRAID MYNACH MID GLAM

MODEM III NOW COMPATIBLE WITH AMSTRAD GREEN SCREEN MODEL FOR USE WITH COLOUR T.V.
SEE ACCESSORIES.

SOFTWARE FOR YOUR AMSTRAD AMSOFT GAMES

CHESSE ROLAND IN CAVE HARRIER ATTACK
CUBIT ROLAND IN TIME CRAZY GOLF
PUNCHY ELECTRIC FREDDY GEMS
STRADUS ALIEN BREAKIN SULTANS MAZE
GP DRIVER LASER WARP HUNTER KILLER
SPANNER MAN

ONLY £7.00 EACH
GUIDE TO BASIC £15.00 SPREAD-SHEET £15.00 WORD-PROCESSING £9.00
HOME BUDGET £15.00 DEV/PC ASSEMBLER £20.00

AMSTRAD JOYSTICK ONLY £9.95
P&P PLEASE ADD 25p PER ORDER
CQs/POs TO M.J.C. SUPPLIES
'SCOJA', LONDON ROAD, HITCHIN
HERTS SG4 9EN

FOR SALE

MANCOMP M184 keyboard, unwanted Xmas gift offers tel. 061-224 8302 (after 8pm)

DRAGON software mostly microdeal £3.50 each, new Trojan light pen £6, pair Dragon joysticks £10. Tel: Bourne End 20024 evenings.

ACORN Electron Plus Pye recorder £50 worth, books/mags, large amount software cost £340 accept £230, all exc. cond. Tel: 061 499 2592 Wythenshawe area.

AMSTRAD CPC464 + colour monitor, joystick, software and advance manual boxed, guaranteed, hardly used, £320 ono. Tel: 021-551 4201 before 7.30pm.

FOR SALE SOFTWARE HOUSE

For Sale as a going concern. Established, reputable Software House with 17 Copyright titles. All stocks, advertising materials, show displays and Copying Plant included.

Excellent accounts and goodwill. An ideal opportunity to get into the software market with a 1st class name.

Genuine enquiries only to: Mr A. Hamblett, Dennis House, 2nd floor, Marsden Street, Manchester M2 1JD.

SELLING OR BUYING a used computer/equipment in London and the home-counties? The Computer can help you! Tel: 0375 642434 (anytime).

WANTED

WANTED

Programs for BBC, Electron, Amstrad and Spectrum. No promises, except, if your program is saleable, we will either market it ourselves or try to place it elsewhere (as your software agent).

Send programs (tape only) to:
SOFTWARE LIAISON
8 Darwin Road, Welling, Kent.
Phone: 01-304 3411

MAKE YOUR PROGRAMS MAKE MONEY!

If you have a game, utility or application to sell, with a view to publishing, (particularly CMB64 or BBC B) phone

JOHN COOK ON:
01-437 4343

THIS SPACE FOR SALE

£18

TELEPHONE:
PCW CLASSIFIED
01-437 4343 Ext 206



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.

WANTED

TOP CLASS CBM64 SOFTWARE
FOR SALE IN AMERICA
WHITE
108 Lawnswood Avenue, Shirley
Solihull B90 3QU

WANTED: Top cash paid for home computers and accessories in good condition. Bring or mail (phone for quote). Computamart, 195 Seabourne Road, Southbourne, Bournemouth. Tel: (0202) 433759.

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.

Computer Swap 01-437 4343

Free readers entries to buy or sell a computer.
Ring 01-437 4343 and give us the details.

Spectrum for Sale

SPECTRUM S/W Originals: Lords of Midnight £6, Monty Mob £3.50; both as new. Tel: Tony Pandey (0443) 430984.

SPECTRUM 48K 1 week old, ZX interface, ZX microdrive, all boxed with 2 cartridges; microdrive utilities, Kempston joystick interface + joystick 200, mags, £90 of original s/w. £270 o.n.o. Tel. Hornchurch 42647.

SPECTRUM 48K for sale with Kempston Interface and Quicksilver. Joystick + 300 worth of s/w originals only. Tel: Justin 723 2608.

SPECTRUM 48K tape recorder, sound amplifier, £200 worth of games including Jet Pac, Automania, Jetma, Football, Manager, Adventures A-D and many more sell for £150 o.n.o. Phone Alloa (0259), 72009 Alan.

KEMPSTON JOYSTICK + Spectrum interface, very good condition. Boxed. £15. Tel: 0623 759724 (Notts area)

SPECTRUM SOFTWARE Golden Baton, Arrow of Death(1), Circus £3.50. Colditz, W.T.H.A.S., Bugaboo, Omega run, £2.50. Plus others £2 or swap for other adventures. Tel: 01-505 5905.

SPECTRUM SOFTWARE Hobbit £8.50, Jet set Willy, £4, or swap both for any joystick interface. Write to: R Shah, 84 Spring Grove Crescent, Isleworth, Middlesex, London TW3 4DB.

48K SPECTRUM with manuals, leads, box etc. Also Kempston joystick interface and lot of software + £26 of magazines, ideal christmas present, sell for £140. Contact Somerby 418 (Leics).

48K SPECTRUM in excellent condition and rarely used, with manuals, software is Chequered flag and Hungry Horace. Bargain price at £95. contact David Evans Tel: gresford 2939, after 5 pm.

SPECTRUM 48, Interface I, microdrive ZX printer, prism VTX 45000. Modern,

Maplin full size keyboard. All as new with manuals. Loads of s/w, carry case £220 o.n.o. Tel: Reigate (07372) 47715.

48K SPECTRUM 1 month old, tape recorder, Kempston interface, Quicksilver Joystick. £60 of books, £50 of original games, inc. Full Throttle, Match Point etc. Mags, Currah Speech Unit £275. Tel: Farnworth 71487 4 pm.

SPECTRUM ORIGINAL games for sale telephone 699 7093.

SPECTRUM SOFTWARE over 30 originals including Sabre Wulf, J.S.W., Manic Miner, Splat Scope and Chuckie Egg. All well known titles worth over £220. Sell for £60 or will split ono. Chelmsford 421265.

SPECTRUM VTX 5000 modem, mint boxed, £60, Valhalla, Hobbit, Fithe, Hurg, Artic Forth, Scope 2 £6. Wheelie, Fighter Pilot, JSW, Lunar Jetman, Jumbly, Code Name Mat, Bridge £3 Tel: Sheffield 460004.

48K SPECTRUM boxed with manuals, leads + compatible cassette recorder. Over £90 of software + lots of mags — £95 Tel: 051-430 6504.

NEW 48K Spectrum + leads + DK Tronics keyboard, joystick + interface. Tape Recorder, s/w inc: Beach Head, Decathlon etc: £150. Tel: Redhill 67335 (Kevin) work no.

SPECTRUM 48K interface 1 + 2 microdrive + 6 cartridges, joystick + interface, cassette recorder, s/w and books. £280. Tel: Bournemouth 526 424.

SPECTRUM 48K + Microdrive + interface 1 + Protex switchable joystick interface + s/w inc: White Lightning, Sabre Wulf, Eureka, Sherlock, £380+. Sell for £250. Tel: Jerry, 01-738 0491 W/days after 4pm.

48 SPECTRUM Interface I, Microdrive, Kempston joystick, Cheetah micro-speech, magazines + games. Sell £275 or swap for BBC B 1-2. Tel: 041-638 5425 after 6pm.

BUG-BYTE Cookbook, two cassettes, new unused, boxed, unwanted gift. £6.50 Tel: 0428-713019.

SPECTRUM 48K complete machine code tutor mc. For absolute beginner. Abersol, Forth, Grand Prix Manager, Football Manager. Worth £49.75. Will swap for Sharp PC1500 or Interface or sell £25. Tel: 01-859 2798.

SPECTRUM S/W eg. Beach Head, Travel with Trashman £3.00. Onetron, Thrusta, Push Off £1.50. Painter £2.00 each. Tel: 01-573 4044 (eves Bob).

ZX SPECTRUM 48K, boxed, Kempston joystick, cassette recorder. £280 of original mags. £240 ono. Tel: Loughborough 231393.

48K SPECTRUM, Kempston joystick interface, Quicksilver joystick, tape recorder + much s/w and mags. Total value £400. At £225. Tel: Milford Haven (Dyfed) (06462) 3182

SPECTRUM S/W for sale, loads of titles, 1/2 price or less (all original) also various magazines for sale. Tel: 01-949 0225. Ask for Mr Makan.

FOR SALE Spectrum educational originals. Post free. £3.50 each. Geography, Paddington shopping, Griffin Numberfun, Look Sharp, Count with Oliver, Castle of Dreams, Sam Safety. Phone 01-800 6767 after 7pm.

ORIGINAL Spectrum software: Ad Astra, Boogaboo, Tranz Am, Punchy, Escape from Arkaron, Into the Empire, 16148, No.6, No.7, only £3.50 each! A. Ashton, 93 Allcroft Road, Birmingham B4 3EF.

STACK Light rifle with software + joystick + sound amp + £80 software etc...Cost £150. Swap for interface 1 + microdrive or Spectrum Modem or sell £75. Printer wanted. Tel: 0342 713422 Sussex area.

SPECTRUM software: River Raid, An-

droids, Mad Martha, Knights Quest, Zoom, Raider of the Cursed Mine. £2 each or £10 the lot. Tel: AbSon 2477. Will send!

48K Spectrum plus, Kempston joystick, plus games, plus books, plus magazines. All good condition and boxed. Price £150. Tel: Harpenden 64080. After 6 o'clock.

SPECTRUM GAMES for sale - original Hulk, Danger Mouse, Arcadia, Lunar Jetman, Buggaboo, Manic Miner, Terydactyl, Jet Set Willy, Beach head, Ant Attack, £3/4 each. Tel: 01-505 3245.

48K Spectrum + games, books, mags. £80 for quick sale. Tel: 0865 242701.

SPECTRUM 48K. Over £500 software, Kempston interface and Quickshot joystick still under guarantee. Excellent condition. Bargain £150. Tel: 4551043 after 3.30 pm.

ORIGINAL Spectrum software: Reversi, Blue Thunder, Androids, Galaxy Attack, £3 each. Hobbitt: only £8! Cattapilla, Gobble a Ghost, Schizoids, Planet of Death, Atic Atac, £2.50 each. Rifle Range £1. Bristol 777593.

SPECTRUM software for sale. 20 original tapes also 5 books plus VTX5000 modem. Will sell the lot for £85.00. Phone: 0493 853920.

SOME Spectrum s/w eg. Danger Mouse, Daley Thompson, £3 all original. Tel: 061 450 6689.

SPECTRUM Software: Alchemist, Scuba Dive, Lunar Jetman, Fred, Chuckie Egg, M Coder II, The Pyramid, plus many more. All originals. Only £3 each. Phone (0455) 611777.

SPECTRUM 48K + software + tape deck + mags - whole system over £600 +. Offers to Andy 0514 307608 or will consider swap for Atari 800XL plus drives (software also appreciated) Ugh! 48K Spectrum, £190 s/w, Tape recorder, Int 2, dust cover + Sprint 4times faster tape loading. All for £260. Worth £450. Must go. Phone Andy (0933) 317858.

48K Spectrum, original software: Kaleidoscope, Death Alley, Meany Monster, Alien Armada, Night Raider. £3.50 each. £15 the set. 4 St. James Court, Wicklemarsh Road, Blackheath, London SE3 ONE. Phone 01-856 8773.

SPECTRUM 48K brand new unwanted present with some software, bargain for Christmas £100. Tel: 01-636 9636 daytime.

48K Spectrum with new dk'tronics pro key board, printer + interface, Quicks-hot II joystick and 23 original s/w games tape cost £405, will accept £195 ono. Tel: 0924 258430 (Wakefield) Yorks.

SPECTRUM 48K as new 30 keel, manual etc, offers Sinclair ZX Interface I + Microdrive + cartridge, offers Casio TV 100 pocket computer, offers. Tel: Hornchurch 42642 after 4pm.

SPECTRUM s/w for sale incl. Jasper, Turmoil + Zombie. Tel: Sam 01-368 3784 after 4.30 pm.

48K Spectrum Fuller FDS keyboard, sound amplifier 3 joystick interfaces, Currah Speech Plus 182 games simulation etc, Decathlon Combat Lynx all originals, £350 ono. Room 7, 18 Victoria Park, Dover, Kent.

Ataris for sale

ATARI VCS with 35 cartridges, 3 joysticks, paddles, video, touch pad and cartridge box. Worth over £550, ideal xmas present at £200 ono. (includes Phoenix, Enduro, Smurf, Defender) Tel: 091-2852003 (Tyneside).

ATARI 800 + cass. + s/w + books + mags + basic + manual, excellent cond. £180 or swap for CBM64 + C2N. Buyer must collect with phone number. S.Sanger, 30 Station Ave, Wickford, Essex SS11 7JS.

ATARI 800 48K, unwanted prize, very good condition, £100 ono. Tel: Threadwood 354 after 6pm.

ATARI 800 48K with 410 cassette, many top selling games including Astro chase & Pinball, Basic, Manuals, Joysticks boxed as new. £175 ono. Tel: 0225 810132 or 0249 655854 after 6pm.

ATARI 600XL cassette unit, joystick, tape, s/w original, 7 cartridges, books and magazines. Sell for £210 ono. Swap for CBM64 + tape unit. Tel: J. Gablehouse. 0622-4745.

ATARI 600XL 16K tape recorder 4 original cassettes 3 cartridges, excel. graphics, boxed, vgc., £85 ono. Tel: West Malling 848499 ask for John 5pm onwards.

ATARI 400/800 software all original and brand new, mostly cartridges £5 each or 10 for £45 or 20 for £80 ono. Tel: (021) 749 4603 ask for Pete.

ATARI 800, 48K joysticks basic cassette program basic cartridge Pacman Asteroids and Star Raiders cartridges, all good condition only £80, 3 Lord St, Great Harwood, BB6 7DX, tel. 0254 885113.

ATARI VCS with joysticks, paddles leads, etc, 7 games including defender and pack-man, good cond., £70 Tel: Guiseley (0943) 77001 eves.

CBM64 s/w to sell, many new titles, original for sale only. Tel: 0705 37379.

CBM64, C2N, manual, over £60, of software all original £80, worth of new books, cost £420, sell for £320, only reply to every letter, 57 Sycamore Avenue, Milnsbridge, Huddersfield HD3 4SG.

EDUCATIONAL game for CBM64 Choochoo for ages 5-11 can be made to your own special requirements, superb graphics, a bargain at only £4. Tel: 021 742 6334.

Acorns for sale

BBC B Computer with Ferguson TX 14" television, Tandy DGP-115 printer and interface, games, books, and leads. Approximately £770 ovno. Tel: Coventry (0203) 614924 evenings.

BBC Computer software for sale, including Elite, Dune rider and Gateway to Karos. Together with 30 quality games. £165 including delivery. All originals. Phone Sevenoaks 454717. Cost new £300.

FOR SALE BBC B, DFS, disk drive, 100K, View 2.1, ideal for wordprocessing £500. Tel: Cardiff (0222) 485684.

ACORN Electron with all inc: leads, manuals £35. Computer tape recorder + £50 of s/w. 8 months old, under guarantee. £150. Tel: Sheffield (0742) 551235.

BBC B, Cumana double disk drive and lots of cassette software. Brand new unwanted presents. £600 the lot. Call Wendie Pearson, 01-251 6222 (day) or 385 5817 (eves).

ELECTRON for sale. £165. immaculate, hardly used + software, magazines, books and leads. Worth over £250. Tel: 01-959 5767.

BBC Software for sale. All originals. Hobbit £7, Vision's Snooker, Blagger, Killer Gorilla, 3D Bomb Alley, Program Power Chess £4 each. Tel: Darlington (0325) 55410 after 4pm.

ELECTRON s/w for sale. Twin Kingdom Valley £4.50. Cylon Attack £4.00. Elite. Unwanted gift. £10 Tel: 061-368 6935.

COLOUR monitor for sale £115 + leads for BBC. Leeds 560102 after 4pm. £200 of BBC s/w, all original, excellent condition. From £3.00 each. Tel: 0222 867086.

BBC 32K software: Galactic Commander £3.00, 737 Flight Simulation (Salamander) £5.00, Twin Kingdom Valley £5.00, Blagger £5.00, Adventure Quest (L9) £5.00, Eldorado Gold £1.00. Originals only. Tel: 0258 840357 w/e.

BBC SOFTWARE half price, Starship Command £4.95, Overdrive £3.95, Pole Position £6.45, 3D Grand Prix £4.00, Gorp £3.00, Monsters £4.55, Killer Gorilla £4.00, Vortex £3.90. Tel: Chelmsford 0245 50432.

BBC B double-sided disk drive + double density interface + cleaning kit. Box of 8 disks + £100 of s/w inc: TaPe + disks. All original under guarantee. Worth £770. Sell £570 ono. Tel: John w/d after 4pm (061) 8814496.

AQUARIUS Computer + expansion unit + joystick + 16K + printer + games + manuals. All boxed with leads £110. 0935 813829 after 5pm.

BBC SYSTEM, Hobbit microdrive, printer, Acorn speech, Wordwise, Aid, Toolkit, Graphics, Graphic dmp, Delta

handset, sidewise ROM board + more. Offers around £800. Write Moe, 19 Wainfleet Road, Skegness, Lincs.

Tandys for Sale

VIDEO GENIE System EG300E. Built in cassette unit. £100 of s/w + books, manuals. All perfect condition £150. Tel: 01-674 2091. Tony Anderson.

TANDY CGP 115, 4 colour printer plotter, with spare pens, dust cover, manual, and leads to connect to Dragon. £125 vgc. inc: postage. Tel: Whiteabbey 63388. Iain.

TANDY TRS 80 16K L2, tape recorder, software, games, programs, manuals, books. As new £150 ono. Holmes Chapel (0477) 32376.

TANDY TRS-80 Mod I level2 + expansion interface + monitor + cassette recorder, 48K memory, upper & lower case, numeric key pad, manuals, programs £150. 0935 813829 after 5pm. or swap for Acorn Electron.

Dragons for sale

DRAGON 32 with MCP-40 colour plotter, cassette player, joystick, light pen, 19 original titles including: All Dream Assembler, 3 books + all Dragon users. Sell £175. Tel: (061) 796 8341.

DRAGON 32, disk drive, Dragon DOS, disks, yotsticks, cover, £400 + of original software, leads, magazines, books listings all boxed in vgc. Worth £900 +. Sell £400 ono. Ring Ian evenings, southampton 695236.

DRAGON 32 + Cassette recorder, leads, 3 joysticks + lightpen, 1 cartridge, books, mags, loads of software eg. Donkey Kong, Frogger, Golf etc. vgc. £170 inc. Postage. Tel: White Abbey 63388.

DRAGON 32K Computer plus PSV leads + manual + 2 joysticks and s/ware. £80 ono. Tel: Harlow 32192.

DRAGON Software - top titles from Microdeal, Dragon Data, A & F, Salamander. Also Gemini Spreadsheet and Textstar wordprocessor. All titles original and half price. Tel: Ian on Bradford (0274) 583734

DRAGON 322 joysticks 20 games, utilities, 1 cartridge 4 books, DU and Rainbow mags. £140 ono. Write to A.J. Pimperton 122 Elmsdale Ave, Little Heath, Coventry.

DRAGON 32 plus £100+ software (includes Telewriter and Database) for sale. Owner upgraded to Dragon 64, and disc systems. Price £100 ono. (Could include books if required). Tel 01-960 0684.

DRAGON printer 80 col. thermal with cable, etc: ready to use. Only £40. Tel: Wane 68264 (Too heavy to post) 15 DRAGON games for sale, titles

COMPUTER SWAP

Computer Swap entries are limited to 30 words. Either fill in the accompanying form and send to Computer Swap, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD or telephone 01-437 4343.

All software offered through computer swap must be in original condition and for private sale only.

It cannot be swapped.

Warning: It is illegal to advertise pirated software.

COMPUTER SWAP

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

Name.....

Address.....

Telephone.....

include Buzzard Bait, Ughl and Hunchback. Was once £100. Sell £50. Tel: 01-730 1688.

Commodores for Sale

CBM 64 s/w for sale, Summer Games, Raid over Moscow, High Noon, Havoc, Axtex Challenge, and many more new releases. Tel: (0902) 734050 ask for Gaz after 4pm.

CBM 64 1541 disk drive, disk joystick, Cassette interface. £300 or will swap for Amstrad, CPC 464. Tel: 0342 833574. **SIMONS BASIC** CBM64 130 ono. Tel: 0438 316780 (Stevenage).

NEARLY £600 of s/w for Vic-20. Plus 1.6K switchable memory. Originals only. Sell at £300 ono. Tel: Chris 0472 53619.

VIC-20 16K Ram Pack £20. Tel: 01-701 9485.

FOR SALE Vic-20 + Cassette unit + 8K RAM + Introduction Basic 1 + Books + £50 of software, worth £230. Will sell for £150. Tel: 0475 696587. Phone anytime.

VIC-20 Cassettes for sale. All originals. Very cheap and in excellent condition. Rabbit, Anirog, Interceptor, Imagine and many other software houses. Tel: 0689 54609 after 4pm. Ask for Martin.

VIC-20 Starter Pack plus switchable RamPac plus Super Expander 9 game cartridges 15 game cassettes, assembly course, other oddments. Worth £400. Sell for £240 ono. Swindon 642533 after 5pm.

VIC-20 plus C2N cassette player, 8K RAM Pack, books, s/ware, joystick and chlopieter cartridge. £95. Tel: 01-854 6895.

VIC-20 + C2N cassette + 1 game (Meteor Blaster). Very good condition. Sell for £70. Tel: 241 0370. Ask for Ali.

EXCELLENT Condition Commodore 64 + Cassette with over 60 games inc. Beachhead, International Soccer etc. Joysticks + Speech + books worth over £900. Offers £350 ono. Tel: Andrew 614157.

VIC-20 Complete Starter Pack + free s/w (originals only). books. £80. Tel: (6-9pm) 01-949 1334.

VIC-20 16K switchable Ram Pack, joystick, cassette recorder, 4 cartridges, £100 of original s/w. £110. Tel: Nazeing 3207.

16K SWITCHABLE Ram Pack for Vic-20 vgc. Only £15. Tel: 061-480 2445 after 5pm. (Ask for Petr).

GOODIES, rarities for Vic-20 and CBM 64. Great software from UK and USA. For large graded lists please send s/w to John Keogh, 30 Highwood Avenue, North Finchley, London N12 8OP.

CBM 64 with cassette unit, joystick + 1 game £180. Tel: Kidderminster 0562 744690.

VIC 20 + cassette unit (boxed). 3K Super Expander, Joystick, £100 of original s/w. Ideal xmas present £130. Tel: Thorn (0405) 813772.

CBM Printer as new, boxed. £170. Thorn (0405) 813772.

VIC 20 16 Expansion, 3K Super Expander, C2N recorder, Stack Light rifle. 7 Cartridges, games, 64 original cassette games. Introduction of Basic I & II, 12 programmable books £225 ono. Tel: Orpington (Kent) 29067.

VIC 20 s/w for sale, Panic, Arcadia, Tornado, Gridrunner, Crazy Kong, Metagalactic Llamas battle. All original and in excellent cond. £20 the lot. Clarkson 42, Morecambe Street Liverpool 6 L6 4AX.

CBM 64 software for sale. Genuine. All Level 9, Twin Kingdom, Hover Bover, Heroes of Karn, Classic Adventure, The Boss, etc. Valhalla, Beachhead, Pettigrew Chronicles. All games Half price. Phone: Worcester 352869.

COMMODORE 64 for sale with peripherals (disk drive and MPS 801 printer 50cps) and software (word processing, accounts, games) and very useful documentation. Will sell the lot or part. Phone 01-654 0808.

VIC 20 Starter Pack + into Part 2 + 16K switchable RAM pack + 20 games. worth £335 Sell for £150 Tel 01-597 7106.

VIC 20 + cassette deck + 16K + Super Expander + joystick + 19 inch b/w TV + programmers reference guide + manuals + magazines, fully boxed. Worth £350 + £160 of software. Accept £170 ono. May split. Tel: Mansfield 792911.

VIC 20 Starter Pack, over £160 worth of original software, Quickshot joystick Mark two, Introduction to Basic programming I & 2, manuals, books, worth over £300. Sell £120 Tel: Coventry (0203) 360 950.

VIC 20 C2N, 16K switchable RAM pack, Intro to Basic I, Quickshot 2, lots games and mags. £130. Ask for Paul SOS 0702 540452.

CBM 64 Cassette, £30 of games. Joystick £180 ono. Tel: 01-743 3619.

DBN 64 for sale + 25 games (all original) + guide for playing Hobbit, APX, £160 with manuals + leads. Kipit 6-9pm Tel: 01-455 3185.

7 BLANK disks, C64 + manual. Offers. Tel: 01-455 3185

For Sale

FOR SALE Currah micro speech for the zx Spectrum vgc. £20 ovno with free game. P.Gower, 4 Clyfford Crescent, Newport, Gwent.

ORIC 1 software for sale. Wimpley, M.A.R.C., Scuba, zorlons. 3D Battle, £2.50 each. Hobbit, £3.50. Lords of Time, £3.50. All for £18.00. Originals. Southampton (0703) 847168.

SHARP MZ80A As new 48k integral cassette and monitor. Games utilities and books £300. Any offer considered. Tel: Worthing (0903) 690370 after 6pm. Weekdays any time, weekends.

IDEAL Christmas Gift. Oric 1, 48, tape recorder, programmable joystick interface. Quickshot, 5 Oric owner mags, 6 books and over 25 games. Optional extra B/W TV. Costs over £320. Sell only £115 (TV) £25. Tel: 0243 787292.

2 ZX Microdrives £70. 8 microdrive cartridges £20. Unwanted gifts, brand new Amstrad MP1 £22. As new. Tel: 0696 822 744 (Blantyre).

ORIC 1 48K, tape recorder, 2 manuals, mags, all leads, £73 worth software, under guarantee. Excellent condition. As new, £95 ono. Tel: Leicester 766802 after 6.00am. Ask for Paul.

DMP 100 printer, 80 columns, hi-res graphics, Centronics RS232 interface (ideal for Interface 1), including RS232 cord + screen dump software + 100 sheets paper. Mint condition. New £300. sell £125 ono. Tel: 0272 684615.

TRS-80 model 100 24K Ram, including program recorder, 2 months old £450. Also video games system with unique built-in screen including 2 games £35. Tel: Brighton 695351.

SHARP MZ 700 64K Colour built-in printer, built-in tape recorder + manual + s/w £250. Tel: 303 501 (Notts).

EPSON HX20 + micro cassettes £300 ono. Tel: Erdiston 384 (Worcs.).

48K Oric good condition £70 ono. Tel: Jason Miller, Newmarket 750439

CASIOTONE MT70 electronic keyboard as new. Complete with bar-code reader and original packing. Offers around £120. Tel: 01-458 3995 after 6pm.

MICROS Peripherals CGP 115, 4 colour graphics printer/plotter, excellent condition, still boxed, only £550. Tel: 0344-886178 eves.

Wanted

WANTED SPECTRUM version 30 Hour Basic. Tape and/or book. Also other Learn Basic of machine code tapes. 79, Beaconsfield Rd, London N15 4SH. Phone: 01-800 6767 after 7pm.

SWAP my Vic-20 20K plus lots of software and loads of magazines for your CBM64. Software would be much appreciated but unnecessary. Ring Reigate 22136 after 5.00pm. for details.

WANTED ADVENTURE programs, assemblers and disassemblers for TRS 80 MIL II, good prices paid — contact Martin Ward, High Larches, Shire Lane, Farnborough, Kent BR6 7HH

WANTED White Lightning Swap for Hurd. Bournemouth 737532 after 5pm.

WANTED MICRODRIVES and interface 1. Will pay half recommended price. Would pay more for 2x Expansion system. Tel: 01-785 9332

SWAP ORIC-1 48K for byte drive 500 or sell for £89 ono. with original packaging. (Owner has Atmos) tel: (048 67) Brookwood 3702 Surrey evenings/weekends.

WANTED any version QL, swap for Oric Atmos. Dragon 32, Acorn, Atom, accessories for all, joysticks, books etc. Good condition. Value £500+. Also recorder. Tel: Crynant, 750952 and ask for Andrew.

WANTED SPECTRUM 48K. Working order up to £70 paid also peripherals considered. Phone: (051-424 5558 Daytime.

SWAP C64 — CM2 Cassette, all boxed, 4 year guarantee plus £100 of software for BBC + cassette. Will pay extra for disc. Tel Swindon 36570.

WANTED BBC B in exchange for 1, 48K Spectrum + Kayde Electronics Full size keyboard bar + printer. BBC type sound chip, thick stick joystick, £80 of s/w. Tel: 682 653 (Pool).

PENPAL or tape pal wanted with 16K or 48K Spectrum age not important but prefer adult male or female to exchange ideas progs, etc. I am beginner and require help. 041-762 0105.

SWAP SHARP PC1500 with printer, cassette interface software and tape recorder for music centre or stack unit. Tel: 0493 781958

YOUR LERM (MD1) microdrive transfer tape (original with manual & examples) swap for one of my unused microdrive cartridges. Please ring Paul on Suckley (08864) 588 (Worcestershire).

WANTED: First copy of Crash Magazine: name your price and ring 01-348 3924. Ask for Graham.

WANTED ZX-48K Spectrum Plus real keyboard £100 cash plus P+P or £75 and £25 separate. No software. Write to address below: V. Elstrations, 48 Evagelistrina St. 17971 Kallithea, Athens, Greece.

WANTED ROM cartridges for Sinclair, Spectrum (chess, Jet-Pac etc) write first with price please, Mr J.F.C. Sellick, Garden Flat, 10 Cotham Gardens, Redland, Bristol BS6 6HD.

EXCHANGE Spectrum 48K Plus microdrive plus interface 1 plus s/w and manuals for Tandy TRS-80 model 1 or 3 48K plus VDU. Write C.R. Hutersall, Handling Flight, RAF Linton-on-Ouse, Yorks YO6 2AJ.

WANTED ZX printer to swap for Ant Attack, Morris Meets the Bikers, 3D Tanx, Micro Mouse, Sinclair Games 4 originals. Tel: (0287) 32561 (after 4pm on weekdays)

WANTED any Spectrum or CMB in working condition, for £20, for unemployed disabled, spare printer. Please quote price, unwanted games, as well Sony, 41 Lowestoft Rd, Gorleston, Norfolk, NR31 6LZ.

ADVENTURE HELPLINE

Hobbit on Commodore 64. How do I get past the magic door in the Elvenkings halls? If there is a key, where is it? Robert Morris, c/o EO685892 F/S Morris, Sgts Mess, RAF Gatow, BFPO 45.

Twin Kingdom Valley on Commodore 64. I can't get the master key off the dragon because he burns me to death. Simon Hegarty, 15 Highfields, Hoylandswaine, Sheffield.

The Quest on Commodore 64. How to get out through the window in the observatory? HB Wishart, 'The Pear Tree', Sunderland Road, Kelling, Tyne and Wear, NE3 3LR.

Dallas Quest on Commodore 64. How do I go down the ladder in the trading post? P A Taylor, 167 Uplands Road, West Moors, Wimborne, Dorset.

Labyrinth on TRS80. I cannot get past the bear, man or gnome! Chris Enright, 364 Poynters Road, Luton, Beds LU4 0TW.

Urban Upstart on Spectrum. How do you fly the plane? I need help desperately. Mark Allan, 20 Holmergreen Road, Hazlemere, High Wycombe, Bucks, HP2 7BL (Tel 716884).

Classic Adventure on Spectrum. I can only score 140 but I can't find any more locations. John Bladon, 15 Benson Avenue, Goldthorn Park, Wolverhampton, W Midlands.

Gateway to the Skyes on BBC. In part 1: how do I get the packaxe and how do I get the bones for the dog? Eric Tiziani, 51 Firwood Drive, Camberley, Surrey GU15 3QD.

Fantasia Diamond on Spectrum. I can't manage to cross the river. What does 'wait for it' mean? Darren Parkinson, 45 Dryden Avenue, Bryn, nr Wigan, Lancs.

Castle of Riddles on BBC. I have found 11 treasures but I cannot take the ring without being killed. How do I get the ring? Jan Wiffill, 18 Auckland Road, Ford, Plymouth, Devon PL2 3BX.

Pyramid of Doom on BBC. Where is the tiny door? How do you get inside the pyramid? David Yick, 5 Ryburn Buildings, Sowerby Bridge, nr Halifax, West Yorks HX6 3AH.

Magic Mountain on Spectrum. I can't get through the maze. Could someone give me directions please. Katy Proctor, 23 Linnell Road, Rugby, Warwickshire.

Hobbit on Spectrum. What do I do after opening the window in the goblin's dungeon? D A Hollis, 3 Aldbourne Road, Burnham, Bucks SL1 7NJ.

The Count on Vic20. How do I get into the vents? What do I do when I find the coffin? How do I find the crypt? Andrew Kingman, 6 Falldownfield, Leighton Buzzard, Beds LU7 8PW

Vic 20

- 1 (10) Perils of Willy (Software Projects)
- 2 (2) Duck Shoot (Mastertronic)
- 3 (—) Punchy (Mr Micro)
- 4 (—) 3D Maze (Mastertronic)
- 5 (5) Sub Commander (Thorn EMI)
- 6 (8) Snooker (Visions)
- 7 (3) Computer War (Thorn EMI)
- 8 (4) Max (Anirog)
- 9 (9) Space Scramble (Mastertronic)
- 10 (—) Flight 015 (Craig Communications)

(Figures supplied by Boots/Websters)

Commodore 64

- 1 (—) Ghostbusters (Activision)
- 2 Raid over Moscow (US Gold)
- 3 Chiller (Mastertronic)
- 4 PSI Warrior (Beyond)
- 5 D. Thomsons Decathlon (Ocean)
- 6 International Soccer (CBM)
- 7 Falcon Patrol II (Virgin)
- 8 Zaxxon (Centrossoft)
- 9 Jet Set Willy (Software Projects)
- 10 BMX Racers (Mastertronic)

(Two titles tie for 10th position)
(Figures supplied by Boots/Websters)

Spectrum

- 1 (—) Knight Lore (Ultimate)
- 2 (—) Pole Position (Atari)
- 3 (1) Daley Thomsons Decathlon (Ocean)
- 4 (2) Beach Head (Centrossoft)
- 5 (8) Tornado Low Level (Vortex)
- 6 (—) Backpackers Guide to Universe (Fantasy)
- 7 (—) Rhymes of Zandos (Dorcas)
- 8 (—) Strange Loop (Virgin)
- 9 (—) Full Throttle (Micromega)
- 10 (—) Jet Set Willy (Software Projects)

(Figures supplied by Boots/Websters)

Dragon 32

- 1 (1) Hunchback (Ocean)
- 2 (2) Hungry Horace (Melbourne House)
- 3 (8) Dragon Chess (Oasis Software)
- 4 (3) Mystery of Java Star (Shards)
- 5 (4) Chuckie Egg (A&F)
- 6 (6) Mr Dig (Microdeal)
- 7 Cuthbert in Space (Microdeal)
- 8 (7) Kriegspiel (Beyond)
- 9 (10) Bug Driver (Mastertronic)
- 10 (—) Sprite Magic (Knight Software)

(Figures supplied by Boots/Websters)

BBC

- 1 Scrabble (Leisure Genius)
- 2 Elite (Acorn)
- 3 Football Manager (Addictive)
- 4 Swag (Micro Power)
- 5 Mini Office (Database)
- 6 Mr EE (Micro Power)
- 7 Pearl Harbour (M/Game Simulations)
- 8 Elite (Disc) (Acorn)
- 9 Challenger (Mastertronic)
- 10 Return to Eden (Level 9)

(Figures supplied by Boots/Websters)

Atari

- 1 (9) Encounter (Hi-Tech)
- 2 (1) Attack of Mutant Camels (Llanasoft)
- 3 (3) Zaxxon (Centrossoft)
- 4 (8) Gridrunner (Llanasoft)
- 5 (10) Slinky (Centrossoft)
- 6 (6) Carnival Massacre (Atari)
- 7 (2) Computer War (Atari)
- 8 (5) Tank Commander (Thorn EMI)
- 9 (7) Leggit (Imagine)
- 10 (4) Sub Commander (Thorn EMI)

(Figures supplied by Boots/Websters)

Amstrad

- 1 (1) Harrier Attack (Durrell)
- 2 (—) Ghoul (Micropower)
- 3 (—) Word Processor (Amstrad)
- 4 (5) Star Commando (Terminal)
- 5 (—) Forest of Worlds End (Interceptor)
- 6 (2) Code Name Matt (Micromega)
- 7 (—) Return to Eden (Level 9)
- 8 (4) Roland in the Cave (Amsoft)
- 9 (—) Monster Chase (Romik)
- 10 (3) Chess (Amsoft)

(Figures supplied by Boots/Websters)

Readers' Chart No 1

- | | | |
|----|---|----------------|
| 1 | Daley Thomson's Decathlon (Spectrum/C64) | Ocean |
| 2 | Danger Mouse in Double Trouble (Spectrum/C64) | Creative Parks |
| 3 | Elite (BBC/Electron) | Acornsoft |
| 4 | Underwulde (Spectrum) | Ultimate |
| 5 | Pyjamarama (Spectrum/C64/Amstrad) | Micro-Gen |
| 6 | Beachhead (C64) | US Gold |
| 7 | Tir Na Nog (Spectrum) | Gargoyle |
| 8 | Deus ex Machina (Spectrum) | Automata |
| 9 | Eureka (Spectrum/C64) | Domark |
| 10 | Lords of Midnight (Spectrum/C64) | Beyond |

Week 1: No winner — £50 added to Week 3 chart fund

Now voting on Week 3

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 ten names of your current three favourite software titles (or copy the form onto 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 3 closes at 2pm on Wednesday December 5. Entries received after that time will not be eligible for inclusion in that week's voting.

Name.....	My top 3: Voting Week 3
Address	1.....
.....	2.....
.....	3.....

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	Now 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	NEC 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 26 11.00am-5.00pm	Barbican London EC2	Free in advance from organisers	Computer Marketplace 01-930 1612

New Releases

MAGIC STONE

Along with some cassette versions of previously disc-based games like *Alice in Videoland*, Audiogenic have released *Magic Stone*, an adventure with, it says, 'graphics, sprites, music and sound'.

The aim of the adventure is to find a magic stone — secret key to alchemy — and a book of experimental notes by Von Schwarzerzen which tells you what to do with it. Aiding you is a mystic amulet which turns different colours when magic is around.

The graphics are fairly simple and occupy only about a sixth of the screen; nevertheless, the idea of graphics that change according to your choices is definitely one of the directions we are moving in. Of the quality of the adventure as an adventure I can say little except that I got stuck after about seven moves and it only understands a fairly simple vocabulary.

Still, I suspect it could get pretty addictive and it is a little different from the norm.

Program *Magic Stone*
Price £5.95
Micro Commodore 64
Supplier Audiogenic, 39 Suttons Industrial Park, London Park, Reading, Berkshire RG6 1AZ

DISASTER

Havoc on the Commodore was one of the best programs released recently for the machine.

Now the program has been issued for the Spectrum and it is a massively inferior game.

The smooth 'diagonal' scroll of the CBM version has become a jumpy, jerking mess and in only two colours.

The game is also easier to play than the Commodore version which would be an advantage, perhaps, had one any inclination to play it. But the whole thing is such a disaster I'm surprised Dynavision bothered to release it — especially given the reputation it had built with the original. One last point, the packaging uses photos from the CBM version — OK, this fact is pointed out, but it's still highly misleading to anyone taking a quick glance. Avoid completely.

Program *Havoc*
Price £7.95
Micro Spectrum
Supplier Dynavision Producing Studio
PO Box 96
Luton
LU3 2JP

STREETWISE

What could be more streetwise, outdoorsy, energetic and physical than breakdancing? — the very antithesis of all things computeresque you might think but no — now you can breakdance on the computer. This does not mean dancing about on top of it and smashing it to bits. *Breakdance* is a computer program for the Commodore 64.

Actually for the most part what you get are various games



based around dancing, although one option is to create your own dance. Inevitably much of the program involves the Commodore 64 making scratch record impersonations, quite funky really, and only spoilt by my having heard the *Ghostbusters* music on the same machine which easily outclasses it.

The little figures boogie quite neatly and games include a *Simon* variant in which you have to match the movements of a dance, another has you trying to perform backspin and suicide moves. I'd have thought that breakdancers wouldn't want to play a computer game and vice versa.

Program *Breakdance*
Price £18.95
Micro Commodore 64
Supplier CBS
Ashbrook House
3-5 Rathbone Place
London W1

ANCIENT ART

Ghoulies is a Quilled (bets — I didn't actually find a reference though) adventure with many excellent touches not least

being the way the text is enlivened with small illustrations, large capitals, etc, like some ancient manuscript.

Ghoulies is actually a pretty gloomy and gothic adventure — one of the first things you'll discover is a corpse swinging on a gibbet. The plot concerns ancient arts, alchemy, secret documents and dead sinners.

What I like about the program is that though it has all the usual adventure touches of magic, clues, secrets, and ancient mysteries, its atmosphere is quite different from the norm. The gothic touches and horrible scenes give the adventure a dark hue like something by Bosch. X rated horror for hard core adventurers. A little gem.

Program *Ghoulies*
Price £5.00
Micro Spectrum
Supplier IMS Software, 143-145 Uxbridge Road, London W13 9AV



This Week

Program	Type	Micro	Price	Supplier
Frogger 2	Arc	Atari	£9.95	Silica
Gyruss	Arc	Atari	£9.95	Silica
Star Wars	Arc	Atari	£9.95	Silica
Marine Wars	S	Atari	£6.95	Silica
Pooyan	S	Atari	£9.95	Silica
Strategy X	S	Atari	£6.95	Silica
Pole Position	Arc	BBC	£9.99	Atari
Robotron	Arc	BBC	£9.99	Atari
Hektik	Arc	Commodore 64	£1.99	Mastertronic
Jungle Story	Arc	Commodore 64	£1.99	Mastertronic
Mutant Monty	Arc	Commodore 64	£6.95	Artic

Quinx	Arc	Commodore 64	£6.95	Supersoft
Spectipede	Arc	Commodore 64	£1.99	Mastertronic
Squirm	Arc	Commodore 64	£1.99	Mastertronic
Starace	Arc	Commodore 64	£1.99	Mastertronic
Alien	S	Commodore 64	£6.99	ASP
The Pencil	Ut	Commodore 64	£11.99	Activision
Tutor	Ed	QL	£20	Snowsoft
M/C Sprite Designer	Ut	QL	£15	Snowsoft
Se-Kaa of Assiah	Ad	Spectrum	£2.99	Mastertronic
The Witch's Cauldron	Ad	Spectrum	£6.95	Mikro-Gen
Doomdark's Revenge	Ad	Spectrum	£9.95	Beyond

STOCK LEVEL

There are several big problems with using your Spectrum for serious business purposes, but one way or another all can be overcome. Problems like keyboard and slowness of tape can be surpassed by buying an add-on and micro drives. Centronics interfaces can be purchased for print outs. The problem is there are few business programs that support micro drives (though the number are growing) let alone drive the various different Centronics interfaces.

+80 Stock Manager not only drives nearly any interface you can think of, it outputs in 80 columns — just like 'real' programs and supports micro-drives.

About **Stock Manager** programs in general there isn't much to say — you can keep a record of all products stocked and view increases and decreases, minimum stock levels,

produce invoices with appropriate Vat codes, etc. A small, but well written manual explains the basic functions and how to customise the program for your own particular interface, etc. The results are printed out in 80 columns and look most impressive. A useful program.

Program +80 Stock Manager
Price £19.95
Micro Spectrum
Supplier Oxford Computer Publishing Brimrod 4a High Street, Chalfont St Peter, Buckinghamshire SL9 9QB

SECRET RUNE

Sometime last year, around a month or so before *Valhalla* was finally issued, Dorcas issued a program called *Oracles Cave* which featured an animated man who walked around, climbed ropes, fought baddies and hunted for treasures, in some ways the first animated graphics adventure.

Dorcas has now released a sequel to *Oracles Cave* entitled *The Runes of Zendos* which features the same general layout and a similar, although smaller, character.

The plot is complex and has been deliberately designed to function on different levels — on one it is a bash it out dungeons and dragons variant, on another it has a text adventure in which amongst other things you try to discover the meaning of various secret runes.

Here's the plot. The year has

Pick of the week

Grown men weep for joy, children wave flags, white doves and coloured balloons are flung into the air. *Doomdark's Revenge* has arrived. To describe *Doomdark* as long awaited is actually to make a mistake, not about enthusiasm but rather about time. All things considered, this is a sequel that has followed reasonably closely the original triumph of *Lords of Midnight*. At least when you contrast it with the year or more between, say, *Jet Set Willy* and *Manic Miner* or *Great Space Race* and *Valhalla*.

The basic look of *Doomdark* is the same as *Lords of Midnight*, but in many ways there is a different 'feel' to the game which makes playing the game a new and different experience. Apart from anything else, *Doomdark* is a more sophisticated and more difficult game.

A number of extra commands and features have been added to the game. *Check Place* gives information about the current location, *Check Battle* tells you how a battle went, *Check Army* tells you how many men you command. A new feature is mist which moves across the

GOODIES AND BADDIES

landscape and makes the going difficult — location pictures actually change over time as the mist moves. Mike Singleton has also produced the effect of three colours out of two by using thin lines alternating the two main colours — this



cunning effect can, for example, produce a kind of orange from yellow and red.

Doomdark is set in the icy waters to the north of the land of midnight. Morkin, affable hero, has been captured by the evil Shareth the heartstealer — a sort of cosmic Joan Collins. Morkin's true love, Tarithel the Fey, no wimp, wanders north in

been trapped — the spirit of each month is hidden in 12 Runic Hour Glasses which are scattered deep within a magical castle. You must find each glass and attempt to decipher the runes around it.

Top half on the screen shows

the action — the little man who walks, runs, fights and climbs. The bottom is for you to input your sentence and for other information. There are a lot of options within the game including saving to microdrive. The 12 glasses from 12 connected,



This Week

Galaxian	Arc	Spectrum	£7.99	Atari	Ed	Spectrum	£7.95	Sinclair
Ms Pac Man	Arc	Spectrum	£7.99	Atari	Ed	Spectrum	Ed	Sinclair
Pole Position	Arc	Spectrum	£7.99	Atari	Ed	Spectrum	£7.95	Sinclair
Bodywop	Ed	Spectrum	£7.95	Sinclair	Ed	Spectrum	£7.95	Sinclair
Disease Dodgers	Ed	Spectrum	£7.95	Sinclair	Ut	Spectrum	£7.45	Eclipse
Estimator Racer	Ed	Spectrum	£4.95	Sinclair	s	Spectrum	£7.95	Ocean
MacMan + Caber Eater	Ed	Spectrum	£7.95	Sinclair	Ed	Spectrum	£7.95	Sinclair
MacMan + Gt Escape	Ed	Spectrum	£7.95	Sinclair	Ad	ZX81	£3.20	Gavin Barker
MacMan's Magic Mirror	Ed	Spectrum	£7.95	Sinclair	S	ZX81	£1.29	R. J. Ratcliffe
Number Painter	Ed	Spectrum	£4.95	Sinclair	S	ZX81	£2.80	Gavin Barker
Oil Strike	Ed	Spectrum	£7.95	Sinclair	S	ZX81	£2.80	Gavin Barker
Planet Patrol	Ed	Spectrum	£7.95	Sinclair	S	ZX81	£2.80	Gavin Barker
Soundabout	Ed	Spectrum	£7.95	Sinclair				
Spellbox	Ed	Spectrum	Ed	Sinclair				
Weathermaster	Ed	Spectrum	£7.95	Sinclair				
Wordsetter	Ed	Spectrum	£7.95	Sinclair				
Stargazer	Ut	Spectrum	£7.45	Eclipse				
Match Day	s	Spectrum	£7.95	Ocean				
Alphabetter	Ed	Spectrum	£7.95	Sinclair				
Adventure	Ad	ZX81	£3.20	Gavin Barker				
Derby Day	S	ZX81	£1.29	R. J. Ratcliffe				
Euro Airways	S	ZX81	£2.80	Gavin Barker				
Racehorse Trainer	S	ZX81	£2.80	Gavin Barker				
Stock Market	S	ZX81	£2.80	Gavin Barker				

search of him on a solitary journey through the mountains. Luxor the Moonprince and Rothron the Wise (a Gandalf clone) supported by a mere 1,000 riders go through the ice gates in a direct assault.

From the computer keyboard, you control the movements of all three characters, Luxor, Rothron and Tarithel, as well as anybody else they've been able to recruit. There are thousands of locations, secret treasures and passage ways and countless goodies and baddies to be met.

Unlike *Midnight*, where there are adventure and strategy quests, here there is only the one way of playing the game—all characters have to move if you are to win and in its totality the game mixes adventure and strategy in about even portions.

The two or three days I've had it is nowhere near enough for deep analysis of the game — that'll follow in the following months — but with its added complexity and detail I think it could prove to be even more gripping than *Midnight*. Don't buy this one at Christmas if you are going to be expected to chat to your relatives.

Program Doomdark's Revenge
Price £9.95
Micro Spectrum
Supplier Beyond, Lector Court,
151 Farringdon Road,
London EC1R 3AD

but separately playable, adventures, and you can switch to other adventures at any time during any game.

Graphically it's fair, but not to be compared with the likes of *Tir Na Nog*; nevertheless it's tremendously playable and

should take ages to solve completely.

Program	<i>The Runes of Zendos</i>
Price	£7.95
Micro	<i>Spectrum</i>
Supplier	<i>Dorcas 3 The Oasis Glenfield Leicester</i>

BREAK-IN

Blogger, one of the best-selling programs on the Commodore 64, has now been translated for the Amstrad. For those who do not know the game it was perhaps the first *Manic Miner* rip-off, although done sufficiently well to become quite a classic in its own right.

Roger the Dodger, a house breaker, has to find his way through a house collecting golden keys. Unavoidably, collecting the keys is no easy matter; some require seemingly impossible leaps, others seem guarded by unavoidable nasties of various sorts.

The blurb for the game describes it as having stereo sound effects. I suppose this means



the wheeeeeeeeee you get when yor little man makes an ill-calculated leap. Amstrad owners aren't as surfeited with *Miner* style games as owners of other machines and this is one of the best. The quality of the conversion from the Commodore 64 is fair, but I suspect we have yet to see what the Amstrad is capable of when pushed to the kind of limits as recent Spectrum games.

Program *Amstrad*
Price *£7.95*
Micro *Amstrad*
Supplier *Alligata, 1 Orange
Street, Sheffield S1 4DW*

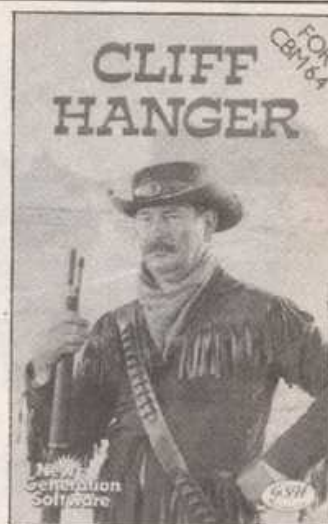
SUBLIME

Cliffhanger is one of the very few games New Generation have produced for the Commodore 64. It's a game you'll either find irritating or sublime, depending on how you feel about roadrunner cartoons.

Personally, I love roadrunner cartoons. The effortless way fate conspires to protect the bird from the efforts of the coyote's ever more devious and Machiavellian plots and the seeming obliviousness of the rather daft looking bird to all that takes place never fails to produce fits of rib-aching mirth.

Cliffhanger replaces the coyote with a silly looking man and the roadrunner with a bandit. There are various screens in all of which the simple objective is to drop a rock on or otherwise blow up the bandit.

In some screens there are seesaws where you drop a



rock on one end and another rock is shot through the air, in others technology is introduced in the form of a giant cannon. In all screens the structure is the same. You stand high on a rocky outcrop above a desert landscape, the bandit comes from the far distance to the front of the screen — you have to time your assault carefully.

The success of the game lies in the small touches — if you accidentally walk off a cliff you plummet to earth out of sight with the authentic pewwwwwwwweeeeeeeeeee-eeeeeeesch sound featured in the cartoons.

You might find the simple plot insufficient to retain your interest. Personally, I can watch it for hours. Good fun for the kids at Christmas, I should think.

Program *Cliffhanger*
Price £7.95
Micro *Commodore 64*
Supplier *New Generation, The
 Brooklands, 15
 Sunnyside, Lymington*

This Week

Addresses

ASP, No 1 Golden Square, London W1R 3AB, 01-437 0626. **Activision**, 15 Harley House, Marylebone Road, London NW1. 01-486 7588 **Artic**, Main Street, Brandesburton, Driffeld YO25 8RL, 0401 43553. **Atari**, Atari House, Railway Terrace, Slough, Berkshire 0753 33344. **Beyond**, Lector Court, 153 Farringdon Road, London EC1R 3AD 01-837 2899. **Eclipse**, 79 Ardrossen Gardens, Worcester Park, Surrey KT4 7AX 01-330 3116. **Gavin Barker**, 12 Fleming Field, Shotton Colliery, County Durham DH6 2JF 0783 261405. **Mastertronic**, Park Lorne, 111 Park Road, London NW8 7JL 01-402 3316. **Mikro-Gen**, 44 The Broadway, Bracknell 0344 427317. **Ocean**, 6 Central Street, Manchester M2

5NS 061-832 6633. **R. J. Ratcliffe**, 40 Merok Park, Belfast BT6 9LT. **Silica**, 1-4 The Mews, Hatherley Road, Sidcup, Kent DA14 4DX. 01-309 1111. **Sinclair**, Stanhope Road, Camberley, Surrey GU15 3PS. 0276 686100. **Snowsoft**, 6 Bousfield Crescent, Newton Aycliffe, Co Durham DL5 5HZ. **Supersoft**, Winchester House, Canning Road, Wealdstone, Harrow, Middlesex HA3 7SJ. 01-861 1166.

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.



BARDIC LOGIC

When Macbeth, the Thane of Cawdor as he then was, went to the Hecate Computer Bureau for the calculation of future projections for his business plan, he seems to have obtained good value on the whole.

Although the event took place many centuries ago Shakespeare, as always, brings out the timeless quality and nature of human experience in his description of the incident.

Thus he tells us of the initial proposal for a demonstration to the client:

'When shall we three meet again?'

And of a problem of decision-making and authority within the organisation, Hecate, who clearly occupies a senior management position, complains of being left out of the presentation — 'How did you dare to trade and traffic with Macbeth... and I... was never called to bear my part or show the glory of our art?'

However, this problem is resolved and Hecate outlines special arrangements for some kind of bonus or commission for the operators: '... I commend your pains, And everyone shall share in the gains'. The presentation then takes place in 'a dark cave' — a venue obviously chosen for its constant ambient temperature of around 10°C, ruling out the necessity for expenditure on temperature control or air conditioning, and as a suitable background for the 3D visual displays that the computer can produce.

The scene then continues rather oddly: Macbeth: 'How now, ye secret, black and midnight hags! What is't you do?' All: 'A deed without a name.'

Nowadays, of course, it is customary to give

computer systems and programs names, to distinguish one from another and to establish ownership and copyright, particularly with a view to licensing or franchising the material. However, the situation we are dealing with here where the program itself is not to be made available to the client; we do in fact hear the names of the modules of the system, such as Toad, Newt and Dragon, when they are being loaded in binary form ('Double, double, toil and trouble...') but these are never mentioned in Macbeth's presence.

This reasoning may may not be altogether correct, however. Macbeth's reference to secrecy may indicate that he has been made to sign some kind of confidentiality agreement, indicating possible access to the source software. There could hardly be any objection to his reporting the impressive, not to say spectacular, nature of the output from the system to other potential clients. In particular the 3D graphics produced (holography?) indicate a technology to some extent in advance even of the present-day state of the art.

Macbeth is given the choice of having a report from the operators or interrogating the computer himself — 'Say, if thou'dst rather hear it from our mouths, or from our masters?') He chooses the second alternative and this reveals that the system is not only interactive but accepts input by telepathy — Macbeth starts to ask a verbal question but is interrupted by one of the operators who tells him 'He knows thy thought — Hear his speech, but say thou naught'. This confirms again the high level of sophistication reached by ancient computer technology.

In the final scene of the play, Macbeth, King of Scotland as he then (predictably) was, complains that he has been misled by the output; he expresses a certain dissatisfaction with the service provided, deriving in particular, it seems, from the comments about 'Birnam Wood' and 'man of woman born'.

'I begin' he says 'to doubt the equivocation of the fiend that lies like truth', and '... be these juggling fiends no more believed... that keep the word of promise to our ear, and break it to our hope.'

However, it is easy enough to blame the computer when things go wrong, and if Macbeth chooses to interpret the output provided without reference to his own general knowledge about forestry and Cæsaarian section, it is probably because that is how he wants to interpret it.

Gwyn Mellish

Getting in training

Puzzle No 135

Eric has just spent a day sightseeing in London. His return rail fare cost him just one fifth of the money he had, and then he spent an extra 60 pence on newspapers to read on the train.

On arriving, he bought lunch which cost him a quarter of what he then had, before a quick tour of the sights costing just three pounds in fares.

Before leaving for home, he spent a third of what remained on souvenirs, and a further seventy pence on sandwiches for the journey back.

Whilst on the train he noticed that he had as many pounds as he originally had pence, and as many pence as he originally had pounds. Also no transaction involved half-pennies.

How much did he set out with?

Solution to Puzzle No 13.

- i) $7 * (7 * 3 * 5) = 735$
 ii) $8 * (1 * 2 * 8) = 128$ or $5 * (1 * 7 * 5) = 175$ or $4 * (3 * 8 * 4) = 384$

The program assigns values to P,C and W and checks to see if the expression equalises. In the program given, the first of the two alphametics is being checked. To solve the second, amend Line 40 to: **40 T = W * (P * C * W).**

10 FOR P = 1 TO 9 20 FOR C = 1 TO 9 30 FOR W = 1 TO 9 40 LET T = P * (P * C * W) 50 IF T = P * 100 + C * 10 + W THEN PRINT P;C;W 60 NEXT W 70 NEXT C 80 NEXT P

NB Clearly, none of the values of P,C, or W can equal zero.

Winner of Puzzle No 130

The winner is D Titley of Park Lane, Cottingham, N Humberside, HU16 5RX, who receives £10 pounds.

Rules

If the puzzle can be sensibly solved using a computer, then the winner have included a listing of the program used to find the correct answer. The closing date for Puzzle 135 is December 14.

The Hackers



**HOT
FROM**

SEGA

THE ARCADE WINNERS

released
NOW

TAPPER

**SIDE-SPLITTING, SODA-SLINGING
LAUGHS AND SPILLS!**

THE OFFICIAL HOME VERSION OF
BALLY MIDWAY'S ARCADE HIT

Belly-busting Soda Fountain Fun, including:

- Mad-capped, soda-starved, clammering cowboys, sports fans, punks and space creatures

- Plus a head-spinning Soda Bandit Bonus Round
- Awesome color-packed action graphics
- Just try to keep your cool as hot-headed, crazy customers blitz your bar for another cold one.

U.S. Gold is stocked by



John Menzies | WILDINGS

WOOLWORTH, WHSMITH,

Rumbelows

and Spectrum Shops

Bally/MIDWAY
TAPPER
OFFICIAL ARCADE GAME

NEW!

Bally/MIDWAY
Up'n Down
OFFICIAL SEGA ARCADE

NEW!

BUCK ROGERS
OFFICIAL SEGA ARCADE

OFFICIAL SEGA ARCADE

OFFICIAL SEGA ARCADE GAME

Bally/MIDWAY
SPY HUNTER
OFFICIAL SEGA ARCADE

NEW!

4
COMMODORE
CASSETTE
9.95
DISK
12.95

SPECTRUM
CASSETTE
7.95



Exclusive manufacturers for
SEGA and Bally MIDWAY

For release schedule and trade details contact:
Centre Soft, Unit 10, The Parkway Industrial Centre, Heneage Street, Birmingham B7 4LY. Telephone: 021-359 3020. Telex: 337268.

LADY CLAIR HAS HAD A VISIT FROM A SINGING GORILLA, AND AUTOMATA UK LTD HAVE HAD A VISIT FROM THE VATMAN. THEY MUST RETURN TO PILAND TO SORT IT ALL OUT. CLAIR IS EATING SOME VERY FUNNY THINGS INDEED.

Greenish Evans
HSSKAUCHUAFAUCH.
HSSRAA-VA-UAH-UAEUAUH
PILAND'S STARTER MOTOR NOISES

OH, COME ON, MORRIS. I THOUGHT YOU SAID YOU FIXED HIM, PIMAN!

LOOKS LIKE HE DID! FOR KEPS!

SHUTUP! SHUTUP SHUT SHUT UP!

IT'S NO GOOD! I CAN'T MAKE HIM GO!

TRIED PUTTING ALL-BRAN IN THE TANK?

VERY FUNY! LOOK, WE'LL HAVE TO HAVE SOME TRANSPORT... FOR CLAIR, YOU SEE...

CAN YOU MANAGE TO LIFT THAT HEAVY PHONE? DON'T BE SARKY, YOU... OH, YAKZEE YAK? HI! LISTEN, WE NEED HELP...

I WASN'T BEING SARCASTIC, CLAIR... YOU MUST BE VERY CAREFUL WITH A LITTLE TAX EXEMPTION ARRIVING.

OH ALL RIGHT

SHUFFLE OFF, YOU LOT - I DON'T SEE WHY YOU ALL HAVE TO TAG ALONG! IT'S MY FLIPPIN' TAX EXEMPTION!

AYE, WELL, WE'LL SEE ABOUT THAT! FANKY A NICE KNOB O' COAL, LASS?

HARRO! I COME TO OFFER MY UNWORTHY BACK TO MAKE RADY CRAIR'S JOURNEY TO PILAND MORE COMFORTABLE!

GREAT!

HA! ARSO BLING AUTOMATA'S GAME OF RUCK & SKIRK. "YAKZEE" TO ARAY ON JOURNEY!

GOODO! HELP US UP, CROUCHER - I'LL UNZIP THIS INTERDIMENSIONAL FLY-OVER!

WHEEEE! SUCH EXPRESSIVE USE OF COLOUR FROM OLD EVANS TODAY!

AND SO THEY BEGIN THEIR JOURNEY ACROSS THE DESERT OF LOST IDEAS, TO THE GATES OF PILAND.

OH AH COOM FRAM TRIMPIDAD WID MAH SHTEREOGRAM ON ME ARM IT'SH POWERED BA DE DYNAMO IN MAH LEFT SHIKATE COSH DE BATTERIES AN DOWN ON DE FARM!

It really gets worse every week! How can I punish my little girl for eating crayons and coal when Lady Clair is depicted doing so on your page? Yaws, Veronica Angriellie.

Dear Very, We know your "little girl" happens to be 34! Isn't it time she was witched? Automata.

OW'S DEUS EX MACHINA DOIN', CROUCHER?

OH! GREAT, THANKS - HAD LOADS OF COVERAGE ON BBC1'S 'SATURDAY SUPERSTORE' AND 'THE CHIP SHOP ON RADIOS 1 AND 4...

AND THE LBC BREAKFAST AT ALLY PALLY THE OTHER WEEK - AND AN ARTICLE IN THE SUNDAY TIMES COLOUR SUPPLEMENT THIS WEEKEND!

ONE MAG DID GIVE IT A BIT OF A GROTTY REVIEW... 'CLOCK MENDERS MONTHLY' OR SOMETHING...

How's 'PIMAN'S GREATEST HITS TOO' DOING? VERY NICE, IN FACT, HERE COMES AN ADVERT!

PIMAN'S GREATEST HITS TOO
THE BEST STEREO MUSICAL EXTRAVAGANZA WE HAVE EVER PRODUCED SINCE CLOSING TIME! - ONLY £3 - OR £4 WITH THE PIMAN'S 1985 CALENDAR
ALL DOUGH AND ORDERS TO:
AUTOMATA U.K. LTD
27 HIGHLAND ROAD
SOUTHSEA, HANTS PO4 9DA
TEL: (0705) 735242.
DON'T BE LEFT OUT!

THA FACE IS COVERED IN COAL DOOST, LASS!

NO, I'VE BEEN EATING A MA'S BAR - IT MUST BE CHOCOLATE!

HEE HEE! THAT MAKES YOU A CHOCOLATEY CLAIR!

LOOK YOU GUYS! THE GATE OF PI!

WOW! IT'S AWESOME! IT BLITZES MY EYES! IT REFRESHES MY SENSE OF PURPOSE IN LIFE!

IT'S BEAUTIFUL! IT'S ETERNAL... IT'S...

...IT'S HALF SIX! WE'VE MISSED STAR TREK!

OH, POO!!