

# Home Computing WEEKLY

An Argus Specialist Publication

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No. 45  
Jan 17-23, 1984

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New micros from Sinclair and Oric.  
All the details, plus pictures

## Digger v. the aliens

Programmer Jonathan Griffiths got behind the wheel of a 7½-ton excavator — to help write a computer game.

The result is a tape called JCB Digger, due out for the BBC model B micro within six weeks from Acornsoft.

Players see an aerial view of a digger — in JCB yellow with black tyres, red wheel hubs and white scoop. The aim is to dig a hole with the scoop and entice, or wait for, an alien to fall in and then use the bucket to re-fill the hole.

Talks between J. C. Bamforth, the Staffordshire-based makers, and Acornsoft began a year ago. Mr Griffiths, 21, spent two

Continued on page 6

## TED arrives in spring

Commodore is to launch a new home computer here in April. Codenamed TED, it will be marketed as the Commodore 364 at a US price of \$500.

Although the final design for the UK has not been decided, it will have a brand new BASIC.

This means that Commodore is breaking with its usual policy of ensuring that new computers are compatible with earlier models.

The new language is called BASIC 4-plus and is an enhanced version of the BASIC used on the company's business machines.

Commodore's UK marketing

Continued on page 6

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## Briefly

Acorn has brought out a dual format disc system allowing floppy discs to be read by both 40 and 80 track drives. All Acornsoft's new disc-based titles will be in the dual format, and titles being sold on standard discs now will be made available in dual format versions later this year. Dual format discs will cost the same as the single format discs they replace.

Acornsoft, 4a Market Hill,  
Cambridge CB2 3NJ

AVF have launched a new computer workstation called Program 1. It's a teak-effect desk with a VDU support that also provides space for disk drives. The VDU can be placed on the left or right hand of the desk top and in two positions from the front edge. The unit comes packed flat for self-assembly.  
Price: £45

AVF, Dixon Street, Wolverhampton

VIC-20 specialists Sumlock are now moving into Commodore 64 software with Gridtrap 64, Lumpin Jack 64 and Triad 64, all retailing at £8.95. Gridtrap comes with an entry form for the live Wire High Score Competition. First prize is a Commodore 1541 disc drive, second prize a Commodore 1520 colour printer plotter, third prize a Simons BASIC package and seven runners-up win Pro-Ace competition joysticks.

Sumlock, Royal London House,  
198 Deansgate, Manchester M2 3NE

Alan Firminger has reduced the price of his All-Sort program, which gives machine code sorts for use in BASIC on a Spectrum, to £9.95. This, Alan says, is because he didn't have to supply as much after-sales service as he had expected for the first copies sold.  
Alan Firminger, 171 Herne Hill,  
London SE24 9LR

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I'm An  
**URBAN  
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RICHARD SHEPHERD SOFTWARE

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ZX Spectrum

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There's eight pages of software reviews in this issue — that's 40 programs rated by our panel, more than any other magazine

**Vortex**  
SOFTWARE

Turn to the competition on page 9. There's 200 chances to win a share of £1,000-worth of games from Vortex Software



We begin a major series on page 21 which will give you Extended BASIC on your Commodore 64. Type in this week's listings and use them straight away. And make sure you get the next two issues

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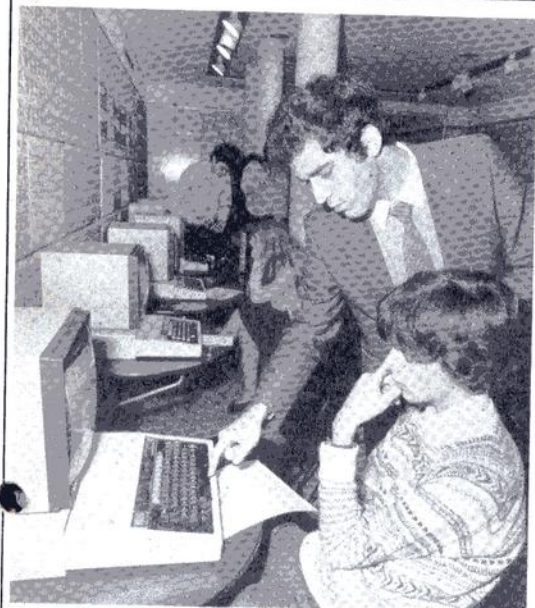
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## Footsore, but winning

Having won the Acorn Computer World Chess Championship semi-finals, Gary Kasparov — the young Russian tipped as the next world champion — is seen at

Acorn's London showroom taking on 10 junior chess players simultaneously. Rather than using traditional chess boards, the games were run on BBC micros with Acornsoft chess programs. After playing on his feet for six hours, Kasparov won 6-4.

## New micro: 'free' monitor

Every CPC 64 home micro from Amstrad will include a 12-inch green screen monitor and built-in cassette player for about £200 11-in.

Amstrad, best-known for hi-fi equipment, plans an April launch. Using a Z80A processor running at 4MHz, the computer will have 64K of RAM and typewriter-style keyboard with numeric keypad plus five separate cursor control keys.

Screen resolution will be 320 by 200 graphics and 80 columns by 25 rows text and offer 24 colours. There will be three-channel, seven octave sound and a Centronics interface.

Elkan Electronics has now brought out quick reference cards for the VIC-20 and the Commodore 64. The cards are intended for use as easier-to-use versions of the reference manual, and are small enough to fit in your pocket. They cost £3.95 each.

Elkan Electronics, 11 Bury New Road, Prestwich, Manchester M25 8JZ

Clearly aimed at the Commodore 64, its specially written BASIC is similar to the industry standard with additional commands.

Amstrad plans to have 50 software packages available at launch.

The director of computing for Hertz Europe, Jonathan Chaple, has written a £4.95 book designed to give a simple introduction to Sinclair computers, starting with plugging in and switching on. It is called *I Wish I Knew...* About the Spectrum and the ZX81 and is published by Pitman.

Pitman Books, 128 Long Acre, London WC2E 9AN

□ □ □

Audiogenic has announced a home database system for the 48K Spectrum called Data Genie. The system is said to let you organise records and retrieve them in the way you want, using "pop-up" menus controlled by three keys. The system will hold up to 146 records each with 15 lines of data, and costs £9.95.

Audiogenic, PO Box 88, Reading

## Row over cut-price 64s

Fair trading officers are looking into a complaint that Commodore refused to supply a cut-price shop.

Commodore 64s are on sale in London's Regent Street at £15 less than other retailers.

Michale Mehdi, 28, managing director of Crestmatt, said he had been told to increase the price to the usual £199.95 — and that he had tapes of phone conversations and witnesses to prove it.

He had received no reply to letters in November and last month requesting £10,000-worth of stock from Commodore. If necessary he would take his complaint to the European Court.

Now the Office of Fair Trading has confirmed that it has received the complaint. A spokesman said it was illegal under the 1976 Resale Prices Act to refuse supply over pricing.

John Baxter, Commodore's UK marketing manager, said: "We comply with all legislation."

He said retailers were encouraged to set prices at a level where they could afford to provide support and service and not just return goods. Seven out of 10

returns were not faulty and he told of a branch of a multiple which returned 12 VICs.

One had a broken key and the second was just a package with no computer inside. The others were not faulty.

Among the reasons for return: the user had not turned on his TV, the TV had not been tuned to the computer, a cassette would not load because the user had not typed LOAD.

He said of Mr Mehdi: "We can't stop him and we would not dream of stopping him. What concerns us is that you get what you pay for. With a packet of cornflakes you just put them in a bowl, pour on milk and eat them. Computers are different."

In any case, he said, retailers the size of Crestmatt would be supplied by one of five UK distributors.

Microtalker is a new speech synthesiser for the Oric, BBC computer and Atom from R.P.S. Electronics. Priced at £46.86, including postage, it uses the GI SPO-256 speech chip and is programmed in BASIC. The unit has a built-in amplifier, volume control and speaker.

R.P.S. Electronics, Unit C200, Saltire Workshops, Ashley Lane, Shipley, West Yorkshire

# You could be on our pages

We welcome programs, articles and tips from our readers.

**PROGRAMS** must always be sent on cassette. Listings are helpful, but not necessary. Check carefully that they are bug-free. Include details of what your program does, how it works, variables you have used and hints on conversion.

**ARTICLES** on using home computers should be no longer than 2,000 words. Don't worry about your writing ability — just try to keep to the style in HCW. Articles most likely to be published will help our readers made better use of their micros by giving useful ideas, possibly with programming examples. We will convert any sketched illustrations into finished artwork.

**TIPS** are short articles, and brief programming routines which we can put together with others. Your hints can aid other computer users.

Competitive rates are paid.

Keep a copy of your submissions and include an SAE if you want them returned. Label everything clearly and give a daytime and home phone number if you can.

Paul Liptrot, Home Computing Weekly, No. 1 Golden Square, London W1R 3AB

# Rely on the reviewers

Whilst applauding Kevin Irving's motives in trying to improve the general standard and value of commercial software (*One Man's View, HCW 41*), I was surprised by his almost totally subjective approach. To me, it raises questions as to his effectiveness as a suitable reviewer of software.

Surely the main point on which a potential buyer needs guidance is to what extent the program in question achieves its objectives?

Now if the software is a game then the objective must be to provide fun and entertainment which is rewarding to play repeatedly.

It matters little to "Joe Public" which method is used. Machine code, BASIC or Chinese hieroglyphics, the buyer should be well satisfied if he can repeatedly load it, play it and enjoy it.

It seems that many programmers, while showing off their expertise in producing lightning-fast, machine coded, all flashing "Galaxian Frogging Munchers", miss out completely when it comes to providing intelligent entertainment of lasting value.

For the buyer who is programming-minded, software written in BASIC can often benefit him far more than anything written in machine code. He can get knowledge and pleasure from exploring the structure of the game and seeing how certain effects can be achieved using a language he can readily understand and use.

It is my view that the problem of varying standards and quality is not precipitated by the "cowboys" of the software world, which is anyway more art and motivation than "high tech."

Rather, the problem is brought on the established software houses, bankrupt of ideas, who have a great deal of money staked in the business.

They have to keep coming up with new — and not always worthwhile — merchandise in a similar way that record companies have to "churn out" hit records in order to maintain their existence, hoping their latest product will be the one of their 500 or so which makes it into the Top 10.

It is highly unlikely that a small group of people, however highly skilled in programming, can consistently turn out new and good games with worthwhile difference.

But the pressure is on them to do just that — hence the problem.

My advice to potential purchasers is to take notice only of what the reliable reviewers say about the package, especially those who work for HCW.

Disregard the temptations produced by the glossy advertisements and if it means mail order then so be it.

John Braithwaite  
Bournemouth

● This space is for you to sound off about the micro scene, to present bouquets, to hurl brickbats. Share your views by sending them to Paul Liprot, Home Computing Weekly, No. 1 Golden Square, London W1R 3AB. Please give your occupation and your interest in computing.

## Digger

From front page

hours trundling round a demonstration site and digging holes and filling them in aboard a JCB model 3CX. He took away an armful of brochures and a scale model so he could get the machine's movements just right.

"He had a great time," said the man who came up with the idea, Peter Minshall, of J. C. Bamforth.

He wanted a novel incentive for staff and dealers, but then David Johnson-Davies, 29, managing director of Acornsoft, said he believed it would sell in the shops.

Mr Minshall said: "One of the conditions was that we didn't want the JCB blown up on the screen. In fact in the game the aliens want it!"

He said his 16-year-old son Andrew played the game on his home computer and liked it — but daughter Helen, 13, was not so keen. But she was not as keen on computing.

Mr Johnson-Davies said the game, which will cost £9.95, is unlikely to be available for the Electron, Acorn's lower-priced computer, because it used the BBC's sideways scrolling feature unavailable on the Electron.

Acornsoft, 4A Market Hill,  
Cambridge CB2 3NJ

## TED arrives

From front page

manager, John Baxter, said: "It will have far more commands and, yes, it's incompatible with the other computers — but you can't have it both ways."

The new model was being shown at the Consumer Electronics Show in Las Vegas, but Mr Baxter said that prototype may not be the version to go on sale here.

He said: "There are six options we could take up, ranging from a model with a toy keyboard upwards. But we will not be selling a model with a toy keyboard."

Would the new model hit sales of the Commodore 64 and the VIC-20?

Mr Baxter said: "It depends how we position it in the market and the price. Everyone said the 64 would murder the VIC, but it didn't. The VIC is still on sale and it's selling like hot cakes."

"It will fit into our existing range."

He said magazines often mistook the market to which computers were aimed.

For example, he said, the portable SX64 — now on sale for £895 — was believed to be a

business computer.

He said 85 per cent of sales would, in fact, be to home users and to people who used them both at home and at work — as well as companies who gave it to their salespeople and for uses like data entry.

Mr Baxter said: "If it was solely a business computer I would only sell 1,000-2,000 a month. It's horses for courses."

● Simon's BASIC II, adding another 86 commands to the Commodore 64, will go on sale in two months at about £9.95 on tape and £14.95 on disc. It works only with the original Simon's BASIC (114 commands), which is supplied only on cartridge. Commodore says supply problems have now eased.

Commodore, 675 Ajax Ave,  
Slough, Berks SL1 4BG



Clement Chambers, centre, with Jeff, right, and Jerry Wayne, of ORP

## Worlds war — at home

The War of the Worlds will soon be fought out on home computers in a 10-part game based on H. G. Wells' book and an album based on it.

CRL's managing director Clement Chambers has signed a deal with New York company ORP which has the game rights to the book and programmer Nigel Taylor, 15, has started work.

Spectrum and Oric versions are planned for March, followed by Commodore 64, BBC, Electron and Dragon.

CRL, 9 Kings Yd, Carpenters Rd,  
London E15 2HD

Sinclair's new computer, called the QL and priced at £399, will be in the hands of the first users by the end of next month.

In a major change of direction, the 128K micro is designed for the serious home, business or professional user.

Sir Clive Sinclair and managing director Nigel Searle outlined the main features:

- 128K of RAM with 0.5M expansion to come. Up to 32K is taken for display use
- Two built-in Microdrives, each with a capacity of 100K — about 10K more than standard Microdrives
- 32-bit Motorola 68008 processor
- Full-size keyboard with 65 shaped keys with audible click. Includes five function keys, four cursor keys
- High-resolution colour display in two modes: 512 by 256 (four colours) and 256 by 256 (eight colours). Text: 85 columns, 25 lines or up to 40 to 60 columns with TV depending on software
- Four software packages included, all written by Psion: QL Abacus, spreadsheet; Archive, database; Easel, graphics; Quill, word processing

Many of the QL's capabilities, like multi-tasking and window display — up to 10 at once on screen — are normally available only at several thousand pounds, said Sir Clive.

Measuring 5½ in x 1¼ in x 3¾ in and weighing just over 10 lbs the QL offers ports for networking at 100K baud between 64 computers, dual joystick and ROM cartridges expansion.

RS-232-C interface is provided and RGB and TV ports.

Using the expansion slot up to six QL Microdrives can be stacked — giving 800K maximum.

Based on four semi-custom ICs, the QL incorporates a 32K

# Sinclair's QL micro: all the facts

Paul Liptrot reports

## QL SuperBASIC keywords

ABS	AUTO line numbering when entering programs	INK	END REPEAT	REPEAT	RND
ATAN	BAUD rate for both serial channels: 75, 300, 600, 1,200, 2,400, 4,800, 9,600 or (transmit only) 19,200	END	REMARK	RESTORE	RESTORE
ACOT	BLOCK fill block with specified colour	PRINT	PILOT	RANDOM	random number generator
BEEP	CAT display catalogue of cartridge in specified Microdrive	PLAUS	PAUSE	POKE	POKE
BLOCK fill block with specified colour	BORDER	PAPER	PAPER	PEEK	PEEK
CAT display catalogue of cartridge in specified Microdrive	CHRS	OPEN	OPEN	PAN	PAN window to left or right
BORDER	CHRS	ON	ON GOSUB	ON	ON GOTO
CHRS	CLEAR	NEW	NEW	OVER	OVER
CLEAR out variable area	CLEAR out variable area	MERGE	MERGE	ON	ON GOTO
CLS current window	CLS current window	LN	LN returns natural log	MODE	MODE
CONTINUE	CONTINUE	LIST	LIST	LRUN	LRUN loads specified Microdrive
COS	COS	LEN	LEN	LOCAL	LOCAL
CSIZE sets character size	CSIZE sets character size	INT	INT	LOG	LOG to base 10
DATA	DATA	INKEYS	INKEYS	LOAD	LOAD
DEFine FuNction	DEFine FuNction	RUN	RUN	LET	LET
END DEFine	END DEFine	SBYTES	SBYTES save areas of memory	INVERSE	INVERSE
DELETE removes file	DELETE removes file	SCALE	SCALE for graphics	INPUT	INPUT
DRAW line	DRAW line	SELECT	SELECT	SAVE	SAVE
EXEC loads sequence of programs and executes them in parallel	EXEC loads sequence of programs and executes them in parallel	SQRT	SQRT square root	SIN	SIN
FLASH	FLASH	STRIP	STRIP current strip colour	SCROLL	SCROLL
FORMAT cartridge	FORMAT cartridge	TAN	TAN	END SELECT	END SELECT
GOSUB	GOSUB	UNDERline	UNDERline in current ink	STOP	STOP
GOTO	GOTO	USR	USR	TAB	TAB
IF THEN ELSE	IF THEN ELSE	WINDOW	WINDOW create window	TRACE	TRACE
		WHEN	WHEN	USE channel	USE channel

### Taken from the provisional QL user guide

ROM — containing new QDOS operating system and SuperBASIC, an enhancement of Spectrum BASIC.

Potential expansion is "almost unlimited" due to the Motorola 68008 32-bit processor with its one megabyte (empty) linear address capability.

Peripherals and enhancements, will include: 0.5Mb memory expansion board, Pascal compiler, 68000 assembler, terminal emulator, analog/digital interface, hard disk interface, modem, parallel printer interface with multi-channel sound-generator, IEEE-488.

Testing and quality control is now under way at Thorn EMI Datatech, Feltham, where production is scheduled to reach 20,000 units a month by

summer. A second source during late 1984 is planned.

The QL is supplied with 1.8 amp power supply, manual (containing a course in SuperBASIC), software on microdrive cartridges, four blank cartridges.

Apart from RGB monitor, power sockets and TV ports, there are nine others: internal expansion (one) Microdrive expansion (one), ROM cartridge (one), serial (two), local area network (two), joysticks (two).

Sir Clive said his company, which now had 60 per cent of the home micro market, had decided to leapfrog to a 32-bit processor — hence QL, for Quantum Leap.

"It will do anything the IBM PC will do and more," he said. And, talking of his approach to



There are two slots for Microdrive cartridges

the BBC to make the corporation's "official" micro, he said: "We would very much like to redress the balance where our competitor (Acorn) gets massive free publicity."

He pointed out: "Unlike the BBC it (the QL) will not be made overseas in the foreseeable future."

Other points:

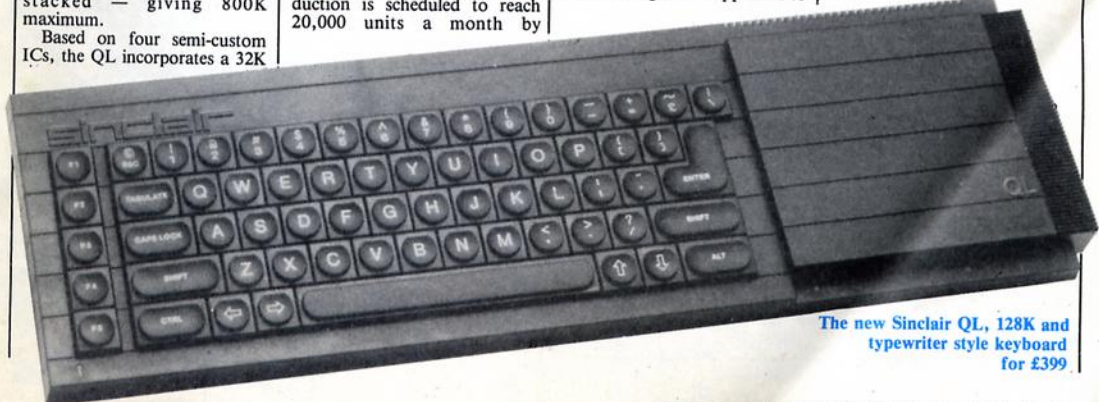
- Retail sales are to start in the second half of the year along with sales overseas, priced at \$499 in the U.S., where it will be sold by Sinclair.

- The QLUB (QL Users' Bureau) membership will cost £35 a year with six newsletters, early offers and software updates.

- The QL has no cassette interface.

- To come: 32K ROM cartridges, Winchester hard disk interface, and Prolog, C and other languages.

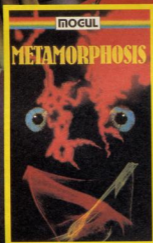
Sinclair Research, Stanhope Rd, Camberley, Surrey GU15 3PS



The new Sinclair QL, 128K and typewriter style keyboard for £399

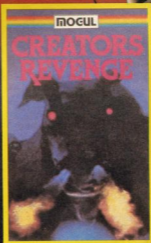
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## THE HOTWARE PEOPLE



### METAMORPHOSIS

You stumbled into the nest of the **Cyglorx** and find yourself fighting off robot tanks guarding the **Cyglorx** eggs. You think you have everything under control and then the eggs start hatching. Commodore 64 version features 4 different screens.  
VIC 20 - COMMODORE 64  
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COMMODORE 64  
£7.95

### OTHER GAMES AVAILABLE



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# Spot the differences and

You've got 200 chances to win Vortex games — and all you have to do is spot the differences. The tapes are waiting to be sent to the winners, so send us your entry as soon as you can

# win great games from



land mines and alien life forms, including Millitoids, Hoverdroids and Bouncers.

Both games have fast-action colour graphics, keyboard or joystick option, several levels of difficulty, five lives, and on-screen scoring.

### How to enter

Study the two cartoons: there are a number of differences between the two. Circle the differences — in ball-point pen.

Then fill in your name, full address and the number of differences you found.

Cut around the broken lines, seal the drawing with coupon attached in an envelope — and write clearly on the back of the envelope the number of differences you found.

Post your entry to Vortex Competition, Home Computing Weekly, No. 1 Golden Square, London W1R 3AB.

There's 200 chances to win Spectrum software from Vortex in this week's fun-to-enter competition.

And, like all competitions in Home Computing Weekly, entry is easy and free. Just mark the differences and send the coupon to us.

### The prizes

Vortex is giving away Spectrum games worth £1,049 to the prize-winners.

The first 10 winners will each receive copies of the top selling games Android One — The Reactor Run and Android Two. The next 190 winners will each get a copy of Android One.

**Android One — The Reactor Run**, for either model of the Spectrum, challenges you to destroy the reactor before the reactor destroys the world. Your only weapon is a metallic android. You must blast through brick walls, mazes and strong rooms, dodge moving obstacles and overcome hordes of fiendish mutants. Price: £4.95.

**Android Two**, for the 48K Spectrum only, pits you against hazards like the maze of death, the paradox zone,

the solution and the names of the winners will be published in the news columns of Home Computing Weekly and the prizes will arrive from Vortex within 28 days of the publication date of that issue.

### The rules

The 10 winners of two games will be the first 10 entries opened after the closing date: Friday 3, 1984. The other 190 winners, who will receive one tape each, will be the senders of the next 190 opened.

Coupons which are not fully completed and envelopes without the number of differences found on the back will not be considered.

Entries will not be accepted from employees of Argus Specialist Publications, Vortex Software and Alabaster Passmore & Sons. This restriction also applies to employees' families and agents of the companies.

The winners' names and the solution will appear in Home Computing Weekly. The editor's decision is final and no correspondence will be entered into.



## Vortex Competition

### Entry Coupon

Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

post code \_\_\_\_\_

Number of differences found: \_\_\_\_\_

Complete clearly — this coupon will be used as a label if you are among the winners. Don't forget to write the number of differences on the back of the envelope as well. Post to: Vortex Competition, Home Computing Weekly, No. 1 Golden Square, London W1R 3AB. Closing date: Friday February 3

Son of Oric, the 48K Atmos computer, took a bow today. At £170, it has a typewriter keyboard, new BASIC commands and the oddities suffered by its parent removed.

It has a restyled black and red case — with matching colour printer and new 3in disc drive — and BASIC programs are compatible with the Oric.

But a new ROM operating system means machine code programs will have to be changed.

These are the main new features:

**Keyboard:** 58 keys all with auto repeat, including ESCape, ConTRoL, RETURN and additional cursor keys. A function key may be used by programmers.

**Operating system:** Oric Products' director of research and develop-

# Enter the Atmos, son of Oric

**Oric Products is taking on the likes of the Electron with its restyled 48K Atmos computer. How does it compare, both with its parent and with the opposition? Here are the first details**



New disc drive for both Atmos and Oric. Based on Hitachi mechanism, each 3in drive can hold up to 320K



The Atmos, in re-styled black and red case, shaped a little like Acorn's new £199 micro, the Electron

ment, Dr Paul Johnson, said quirks in early Orics has been removed, along with some in the Microsoft BASIC.

He said: "We have also solved the Microsoft bug in the FRE command and can now give an accurate print-out of available user memory."

Oric says the GRAB command enabled greater use of memory by allowing use of memory usually allocated for graphics. With serial attribute handling this meant at least 44K was available even when printer and disc drives were attached in text mode.

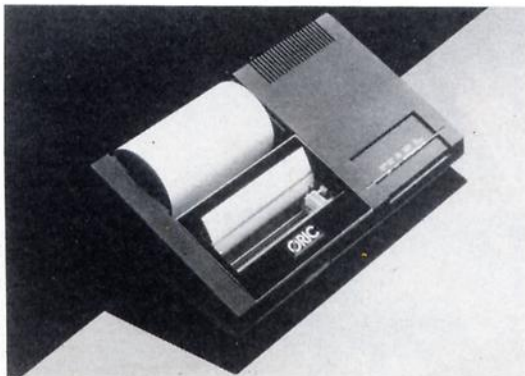
**Cassette handling:** The Atmos has VERIFY, STORE, and RECALL of arrays (integer, floating point or string) and displays program details like file name and type of file before running.

The "welcome" tape includes a machine code program allowing the user to over-ride the error

problems caused by errors in the header and leading portion of the tape which have no effect on the program.

**Manual:** Oric commissioned Pan Books and writers led by Ian Adamson to compile a manual of nearly 300 pages which includes chapters on machine code, system calls, printers and commands and sample programs. And there is also a leaflet for beginners.

**Disc drive:** Due on sale by the end of the month, the new Oric disc drive is the Hitachi 3in model with double sided, double density discs holding a maximum of 320K. Controller, operating system, case and power supply are added in the UK to the Japanese product.



The Oric Products printer-plotter in its new livery. Already on sale, it uses four tiny ballpoint pens on 4in plain paper rolls. It is similar to Tandy's printer-plotter and those from other companies

checking facility and auto-run the program.

This, says Oric, overcomes

One observer who has used the new computer said the internal layout is virtually identical to the

Oric-1 and adds commands like Verify and merge which were promised for the first model.

However, the Atmos is said to be about 30 per cent faster, thanks mainly to the re-written routines for screen and keyboard handling.

The Atmos, which began production yesterday, was shown for the first time at the Which Computer? Show in Birmingham.

It is exactly the same size as the Oric — 2in high, 11in wide, 7in deep — and even weighs the same: 1.1Kg.

*Oric Products International, Coworth Park, London Road, Ascot, Berks SL5 7SE*

## Atmos BASIC keywords

ABS	AND	ASC
ATN	CALL	CHAR
CHRS	CIRCLE	CLEAR
CLOAD	CLS	CONT
COS	CSAVE	CURMOV
CURSET	DATA	DEEK
DEF	DIM	DOKE
DRAW	EDIT	END
EXP	EXPLODE	FALSE
FILL	FN	FOR...TO
FRE	GET	...(STEP) NEXT
GOTO	GRAB	GOSUB
HIMEM	HIRE	HEX
INK	INPUT	IF...THEN
KEYS	LEFTS	...(ELSE)
LET	LIST	INT
LN	LOG	LEN
LPRINT	MIDS	LLIST
NEW	NOT	LORES
OR	PAPER	MUSIC
PEEK	PI	ON
PLAY	PLOT	PATTERN
POKE	POP	PING
PRINT	PULL	POINT
READ	RELEASE	POS
REPEAT	RESTORE	RECALL
RIGHTSS	RND	REM
SCRN	SGN	RETURN
SIN	SOUND	RUN
SQR	STOP	SHOOT
STRS	TAB	SPC
TEXT	TROFF	STORE
TRUE	USR	TAN
WAIT	ZAP	TRON
		VAL



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SCOPE is a fully structured multitask language specifically for writing graphics, animation and sound. Being fully compatible with BASIC it is ideal for writing both arcade and adventure style games. Additionally, with SCOPE present in high memory it can be used as an assembler with SCOPE words as plain language mnemonics. Therefore no knowledge of machine code is required. The language is extremely easy to comprehend and is very powerful indeed providing many features not available from BASIC.

**SCOPE HAS TO BE USED TO BE BELIEVED**

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# MIKRO-GEN

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**TWO**  
great games  
from Sabren  
Developments



The chart-hitting

## Mad Martha



Poor little Henry is the hen-pecked hero of this domestic tale. One night Henry can take no more. He steals his wages from his wife's purse, and sneaks out of the house being careful not to wake the baby or trip over the cat, and heads for the bright lights to have some fun. Trouble is he runs out of money. His only way to raise some cash is to gamble his few remaining pounds on the spinning wheel of the roulette table.

Just as Henry is getting in to his evening at the tables his wife — Mad Martha — has noticed his absence. Realising Henry has absconded with the housekeeping she sets out after him with an axe. Guess what part you play in this happy tale? That's right, you're Henry. Watch out for that axe!

A game to invest in... funny, genuinely original, and the graphics are great... hit the key to begin, the Spectrum plays a real Hollywood-style movie theme tune, and the hunt is on!

Personal Computer News

Marvelous adventure, really dotty... a refreshing change from some of the doomladen programs encountered nowadays... a game where you won't get to the next stage without solving the present conundrum.

Popular Computing Weekly

And now —

## Mad Martha II



Time for the annual holiday and Martha decides to visit her half-cousin Manuel, who is a waiter in a plush hotel in Barcelona.

One afternoon, Martha sets out on a bus tour with her son, young Arbutnot, leaving orders for Manuel to keep an eye on Henry. Unbeknown to Martha, crafty Henry has a Spanish pen-pal, and has planned a secret rendezvous. Henry leaves the hotel, brimming with enthusiasm and Manuel (who is totally wacky!) is hot on his trail. The adventure takes us through the thrills and spills of a madcap chase, taking in amongst other delights, a bull fight in which poor Henry is forced to play the leading role. Guaranteed laughs and fun for all the family!



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# Put your finger on the action

Five games for fast movers, speed-tested by our review panel

## Heist 32K BBC £6.95

Your little man climbs up and down ladders in an attempt to grab bags of money without getting nobbled by nasty bank robbers.

The game is very good and had me playing for hours. The instructions were printed on the cassette insert and were easily followed.

The bank manager has to collect up the bags of money without being killed by four burglars who sometimes plant time bombs which he has to defuse — no ordinary bank manager.

The graphics and sound are both very good. You can turn the sound off, but if you do, watch out for the bombs or you'll miss the ticking.

The only thing I found very

## Postman's Knock TI-99/4A £4.95

Lizard Games, 14 Bridgwood, Brookside, Telford.

The documentation for this odd game is quite detailed, if unlikely to survive the usual wear and tear of being handled frequently.

I always thought that Postman's Knock was an excuse for mass lechery, but not so.

I assume that the 'knock' in the title refers to the noise of your bike as it invariably hits a tree, but I could be wrong.

The aim is to boldly go and deliver some letters by obliterating the houses to which you deliver, followed by a trip round the postboxes collecting further letters.

You have to land on the postboxes in order to collect the

post, which probably won't do the bike much good. Then you're off to deliver the post to the Post Office with a subsequent parcel collection thrown in for good measure.

You are awarded so many points for landing on the right items at the right time, and have them deducted if you don't hit the right things. It is all too easy to compile a negative score by playing chicken with the trees.

The game format is very similar to that of Ski-run-type programs, but it has sufficient additional elements to make it quite amusing — if you have the right sense of humour.

instructions	95%
playability	95%
graphics	85%
value for money	70%



## Sheer Panic Spectrum £5.95

Visions, 1 Felgate Mews, Studland St, London, W6

Goodness knows what Arthur Scargill would make of the working conditions in the Magnetic Quartz mine in a Dromedan Leisure complex.

But I suspect that even his lads would think twice before taking on the natives in this game.

You play a sort of England soccer fan-type role, charging round the mine up and down ladders between different levels digging holes for the poor residents (Dromedaries?) to fall into.

When they do, you belt them through the floor with a long-handled shovel.

## Dracula's Revenge 48K Oric £6.95

Softex, 12/13 Henrietta Street, Covent Garden, London WC2

Climb up and down ladders to avoid the baddies. In this case they are an unpleasant collection of werewolves ghosts and vampires.

You are a fearless friar out to sanctify the castle homes of these poor creatures. To do this you must flood the floor of the castle with daylight to kill ghosts and vampires or shoot werewolves with a silver bullet.

It's not quite as simple as that, though, and the action can be quite frantic.

Excellent use of Oric's colour, graphics and sound combine with some nice animation to produce a

good game. I like the facility provided which allows continuous practice without losing your lives. However in this mode you will not be able to enter the hall of fame. The standard Oric cursor keys are used for control. I find them quite adequate, and wonder why more companies don't standardise on this method.

Dracula's Revenge is, in summary, one of the better games around for Oric and should certainly find favour with the games player providing he is not frightened of the dark.

instructions	85%
playability	90%
graphics	90%
value for money	85%



annoying was the High Score list. To enter initials, you positioned a cursor over the letter then pressed return.

More often than not I didn't bother. Why didn't Softspot use the normal Hi-Score input routines around? J.H.

instructions	95%
playability	95%
graphics	85%
value for money	95%



## Robot Riot 48K Spectrum £5.95

Mikrogen, 24 Agar Crescent, Bracknell, Berks

Catastrophe at the robot factory! The robots have all escaped and are wandering around in the corridors and on the many floors of the factory. The control room has been taken over by the King Robot.

To deal with this you have to lay bombs along the corridors of the first floor, dodging around red fire dots which open and close in various places.

However, King Robot escapes to the next floor and you have to get to the control room to follow him without being caught by the escaped robots wandering around.

The robots have different speeds. Some kill you, others just make you weaker, but you can toughen up again by picking up power mites.

There is also a time limit: you have to get to the control room before the bombs go off. If you make it, you start again on the next floor.

There's a choice of keyboard or Kempston joystick control. The instructions take up so much time that the option to go straight to the game is very necessary.

It's really just another mite game, but well presented and enjoyable.

instructions	90%
playability	80%
graphics	70%
value for money	60%



Some beasties are tougher and need to be dropped through more than one level. Try to clear each level before you run out of oxygen or get eaten!

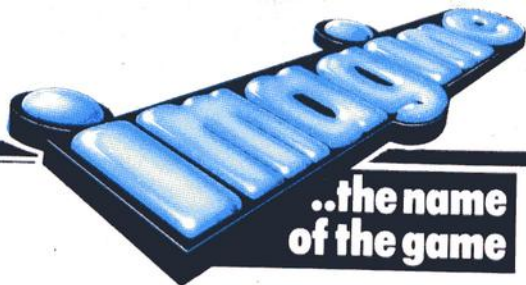
The game has nine levels of play and is quite a challenge in the later stages.

The graphics are fairly good and the Spectrum's limited sound is used well to add to the excitement. Control is by keyboard or Kempston joysticks.

Definitely high on addictiveness, and great fun to play. D.J.

instructions	90%
playability	90%
graphics	90%
value for money	85%





## SITUATIONS AVAILABLE AT

**IMAGINE SOFTWARE LTD** is the largest and most successful game software house outside of the U.S.A. with more than 100 staff occupying 19,000 square feet of premises throughout Liverpool. Imagine Software are at the forefront of today's exciting software industry. As a result of Imagines' advanced and imaginative expansion program the following positions have become available. In all cases remuneration is commensurate with ability and seniority and is above industry standards. In many cases a new car and numerous fringe benefits will be part of the package. Relocation assistance will be given to successful candidates wherever needed.

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Two positions exist for systems software programmers working on very advanced products. Both positions are exciting and innovative. For the first, applicants must be fluent in the 'C' language and MCS68000 assembler and be familiar with Unix type operating systems.

Applicants must be able to demonstrate a wide knowledge of advanced development tools. The second position requires a fluency in pascal and MCS68000 assembler and familiarity with the UCSD operating system. Experience of computer graphics and general business orientated applications software will be an advantage.

### PROGRAMMERS

Thirty positions exist for programmers working in a team environment on many diverse aspects of microcomputer software, including the conversion and adaption of games to new microcomputers.

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### GRAPHICS PROGRAMMERS

Two positions are available for programmers with skills, experience and knowledge of microcomputer graphics as applied to games software.

Applicants must be fluent in at least one popular microcomputer assembly language and preferably have a working knowledge of one other, plus familiarity with currently available microcomputer capability. Provable experience and/or ability essential.

### COMPUTER MUSICIANS

Two openings are available for programmers who have the ability to write music and sound effects for popular micros. The applicants must have a good knowledge of an assembly language and proven musical skills.

### GAME DESIGNERS

Two positions exist for game designers to design a wide variety of entertainment software. Applicants will have both experience in general games design and theory plus a working knowledge of microcomputers.

### TECHNICAL WRITER

An opening exists for a technical writer to prepare software manuals for both commercial products and internal development tools. A recognised writing qualification will be necessary for applicants as will a very wide working knowledge of microcomputers.

### GRAPHIC ARTISTS

There are six positions available for artists working on games design and production using computer based graphic tools. A knowledge of microcomputer graphics plus excellent artistic skills are the qualifications for these positions.

Applicants should in the first instance send their C.V. to:  
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**IMAGINE HOUSE, 5 SIR THOMAS STREET, LIVERPOOL L1 6BW**  
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written by Stephen Renton

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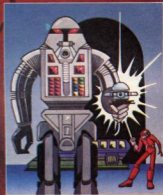
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"Alien Intruder/Hieroglyphics — Both programs make good use of graphics and words to make a very entertaining package." (Sinclair User, Aug '82)

"Alien-Hieroglyphics/Wumpus/Movie — A varied mix from Carnell, all featuring imaginative responses and graphics and all of them good games for all ages. (Hieroglyphics is particularly good for children)." (Popular Computing Weekly, Aug '82)



**STARFORCE ONE**

Take on the robot guardians of the central computer in a superbly styled, 3-dimensional battle game. 48K Spectrum £3.95.

(100% MACHINE CODE ARCADE ACTION)



**THE DEVIL RIDES IN**

I uttered the last incantations as the clock struck thirteen. All hell silent except for a faint rustling in the corner. From out of the shadows they came. All Hell's fury against me but I was not defenceless until the Angel Of Death, astride a winged horse, joined the battle. Avoiding his bolts of hell fire, I took careful aim. My chances were slim, but if my luck held . . . 48K Spectrum £5.95

(Fast moving, machine code, all action, Arcade game)



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"The Wrath Of Magra" comes as three, 48K programs on cassette, boxed with instruction manual and book detailing the history of the Third Continent and the many spells you will be using throughout the game.

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CARNELL SOFTWARE LTD

## Into the Empire Spectrum £4.95

Penguin Books, Harmondsworth, Middlesex

The final part of the Korth Trilogy from Puffin featuring the novel concept (no pun intended) of a book to read and a tape to play games from.

As in part one, our intrepid hero persons Kane, Louis and Xenia get themselves into tricky situations, two of which are reproduced as games.

Fog has friends and foes appearing out of the 'fog' of a blank screen to be zapped at will. Oldren is very, very similar to Raid contained in the first pack, and Empire is a simple economic simulation giving your child the chance to run an empire.

As before, lack of error trapping makes the games stop abruptly, BASIC makes them run slowly, and there appears to be a bug in Empire.

I cannot honestly enthuse over the contents of this pack, though it's undeniably good value. The concept however is good, and given an imaginative plot, the mixture of computer game and good book could be a winner.

Perhaps Puffin should use some existing best sellers and commission a software house to write the games?

D.M.

instructions	60%
playability	60%
graphics	60%
value for money	95%



## Escape from Arkaron Spectrum £4.95

Penguin Books, Harmondsworth, Middlesex

'Read the book, use the tape and take part in the adventure your-

self!' says the smart sleeve of this book and game package from Puffin. It's part of the Korth Trilogy, a sci-fi series for young people, in which three young members of the Interplanetary Patrol take on the might of the Korth Empire.

The book has rather boring looking line drawings and an uninspired text suitable for 10-11 year olds. I enjoy sci-fi, but I

## Uncle Groucho 48K Spectrum £10

Automata, 27 Highland Road, Portsmouth, Hants

Another Hidden Prize fun game from the Pimania people. You follow Groucho and the PiMan across the USA, trying to guess which film star Groucho is pretending to be at the moment.

Guess correctly and you get one of the 22 clues to the Mystery Star, whose name wins the prize. Mum or gran are essential because the stars are mainly 1940 vintage.

Currency is cigars — 200 to start — and an amusing horserace and Casino offer opportunity to make more.

PiMan does his famous give/take routine and there are the usual unconnected interruptions and really appalling 'I say, I say'

jokes.

Graphics are excellent — an example of how to use even letters to great effect.

After a few plays, the constant beeping of "There's No Business Like Show Business" and the delays while the program sorted data, began to be irritating.

Interruptions are not as inspired as the Pimania ones, happen too often, and your horse wins at Evens — presumably an Outsizer.

And to make it impossible to get the 22 clues in one go (the program goes into an end routine at 18, even if you have cigars in hand) is cheating, particularly as you have to re-load to try again. A good try but can do better. D.C.

instructions	25%
playability	60%
graphics	90%
value for money	60%



## Castle Colditz/ Battle of the Toothpaste Tubes 48K Spectrum £6.95

K-tel, 620 Western Avenue, London W3

Two games on one cassette.

Castle Colditz is supposedly a role-playing game, with you as the POW trying to escape. You're warned of confrontations with Death, and advised to draw a map.

But map making is pretty futile if you can go Up, North and West and finish up where you started. And I travelled some 30 rooms without meeting Death or, indeed, any other kind of problem.

# Extra! Extra! Read all about it

These games all have just a little bit more — whether it's a competition to enter, a book of the program, or another game on the back. Good idea or gimmick? See what our reviewers have to say

couldn't summon up enough interest to read the book all the way through.

My nine year old couldn't be bothered after the first page. He just wanted to play the games, of which there are three.

Testrun is a crude space flight simulator involving dodging meteors and setting speeds. Rather confusing until you get the hand of it, then it's boring.

Prisoner is a similarly crude maze game, and Raid is a

simplified chess type strategy game.

All are principally in BASIC and thus slow, are not error trapped, so they can be brought to a confusing halt quite easily and are about the standard of magazine listings.

D.M.	
instructions	60%
playability	60%
graphics	60%
value for money	95%



## Alien Demon/Plague VIC-20 £6.95

K-tel, 620 Western Avenue, London W3 OTU

It was only a matter of time before the TV demons K-tel became involved in the software game. To my delight, they have done so with an unusual idea . . . two programs on one cassette.

One odd feature of this tape was that one game requires 8K expansion while the other requires none, so if you have no memory expansion one game will be unusable.

The games themselves represent extremes in quality. Alien Demon is a neat graphical adventure based loosely on that superb film Alien.

The game has some nice

graphical touches and is sufficiently difficult to maintain interest. For some odd reason, however, no sound was used.

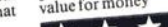
Plague is a sort of frantic, shoot everything in sight arcade type game which, quite frankly, bores me to tears.

Everything moves too quickly and the screen becomes overloaded with twitching objects (viruses). As usual the idea is to last as long as possible.

Apart from the use of multi-colour mode graphics, this game is utterly forgettable.

Overall, the two-game package is good value, but K-tel will have to improve its standards if it wants to succeed in the software jungle.

A.W.	
instructions	40%
playability	60%
graphics	80%
value for money	70%



There are only two problems in this adventure — finding the exit, and finding the enthusiasm to bother.

In the second game, you are a toothpaste tube trying to fire paste at a line of scrolling toothbrushes while avoiding missiles from the mini-tubes, and the false teeth that have a biting need to make contact with your rear.

The game starts so fast that I always lost a life, even on the easy

level. And although the graphics are nice, your tube is so large that the missiles can hardly miss.

Frankly, I've seen better games than these in magazine listings. Not very good value even for two.

D.C.	
instructions	60%
playability	10%
graphics	60%
value for money	30%



# AGF

# PROGRAMMABLE JOYSTICK INTERFACE for Spectrum or ZX81

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### PROGRAMMABLE INTERFACE

The AGF Programmable Joystick Interface is a unique design offering the use of any Atari-compatible joystick with absolutely all software, whether it is cassette or ROM cartridge, with the Sinclair Spectrum or ZX81.

The hardware programmable interface requires no additional software and accurately replicates the keys of the computer in a manner which is responsive to absolutely ALL key reading methods, both BASIC and Machine Code.

The interface does not interfere with key operation and can therefore be used simultaneously with the keyboard.

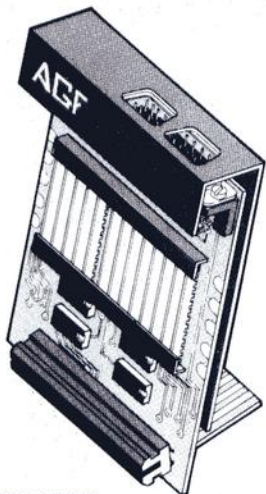
There is no need to remove the interface once fitted as the rear extension connector will accommodate further expansion, i.e. printers or RAM packs etc. This important feature avoids excessive wear to the expansion port.

The key replication principle pioneered by AGF means that your own programs can use eight directional joystick movement by utilising simple key reading BASIC.

Two joystick sockets are provided which share the same keys, for use with the majority of two player games. Several interfaces may be used on the same computer for multiple joystick applications.

The interface is programmed by a two digit code, which is looked up on a programming chart supplied, for each direction and firing button. The two numbers are then selected on a pair of leads which are clipped onto appropriately numbered strips on the interface.

Once configured this can be marked on a Quick Reference Programming Card for storing with the game. As the programming is not power dependent the interface retains the last configuration made and can be immediately used when next switched on.



### KEY FEATURES

- ★ Programmable design gives TOTAL software support.
- ★ Accepts Atari, Competition Pro, Wico, Starfighter, Quick Shot, Le Stick etc.
- ★ Rear extension connector for all other add-ons.
- ★ Free demo program and instructions.

### PACKAGE CONTENTS SUPPLIED

- Programmable Interface Module as illustrated, complete with clip-on programming leads.
- Self adhesive programming chart detailing how to define which key is simulated by UP, DOWN, LEFT, RIGHT, and FIRE. This can be fixed on to the case of your computer or if preferred the protective backing can be left on. The chart is made of a very durable reverse printed plastic and is extremely easy to read.
- One pack of ten Quick Reference Programming Cards for at-a-glance setting to your games requirements. The card allows you to mark the configuration in an easy to read fashion with space to record the software title and company name.
- Video Graffiti demonstration program which is written totally in BASIC to illustrate how all eight directions and fire can be read. This is also a useful high resolution drawing program.
- 12 months guarantee and full written instructions.

## JOYSTICKS

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	PACK(S) QUICK REFERENCE CARDS	1.00	
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ZX81 <input type="checkbox"/> ZX SPECTRUM <input type="checkbox"/>		Please tick	
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## Get more from your 64 with our Extended BASIC

This is the start of a three-part series which will give you extended BASIC on the Commodore 64 with many new commands.

The first two parts will give a listing of the machine code — 4K of code in DATA statements in much too long to be swallowed in one go!

The third part will give advanced instruction and example programs.

Each machine code listing in the first two parts contains several useful routines, but the full potential of Extended BASIC is only achieved when they are linked.

Be careful, as any mistake in the code may cause loss of the program. So always SAVE the program before you use the code.

To help you find mistakes, a checksum is included. It adds up all the numbers in the DATA statements. If the total is incorrect, some of the numbers are wrong.

After the program has been POKEd into memory, the BASIC routine is no longer needed and you can learn to use the commands.

This week's listing gives the use of three commands: CLEAR GRAPHICS (CLG), POINT and LINE.

For each command you must first POKE in parameters (part two removes this necessity) and then use SYS to run the command.

CLG is the easiest command to use, having only one parameter.

As any of the commands can be used to draw on two separate high resolution screens, a POKE is needed to choose the screen.

POKE 869,X accomplishes this, where X is zero or one, and then SYS 49879 runs the command.

**Program 1 — the machine code.** Type this in first, RUN it, SAVE for safety, then type NEW before entering Program 2. Use the checksum to ensure all the figures are correct. Note: none of the figures in the DATA will be more than 255

```

1 REM*****
2 REM*EXTENDED BASIC PRT 1*
3 REM* BY DAVID REES *
4 REM* (1983) *
5 REM*POINT+CLG+LINE CODE*
6 REM* NO STANDARD BASIC *
7 REM* ENTRY *
8 REM*****
20 T=0
30 FOR M=0 TO 2031
40 READA:POKE49152+M,A:T=T+A
50 NEXT
    
```

This week we start a major three-part series by David Rees which adds many new commands to the Commodore 64. Each week's listings can be used on their own



POINT draws a point on either screen in normal or multicolour mode. To use it, first X and Y coordinates must be poked into memory. Y is straightforward: just POKE a number between zero and 199 to location 862.

X is more complex as it has a range of zero to 319. Two locations are POKEd to. 861 contains the first eight bits (e.g. POKE861, XAND255) while the highest bit is POKEd to 860 (e.g. POKE860,X/256).

There are four other registers to be set. First, colour is set by POKEing 857 to the value required.

To gain text mode, add the following command at the end of the program:

```
POKE56576,PEEK(56576)OR3
```

**Next week:** Low resolution plotting, sound and sprite commands — all available from BASIC with no POKEing.

Next, colour choice (zero-1 in normal mode, zero-3 in multicolour) for the appearing colour to be stored in is POKEd to 858. Lastly, screen choice (zero or 1) is POKEd to 869, and Exclusive OR choice (on = 1, off = zero) is POKEd to 871.

Note that these four registers need only be set once. After this, you can draw as many points as you want to, changing registers only when you need to. After this, to draw the point, use SYS49769.

Line uses the final four registers of POINT in the same way (except viewed colour which must be renewed with each line), so all that needs to be covered is X and Y choice.

Two positions need to be defined (for the two ends of the line), and you only need to POKE to the registers you are changing.

Registers are as follows: 1st point: 828 X high, 829 X low, 830 Y; 2nd point: 831 X high, 832 X low, 833 Y.

They are used in the same way as point registers. To draw the line use SYS 50544. Note that LINE is unreliable in multicolour mode, so in this case use it as your prill!

The demonstration program shows how to use each command, and also shows how to obtain screen zero. To obtain screen one, add the following features:

```
POKEV + 24,128:POKE56576,PEEK(56576)AND252)+2
```

```

60 PRINT"CHECKSUM="T,"IT SHOULD BE 209186"
998 REM***** POINT *****
1000 DATA173,93,3,41,248,141,95,3,206,95,3
1010 DATA173,93,3,24,237,95,3,24,74,24,24
1020 DATA141,98,3,169,4,24,237,98,3
1030 DATA24,10,24,141,98,3,169,1,141,97,3
1040 DATA169,205,98,3,208,1,96,206,98,3
1050 DATA14,97,3,24,144,241,96
1100 DATA173,93,3,41,248,141,95,3
1110 DATA173,93,3,24,237,95,3,24
1120 DATA141,98,3,24,237,95,3,24
1130 DATA24,141,98,3,169,7,24,237,98,3
1140 DATA205,98,3,208,1,96,206,98,3
1150 DATA14,97,3,24,144,241,96
1200 DATA173,93,3,201,1,208,10
1210 DATA173,93,3,74,24,105,128,24
1220 DATA144,5,173,93,3,74,24,74,24
1230 DATA74,24,141,95,3
1240 DATA173,94,3,41,248,141,99,3
1250 DATA173,94,3,56,237,99,3,24
1260 DATA141,100,3,96
1300 DATA169,133,252,173,95,3,160,
1310 DATA204,99,3,240,12,24,105,5
1320 DATA144,3,24,230,252,200,24
1330 DATA144,239,133,251,96
    
```

# COMMODORE 64 PROGRAMMING

```

1400 DATA160,132,254,173,100,3,24,101,251
1410 DATA144,3,24,230,254,208,192,8
1420 DATA208,243,133,253,165,254,150,6
1430 DATA24,101,252,24,208,192,8
1440 DATA208,247,24,105,32,24
1450 DATA133,254,96
1500 DATA160,173,22,208,41,16,201,1
1510 DATA208,52,230,252,230,252,230,252
1520 DATA230,252,173,96,3,201,1,208,12
1530 DATA177,251,41,240,24,189,89,3
1540 DATA24,145,251,96,177,251,41,15
1550 DATA24,14,89,3,14,89,3,14,89,3
1560 DATA14,89,3,24,189,89,3,24
1570 DATA145,251,96
1580 DATA173,96,3,201,1,208,7,173,89,3
1590 DATA141,33,208,96,201,2,208,5
1600 DATA162,240,24,144,18,201,1,208,37
1610 DATA162,15,14,89,3,14,89,3,14,89,3
1620 DATA14,89,3,230,252,230,252
1630 DATA230,252,230,252,160,177,251
1640 DATA45,13,3,24,109,89,3,24
1650 DATA145,251,96
1660 DATA173,101,3,201,1,240,6,165,252
1670 DATA24,105,92,24,144,6,165,252
1680 DATA24,105,216,24,133,252
1690 DATA173,89,3,45,251,96
1800 DATA165,254,24,105,32,24,133,254
1810 DATA160,173,22,208,41,16,201,1
1820 DATA208,9,165,252,24,105,92,24
1830 DATA24,133,252,96
1840 DATA173,96,3,201,1,208,1,96,201,3
1850 DATA208,1,96,165,252,24,105,4,24
1860 DATA133,252,96
2000 DATA173,103,3,201,1,240,40
2010 DATA173,102,3,201,1,240,8
2020 DATA169,255,24,237,97,3,141,104,3
2030 DATA160,177,253,24,45,104,3,24
2040 DATA145,253,96,160,177,253,24
2050 DATA13,97,3,24,145,253,96
2060 DATA160,177,253,24,77,97,3,24
2070 DATA145,253,96
2100 DATA173,97,3,18,24,109,97,3,24
2110 DATA141,104,3,173,103,3,201,1
2120 DATA240,9,160,177,253,77,104,3
2130 DATA24,96,160,169,255,24
2140 DATA237,104,3,24,141,104,3
2150 DATA173,89,3,201,1,208,9,177,253
2160 DATA45,104,3,24,145,253,96
2170 DATA201,1,208,13,177,253
2180 DATA45,104,3,24,109,97,3,24
2190 DATA145,253,96,201,2,208,16
2200 DATA14,97,3,177,253,45,104,3
2210 DATA24,109,97,3,24,145,253,96
2220 DATA173,97,3,14,97,3,24,109,97,3
2230 DATA24,141,97,3,177,253,45,104,3
2240 DATA24,13,97,3,145,253,96
2300 DATA173,89,3,141,105,3
2305 DATA173,89,3,141,99,3,173,92,3
2310 DATA201,1,208,9,173,93,3,55
2320 DATA23,64,144,1,96,24,173,94,3
2330 DATA56,233,200,144,1,96,24
2340 DATA169,141,88,3,173,22,208
2350 DATA41,16,201,1,208,6,32,60,192
2360 DATA24,144,8,32,192,169,1
2370 DATA41,88,3,32,112,192
2380 DATA32,161,192,32,190,192,173,181,3
2390 DATA201,1,240,3,32,132,193,32,232,192
2395 DATA173,105,3,141,89,3
2400 DATA173,88,3,201,1,240,4,32,242,193
2410 DATA96,32,183,193,96
2499 REM### CLS
2500 DATA169,32,162,64,172,101,3,192
2505 DATA240,6,162,96,169,64,160,133,252,169,3
2510 DATA13,251,168,145,251,208
2520 DATA208,251,230,252,228,252
2530 DATA208,245,169,4,162,7,172,101,3
2535 DATA192,240,6,162,99,169,96,160,
2540 DATA133,252,173,3,208,145,251,208
2550 DATA208,251,208,208,228,252
2560 DATA208,245,180,252,169,232
2570 DATA13,251,160,24,173,3,208,145,251
2580 DATA208,208,251,169,216,133,252
2590 DATA162,220,169,168,133,251
    
```

```

2500 DATA145,251,208,208,251,230,252
2610 DATA228,252,208,245,96
2699 REM### LINE ###
2700 DATA173,60,3,205,63,3,240,30,169,1
2710 DATA141,79,3,205,68,3,240,3,169,6,3
2720 DATA141,77,3,141,78,3,96,169,9
2730 DATA141,77,3,169,3,141,73,3,96
2740 DATA173,61,3,205,64,3,208,14
2750 DATA169,255,141,79,3,169,6
2760 DATA141,77,3,141,78,3,96,169
2770 DATA141,79,3,173,61,3,56,237,64,3
2780 DATA144,12,24,169,9,141,77,3,169,3
2790 DATA141,78,3,96,169,6,141,77,3
2800 DATA141,78,3,96
2900 DATA162,172,77,3,189,60,3
2910 DATA153,60,3,208,232,224,3,208,244
2920 DATA162,172,78,3,189,63,3
2930 DATA153,63,3,208,232,224,3,208,244
2940 DATA173,79,3,201,1,240,17,169
2950 DATA141,74,3,173,70,3,56,237,67,3
2960 DATA24,141,75,3,96,169,1,141,74,3
2970 DATA173,70,3,56,237,67,3,144,5
2980 DATA24,141,75,3,96,206,74,3,24
2990 DATA141,75,3,96
3000 DATA173,71,3,205,68,3,208,11,169
3010 DATA141,75,3,169,2,141,86,3,96
3020 DATA56,237,68,3,24,141,76,3
3030 DATA173,71,3,56,237,68,3,144,7,24
3040 DATA169,1,141,80,3,96,169,56
3050 DATA237,76,3,24,141,76,3,169
3060 DATA141,80,3,96
3100 DATA173,80,3,201,2,208,6,169,1
3110 DATA141,81,3,96,173,74,3,201,1
3120 DATA208,6,169,1,141,81,3,96
3130 DATA173,75,3,56,237,76,3,144,7,24
3140 DATA169,1,141,81,3,96,169
3150 DATA141,81,3,96
3200 DATA173,84,3,24,109,75,3,144,20,24
3210 DATA141,84,3,169,238,83,3
3220 DATA205,83,3,208,9,238,82,3,24
3230 DATA144,3,141,84,3,173,83,3,24
3240 DATA109,74,3,144,4,24,238,82,3
3250 DATA141,83,3
3255 DATA96
3260 DATA173,87,3,24,189,77,3,144,4
3270 DATA24,208,68,3,141,87,3,173,86,3
3280 DATA24,189,76,3,24,141,86,3,96
3300 DATA173,87,3,56,237,77,3,176,3
3310 DATA206,86,3,24,141,87,3,173,86,3
3320 DATA56,237,76,3,24,141,86,3,96
3400 DATA173,75,3,201,1,208,9,141,74,3,169,1
3410 DATA141,76,3,96,160,140,112,3,173,76,3,170
3420 DATA24,109,76,3,144,249,24,238,112,3,170
3430 DATA173,112,3,56,237,75,3,176,4,138
3440 DATA24,144,231,24,234,140,75,3,169,1
3450 DATA141,76,3,169,141,74,3,141,77,3,96
3500 DATA162,173,76,3,201,1,208,9,141,77,3,169,1
3510 DATA141,74,3,96,160,140,112,3,173,73,3
3520 DATA201,1,208,2,162,1,173,75,3,208,24
3530 DATA109,75,3,144,15,238,112,3,172
3540 DATA173,112,3,56,237,76,3,176,22,104,224,1
3550 DATA208,230,238,112,3,72,173,112,3,56
3560 DATA237,76,3,176,4,104,24,144,213,24
3570 DATA234,104,140,77,3,169,1,141,74,3,169
3580 DATA41,75,3,141,76,3,96
3799 REM### MAIN LINE
3800 DATA32,66,195,32,161,195,32,246,195
3810 DATA32,49,196,178,66,3,141,82,3
3820 DATA173,67,3,141,83,3,173,68,3
3830 DATA141,86,3,169,141,84,3
3840 DATA141,85,3,141,87,3,141,88,3
3850 DATA173,22,208,41,16,201,240,5
3860 DATA169,1,141,88,3,173,74,3,205,76,3
3864 DATA208,27,173,75,3,205,77,3,208,19
3866 DATA169,141,75,3,141,77,3
3868 DATA141,76,3,169,1,141,74,3
3869 DATA24,144,1,1
3869 DATA173,81,3,201,
3870 DATA208,6,32,202,196,24,144,3
3880 DATA32,14,137,24,173,83,3,141,93,3
3890 DATA173,82,3,141,92,3,173,86,3
3900 DATA141,94,3,32,105,194,173,97,3
3905 DATA141,112,3,32,172,199
    
```

## COMMODORE 64 PROGRAMMING

```

3910 DATA173,81,3,201,,240,3
3920 DATA76,196,198,173,80,3,201,,240,3
3930 DATA76,47,199,76,102,199
4000 DATA173,82,3,141,92,3,174,83,3
4010 DATA32,97,196,173,83,3
4020 DATA236,83,3,208,1,96,141,93,3
4030 DATA78,97,3,24,173,97,3,201,
4040 DATA208,27,169,128,141,97,3,165,253,24
4050 DATA105,8,144,3,24,238,254,133,253
4060 DATA230,251,165,251,201,
4070 DATA208,2,230,252,96
4100 DATA173,86,3,141,94,3,32,146,196
4110 DATA173,86,3,205,94,3,208,1,96
4120 DATA141,94,3,41,7,201,,240,3
4130 DATA230,253,96,165,251,24,105,40
4140 DATA144,3,24,230,252,133,251
4150 DATA165,253,24,105,57,144,3,24
4160 DATA230,254,230,254,133,253,96
4200 DATA173,86,3,141,94,3,32,174,196
4210 DATA173,86,3,205,94,3,208,1,96
4220 DATA141,94,3,41,7,201,7,240,3
4230 DATA198,253,96,165,251,56,233,40
4240 DATA176,2,198,252,24,133,251
4250 DATA165,253,56,233,57,176,2
4260 DATA198,254,24,198,254,133,253,96
4300 DATA160,,32,43,198,173,93,3,24
4310 DATA105,1,144,4,24,238,92,3
4320 DATA141,93,3,173,80,3,201,1,208,6
4330 DATA32,82,198,24,144,3,32,139,198
4340 DATA173,94,3,201,255,208,1,96
4350 DATA201,200,208,1,96,173,92,3
4360 DATA201,,240,8,173,93,3,201,64
4370 DATA208,1,96,192,1,240,13,200
4380 DATA173,22,208,41,16,201,,240,3
4390 DATA76,198,198
4400 DATA32,157,199,32,200,194,173,92,3
4410 DATA205,69,3,208,9,173,93,3
4420 DATA205,70,3,208,1,96,76,196,198
4500 DATA238,94,3,173,94,3,32,103,198
4510 DATA32,19,198,173,94,3,201,255
4520 DATA208,1,96,201,200,208,1,96
4530 DATA173,92,3,201,,240,8,173,93,3
4540 DATA201,64,208,1,96
4550 DATA32,157,199,32,200,194
4560 DATA173,94,3,205,71,3,208,202
4570 DATA96
4600 DATA206,94,3,173,94,3,32,160,198
4610 DATA32,19,198,173,94,3,201,255
4620 DATA208,1,96,201,200,208,1,96
4630 DATA173,92,3,201,,240,8,173,93,3
4640 DATA201,64,208,1,96
4650 DATA32,157,199,32,200,194
4660 DATA173,94,3,205,71,3,208,202
4670 DATA96
4700 DATA160,,177,251,45,95,3,24
4710 DATA109,89,3,24,145,251,96
4720 DATA173,22,208,41,16,201,,208,30
4730 DATA173,90,3,201,,208,6,169,240
4740 DATA141,95,3,96,173,89,3,10,10,10
4750 DATA10,24,141,89,3,169,15,141,95,3
4760 DATA96,173,90,3,201,,240,11,201,2
4770 DATA240,222,201,1,208,218,24
4780 DATA144,221,169,255,141,95,3,169,
4790 DATA141,89,3,96

```

Program 2 — the BASIC program. Type NEW after entering Program 1, then key in Program 2, SAVE, the RUN

```

9 REM*DEMONSTRATION PROGRAM*
10 V=53248
19 REMGET INTO MODE*
20 POKEV+24,31:POKEV+17,PEEK(V+17)OR32
29 REM*CL*
30 POKE869,0:SYS49879
39 REM*POINT*
40 POKE858,1:POKE857,5
50 POKE870,1:POKE871,0
100 FORN=0TO199STEP2
110 X=N:Y=100-90*SIN(N/50,929)
120 POKE860,X/256:POKE861,XAND255:POKE862,Y
130 SYS49769
140 NEXT
199 REM*LINE
200 FORN=0TO199STEP4
210 POKE828,0:POKE829,10:POKE830,100
220 POKE831,1:POKE832,10:POKE833,N
230 POKE857,7:SYS50544
240 NEXT
250 POKE871,1:POKE858,0
260 FORN=0TO199STEP4
270 POKE828,1:POKE829,10:POKE830,100
280 POKE831,0:POKE832,10:POKE833,N
290 POKE857,2:SYS50544
300 NEXT
399 REM*BACK TO NORMAL*
400 GETA#:IFA#=""THEN400
410 POKEV+17,PEEK(V+17)AND223
420 POKEV+24,21

```



KEMSOFT Software FRACTIONS 1 ZX Spectrum 48K KEMSOFT Software GEOGRAPHY 1 ZX Spectrum 48K

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### Micro Tip

Oric

### Make a hi-res window

This short routine enables you to put a high resolution window on to the text screen.

One application of this would be to create multi-coloured characters, by putting the left-hand attribute column into hi-res.

It's not a good idea to use the lower half of the screen for hi-res, since this contains the character set while in text mode.

Steven Green

**Quadrablitz  
TI-99/4A £6**

Stainless Software, 10 Alstone Road, Stockport, Cheshire

Quadrablitz is a reproduction of the traditional game of Bagatelle, with four different variations.

The first game is called Mine-Field. First of all, the deflector is positioned, then the strength of the shot is chosen and the ball is fired.

When the ball rebounds from the deflector, it moves across the screen and explodes any mines which it hits. Each round consists of five shots and each shot ends when the ball hits the bottom of the screen.

In game two, Colour-Connect, bollards of the same colour have to be hit in sequence.

In the third game, Pin-Ball, the ball has to be deflected to hit pins. Game four, Breakthrough, is a combination of Mine-Field and Pin-Ball, the only difference being that the pins don't score points. They just deflect the ball, hopefully, onto the mines.

A nice feature of the program is a Medley option, which enables the player to play one round of each variation.

This game is not really for those who like fast action, but may suit you if you enjoy a more leisurely pace.

instructions	80%
playability	60%
graphics	90%
value for money	70%



# The perfect partner?

**Do people laugh at you when you play snooker? Does your bridge game leave a little to be desired? Your micro can make a sympathetic partner — with the right software**

**Knockout  
Spectrum 48K  
£6.95**

Mikrogen, 24 Agar Crescent, Bracknell, Berks

Knockout is an electronic version of shove-halfpenny, with all the good features of the original

game, but played on a course which doubles back on itself.

The clear instructions ask for the names of up to four players, and the crooked bowling alley which is the course then appears.

The players each have four balls which they play in turn, trying to leave them in the marked areas for the maximum score.

Like shove-halfpenny, balls already played may be hit to

change their scores or pushed off the course.

A prompt appears to tell you when it's your turn, and you set up the starting position, direction and strength of throw.

The ball then hurtles down the course, bouncing and scattering other balls with great realism.

Four balls each player makes a frame, and up to nine frames a game. The score, ball and frame:

numbers are displayed during play and after each frame.

This is an excellent game, simple but very good fun to play.

instructions	80%
playability	90%
graphics	70%
value for money	70%

**Snooker  
32K BBC £7.95**

Visions, 1 Felgate Mews, Studland Street, London W6

This is the second Snooker program I've seen for the BBC machine, the other being Acornsoft's version.

There is no doubt that this is an excellent implementation of the game, with most of the features you would expect.

One advantage it has over Acornsoft's is the ability to practice on your own. This is useful, as finding another computer-crazy snooker enthusiast is not always easy!

It also has a foul ball feature which is missing from the Acornsoft version.

The use of keys or joystick is

common to both versions although I think the key layout is easier on this game.

I am certain that the selection of colours is much simpler, but the strength of shot is more difficult to control.

This is all well and good if the game is good and interesting, and it is.

The only quibble I do have is that the movement of the balls is a little less fluid than I would like. You can get the impression that you are playing Croquet, not Snooker!

instructions	70%
playability	80%
graphics	95%
value for money	80%

**Snooker  
CBM-64 £8.95**

Visions, 1 Felgate Mews, Studland St, London W6

The opening sentence in the program instructions says:— "Snooker (a load of balls) ... my words exactly."

The write-up on the inlay card would have me believe that the game is both fun to play and capable of teaching me more than a three-year course at the local poly. Having seen the program, I have to disagree.

The game comes with sufficient instructions to get you going. All aspects of play are covered.

You may play a one or two player game and use either 10 or 15 red balls. Once this has been selected you position the white ball and start playing.

The game has features for

changing the screen colours, aborting the game, deleting balls during play, specifying colours, adding spin to the ball and selecting the power level.

All these features would be nice on a good version of snooker but this game hardly constitutes such a description.

The graphics are slow, flicker, and are wildly inaccurate. A lot of control over nothing leaves you with nothing, as this game demonstrates.

This game is just another version of snooker on a computer. There's nothing much going in its favour, because the game is so inaccurate.

instructions	60%
playability	35%
graphics	45%
value for money	35%

**Bridge Player  
48K Spectrum  
£8.95**

CP Software, 17 Orchard Lane, Prestwood, Great Missenden, Bucks

It's many years since I last played bridge, mainly because I could never find a partner who would tolerate my indifferent play. At least, I have a partner that

only puts up with bad play, but doesn't drink my whisky!

For those of you who understand such things the inbuilt bidding system is ACOL, but if you open using either Stayman or Blackwood conventions, then the computer will respond accordingly.

After the cards have been dealt you have two options. Option 1 is the normal bridge game in which you are South, and dealing is rotated as normal.

Bidding is exactly as the normal game, though if you underbid you may be told that you and your partner have a majority of points. This leads to the option of either re-bidding, or abandoning the hand.

The second game option allows you to see all four hands, and you are given the opportunity to make one bid, and nominate the declarer. The option is then open to you to play all four hands, or just the declarer's and dummy's

hands, with the computer playing the defender's hands.

A very entertaining game, but it's not true that you can abandon the game during play, as the inlay states

instructions	100%
playability	100%
graphics	100%
value for money	100%





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## How it works

100-170 accepts data from keyboard regarding co-ordinates of flat shape. Sets up arrays in part

180-200 perform the calculations involved in setting up the z-axis co-ordinates and completing the working array

205 sets up a second array to store the original data

210-290 cause the figure to be displayed on the screen in hi-res mode

300-330 accept data regarding angles of rotation, in degrees, and convert this data into radians for the computer

340-450 draws the 3D representation after the various rotations have been calculated by the subroutines

455 & 460 reset the original co-ordinates and clears the graphic screen ready for another run through the turning procedure

The three subroutines adjust the screen co-ordinates of the specified points. Each subroutine deals with rotation in a different plane.

Although most people think of a prism as being a piece of glass of triangular cross-section the complete meaning of the word is any object which has a cross-section which remains constant throughout its length.

## Hints on conversion

The x and y co-ordinates of the VIC-20 hi-res screen are both 0-1023. Other configurations would still work.

The VIC screen is wider than it is high and the program makes corrections for this in line 1120 by multiplying by (7/10). A square screen format would require no such adjustment and other oblong formats would require different correction ratios.

Lines 210,290,345 and 460 set the graphic mode on the VIC with Super Expander and lines 270 & 440 mix text and hi-res on the screen. On other machines these lines will have to be altered.

This program allows the user to define a flat shape (square, oblong, triangle, hexagon etc.) and a length and then turn the prism so defined in any/all of three planes to get a three dimensional representation. It is written for the VIC-20 with Super Expander cartridge.

The plane figure which is to be the cross section of the prism must be defined in terms of screen co-ordinates (i.e. x=0 to 1023 & y=0 to 1023).

The fact that the screen is not square should be ignored when defining co-ordinates as correction is made in the program. You must, however, be careful to ensure that, during rotation, no co-ordinate will go beyond the limits of 0 and 1023. For example,

# Shapes you can see in 3D

You can create shapes on the screen and then see all three dimensions with J. D. Peel's program for the VIC-20 with Super Expander cartridge

```

100 DIM A(10,2):PRINT"Z":DIM B(10,2)
110 INPUT"NUMBER OF POINTS":N
120 FOR I=1 TO N
130 INPUT"X CO-ORD":A(I,0)
140 INPUT"Y CO-ORD":A(I,1)
150 NEXT I
160 INPUT"DEPTH":D
170 INPUT"PIVOT CO-ORDS(X,Y,Z)":P1:P2:P3
180 FOR I=1 TO N
190 A(I,2)=INT(P3+D/2)*A(I+N,0)+A(I,0)*A(I+N,1)+A(I,1)*A(I+N,2)+INT(P3-D/2)
200 NEXT I
205 FOR I=1 TO N#2:B(I,0)=A(I,0):B(I,1)=A(I,1):B(I,2)=A(I,2):NEXT I
210 GRAPHIC2
215 GOSUB 1000
220 POINT2 A(1,0),A(1,1)
230 FOR I=2 TO N
240 DRAW2 TO A(I,0),A(I,1)
250 NEXT I
260 DRAW2 TO A(1,0),A(1,1)
270 CHAR0,0;"HIT ANY KEY"
280 GET A$:IF A$="" THEN 280
290 GRAPHIC 0
300 INPUT"VERT TILT":T3
310 INPUT"HOR.ROT":T2
320 INPUT"SCR. PLANE ROT":T1
330 T1=(T1/180)*#:T2=(T2/180)*#:T3=(T3/180)*#
340 GOSUB 2000:GOSUB 3000:GOSUB 1000
345 GRAPHIC2
350 POINT2,A(1,0),A(1,1)
360 FOR I=2 TO N
370 DRAW2 TO A(I,0),A(I,1)
380 NEXT I
385 DRAW2 TO A(1,0),A(1,1)
390 DRAW2 TO A(N+1,0),A(N+1,1)
400 FOR I=N#2 TO N#N
410 DRAW2 TO A(I,0),A(I,1)
420 NEXT I
425 DRAW2,A(N#2,0),A(N#2,1) TO A(N+1,0),A(N+1,1)
430 FOR I=1 TO N:DRAW2,A(1,0),A(1,1) TO A(I+N,0),A(I+N,1):NEXT I
440 CHAR0,0;"HIT ANY KEY"
450 GET A$:IF A$="" THEN 450
455 FOR I=1 TO N#2:FOR J=0 TO 2:A(I,J)=B(I,J):NEXT J:NEXT I
460 GRAPHIC:GOTO 300
1000 REM**SCREEN PLANE**
1100 FOR I=1 TO N#2
1110 X#A(I,0)+P1:Y#A(I,1)+P2
1120 A(I,0)=(7/10)*INT(X#COS(T1)-Y#SIN(T1))+P1
1130 A(I,1)=INT(X#SIN(T1)+Y#COS(T1))+P2
1140 NEXT I:RETURN
2000 REM**HOR. PLANE**
2100 FOR I=1 TO N#2
2110 X#A(I,2)+P3:Y#A(I,0)+P1

```

if the length of the prism is set at 1000 and the z co-ordinate of the pivot point is 600 then a 90 degree rotation would move the whole face of the prism to 1100 — ie, off the screen — since the pivot point is not central.

**Example to run:** The program asks for x and y co-ordinates in turn after asking for the number of points to be defined. Try the following responses:

VIC prints	You type
NUMBER OF POINTS	4
X CO-ORD	300
Y CO-ORD	300
X CO-ORD	700
Y CO-ORD	300
X CO-ORD	700
Y CO-ORD	700
X CO-ORD	300
Y CO-ORD	700
DEPTH	500,500,500
PIVOT POINT(X,Y,Z)	400

You should obtain a square on the screen which can then be turned in any/all of three directions to obtain a 3D representation of a cube.

## Variables

In 3D work any point can be defined by 3 co-ordinates say (x,y,z). These co-ordinates are stored in two arrays A(N,2) and B(N,2).

N is the number of points specified and is input at the start of the program.

P1,P2 & P3 are the x,y,z co-ordinates of the chosen pivot point.

T1,T2 & T3 are the angles of rotation in the three planes.

X & Y are transient variables used during the actual rotation calculations.

```

2120 A(I,2)=INT(X#COS(T2)+Y#SIN(T2))+P3
2130 A(I,0)=INT(X#SIN(T2)+Y#COS(T2))+P1
2140 NEXT I:RETURN
3000 REM**VERT. PLANE**
3100 FOR I=1 TO N#2
3110 X#A(I,2)+P3:Y#A(I,1)+P2
3120 A(I,2)=INT(X#COS(T3)+Y#SIN(T3))+P3
3130 A(I,1)=INT(X#SIN(T3)+Y#COS(T3))+P2
3140 NEXT I:RETURN

```



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# Music while you work with the Beeb

Many computer programs particularly games, can be enhanced by the addition of some music. Some computers, when generating sound effects, however simple, will cause a halt or delay in the normal processing of the program.

With the BBC microcomputer's extensive sound handling features, however, it is possible to produce continuous music while the computer appears to process the main program.

It will seem that the computer is performing two tasks at the same time. This is untrue, of course, as the CPU can only handle one job at any one time.

Nevertheless, it is possible with some careful programming to produce an interaction between the sound processing and the main program processing.

## Program 1 — times each cycle of a loop

```
10 REM PROGRAM ONE
20 FOR loop=1 TO 15
30 TIME = 0
40 SOUND 1,-15,50+loop,20
50 PRINT "LOOP ";loop;" time ";TIME
60 NEXT loop
```

This article is not concerned with the production of sound effects using SOUND and ENVELOPE commands, as these have been well documented in other articles. I do hope to show you however, how you may use these musical effects to improve your game or other programs.

Each sound channel on the Beeb has a small area of memory allocated to it for use as a storage or buffer area.

When a SOUND command in BASIC is executed, it does no more than pass data relating to the sound effect into the buffer area. The sound is not actually activated by this command, but is taken care of by the CPU during interrupt periods when it services the sound generator chip.

If we try to pass a continuous stream of data into the sound buffer, we soon run into problems, as the storage area is very small and can only store data for five notes.

When the buffer becomes full, the BASIC interpreter cannot handle the situation, and it must therefore wait until space is available in the buffer. The program execution will therefore be suspended for a short time until each SOUND command can be executed.

To demonstrate how this situa-

**While Geoff Turner was writing our Rudolph's Nose program — it appeared in the Christmas issue — he developed a method to show graphics and play music simultaneously on the BBC micro. Here he expands on how it's done, with six programs to try**

tion effects the running of a program, enter and run **program 1**. This program is a simple loop which prints the time between each cycle of the loop.

You will see that for the first six cycles the time is very short and almost constant. However, in the seventh cycle the time is greatly increased because the sound buffer has become full and the program execution is delayed.

You may also notice that the shift lock light on your keyboard is flashing on. This is an indication that a buffer is full and program execution has halted.

Obviously this situation is unacceptable, particularly where

## Program 2 — machine code sub-routine

```
10 REM PROGRAM TWO
20 REM MACHINE CODE ROUTINE
30 P%=&D00
40 C
50 OPT 3
60 SEI
70 LDA #128
80 LDX #250
90 JSR &FFF4
100 STX &70
110 CLI
120 RTS
130 J
```

speed is an important factor in your game. To improve our program we need to examine the sound buffer to see if there is room for more data.

If space is available we can then execute a SOUND command. If the buffer is full then we bypass the SOUND command and resume normal processing.

If you are reasonably familiar with the BBC computer, it will come as no surprise to you to know that we can access one of the built in operating system routines to check the sound

buffer.

Unfortunately it is not possible to use \*FX 128 from within BASIC because \*FX may only be used to send information to the operating system.

If, as in this case, we require information back from the O.S. then we must use the equivalent OSBYTE call from within a machine code program. Don't worry if you have not yet mastered machine code on your Beeb, as we only need to use a very short routine which can easily be set up using the computers built in assembler.

**Program 2** is the machine code sub-routine. Those of you who are familiar with assembler language may skip this explanation of how it works.

Line 30 sets the variable P% to &DOO. This informs the assembler where it should place the machine code routine in memory. Having entered the assembler at line 40 we take OPT 3 which instructs the program to display the assembled listing and also report any errors.

When you are satisfied that the program works correctly then this can be substituted with OPT 0, (no error reports or listing). Line 60 disables interrupts to prevent data leaving the buffer whilst this routine is running. Line 70 loads the

## Program 3 — PROCEDURE to check and update sound buffer

```
10 REM PROGRAM THREE
20 REM PROC MUSIC
30 DEFPROC music
40 CALL &D00
50 IF ?&70 = 0 THEN ENDFPROC
60 SOUND 1,volume,pitch,duration
70 ENDFPROC
```

buffer status. We can use OSBYTE call 128 in our pro-

cedure to check and update the

accumulator with 128 and line 80 loads the X register with 250. These two values are then passed to the OSBYTE routine at address &FFF4. Note that the value 250 is relevant to sound buffer number one. A full list of values for other buffers is given on page 430 of the User Guide.

Having completed its interrogation of the sound buffer, the OSBYTE routine returns a value into the X register. Line 100 stores this value in location &70. The routine is terminated by the RTS instruction and line 120 returns us to BASIC.

When we wish to know the current status of the sound buffer, we can thus CALL the machine code at &D00 and then examine the contents of address

# BBC PROGRAMMING

&70. To enable continuous music in our programs, we must make regular checks on the buffer status.

The best way to accomplish this would be to write a PROCEDURE to check and update the sound buffer. Program 3 shows a suitable PROCEDURE. Assuming that the machine code has been assembled in an early section of the program then we can CALL the routine from within the PROCEDURE. Line 50 uses the indirect operator to check the contents of location &70.

If a value of zero is stored then there is no space in the buffer so the PROCEDURE is ended without further ado.

If, however, a value greater than zero is returned then space is available and the next note can be added to the buffer at line 60 before the PROCEDURE is terminated.

Program 4 — loops to call PROCmusic

```

10 REM PROGRAM FOUR
20 REM DELAYS AND LOOPS
30
40 REPEAT
50 X=X+1
60 PRINT X
70 PROCmusic
80 UNTIL X=20
90
100 FOR delay =1 TO 10
110 PROCmusic
120 NEXT delay
130
140 PRINT "PRESS SPACE BAR"
150 PROCmusic
160 IF NOT INKEY(-99) THEN 150
    
```

To ensure a continuous supply of data into the buffer, it is necessary to call PROCmusic at regular intervals. To a certain extent, this is largely a trial and error situation. Too many calls to PROCmusic will slow down the main program unnecessarily, whilst too few calls will result in gaps in the music.

As a general guide, PROCmusic must be called within any type of loop. Some examples are listed in program 4. REPEAT UNTIL loops and FOR...NEXT loops or any other kind of delay must always incorporate PROCmusic.

There is one occasion where the continuous flow of music will come to a grinding halt.

When an INPUT or GET statement occurs, program execution is halted until data is entered by the user. At this point it is impossible to call PROCmusic, and the buffer will

Program 5 — how to use INKEYS

```

10 REM PROGRAM FIVE
20 REM DEALING WITH INPUT
30
40 PRINT "ENTER NAME"
50 Name$=""
55 *FX15,1
60 REPEAT
70 I$=INKEY$(5)
80 PROCmusic
90 PRINT I$;
100 Name$=Name$+I$
110 UNTIL ASC(I$)=13
120 PRINT
130 END
    
```

eventually empty itself and the music will stop. To get around this problem avoid use of INPUT or GET in the program, and use

suitably short so as to prevent gaps occurring in the music. Using this method, the user may enter his name or indeed any

Program 6 — demonstration of combined music and graphics. The Tune Do Re Mi is played on three channels simulating piano, guitar and drums in harmony

```

10 REM MACHINE CODE
20 PZ=5000
30 (
40 SEI
50 LDA #120
60 LDX #250
70 JSR $FFF4
80 STX $70
90 LDA #120
100 LDX #251
110 JSR $FFF4
120 STX $71
130 LDA #120
140 LDX #249
150 JSR $FFF4
160 STX $72
170 CLI
180 RTS
190 J
200
210 REM READ IN MUSIC DATA
220 DIM P(56),D(56)
230 FOR I=1 TO 56
240 READ P(I),D(I)
250 NEXT
260
270 REM SET UP ENVELOPES
280 ENVELOPE 1,1,0,0,0,0,0,0,126,-4,0,0,126,100
290 ENVELOPE 2,1,0,0,0,0,0,0,126,-20,-20,-20,126,60
300 ENVELOPE 3,1,0,0,0,0,0,0,126,-10,-5,-2,126,126
310 I=0
320
330 REM GRAPHICS ROUTINES
340 MODE 2
350 REPEAT
360 FOR T=1 TO 50
370 PROCmusic
380 GCOL 0,RND(15)
390 MOVE 640,512
400 MOVE RND(1200),RND(1024)
410 PLOT 85,RND(1200),RND(1024)
420 NEXT
430 CLS
440 FOR T=1 TO 50
450 PROCmusic
460 GCOL 0,RND(15)
470 X=RND(1200):Y=RND(1024)
480 R=RND(300)
490 MOVE X,Y
500 MOVE X,Y+R
510 PLOT 85,X+R,Y+R
520 MOVE X+R,Y
530 PLOT 85,X,Y
    
```

other information into the program while the music continues to play.

Finally, program 6 demonstrates the effect by playing some music while a few graphic routines are executed.

In this demonstration program, three sound channels are used so it is necessary to check the status of all three buffers. The machine code routine is therefore extended to make three OSBYTE calls. In PROCmusic it is now necessary to make checks on three storage locations at &70, &71 and &72.

The data for the music consists of pitch and duration values for each note of the melody. These values are read into an array at lines 230 to 260 and are played in a continuous loop.

The graphics routines in program 6 are not synchronised in any way to the music.

The delay in INKEY should be

## BBC PROGRAMMING

```

540 NEXT
550 CLG
560 VDU5
570 FOR T=1 TO 100
580 PROCmusic
590 GCCL 0,RND(15)
600 MOVE RND(1200),RND(1024)
610 VDU 32+RND(93)
620 NEXT
630 VDU4
640 CLG
650 UNTIL FALSE
660
670 REM MUSIC PROCEDURE
680 DEFFROCMusic
690 IF INKEY(99) E=E+1
700 GALL $D00
710 IF 2&70=0 THEN 740
720 I=I+1:IF I=57 THEN I=1
730 SOUND 1,1,P(1),D(1)
740 IF 2&71=0 THEN 760
750 SOUND 0,2,12,10
760 IF 2&72=0 THEN 780
770 SOUND 2,3,P(1)-48,D(1)
780 ENDPROC
790
800 REM DATA FOR MUSIC
810 DATA 101,15,109,5,117,15,101,5,117,10,101,10,117,
20
820 DATA 109,15,117,5,121,5,121,5,117,5,109,5,121,40
830 DATA 117,15,121,5,129,15,117,5,129,10,117,10,129,
20
840 DATA 121,15,129,5,137,5,137,5,129,5,121,5,137,40
850 DATA 129,15,101,5,109,5,117,5,121,5,129,5,137,40
860 DATA 137,15,109,5,117,5,121,5,129,5,137,5,145,40
870 DATA 145,15,117,5,121,5,129,5,137,5,145,5,149,40
880 DATA 149,5,145,5,157,10,121,10,145,10,129,10,149,
30

```



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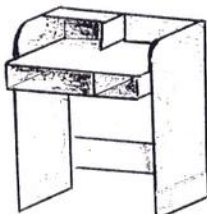
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## Battleships TI-99/4A £5

Stainless Software, 10 Alstone Road, Stockport SK4 5AH

I would think that just about everyone reading this has played Battleships at one time or another.

This computer version has all the ingredients of the game and

has been well programmed using good graphics.

The game can be set up to enable two players to participate or for one player against the computer.

You place your battleships on the board using the direction keys and the spacebar and the second player, or the computer, places their ships on a second board.

The players then take turns to locate and destroy their opponents' ships.

## Up Periscope Dragon 32 £6.95

Beyond, Competition House, Farndon Road, Market Harborough LE16 9NR

This game is certainly different, and should appeal to those with a leaning towards war and strategy games.

The aim is to get your convoy of ships, or as many of them as you can, through the enemy submarines and off the edge of the map.

You command either the convoy and destroyers or the subs, by moving pieces around a map as they did in operations rooms during the last war (if all the old films are to be believed).

The pieces are your fleet, and you have all the aids you need, including sonar, depth charges

and torpedoes to enable you to search out and destroy the enemy.

This doesn't mean that the game is easy. Even the well-written instructions take a long time to digest, and thinking in 3D as the submarine commander must do is very taxing.

But it's very playable — enjoyable to pit your wits against either another person or machine. The graphics are very clear and don't cause any confusion, and there is even a 'cheat' option for those getting too desperate to play to the rules.

This is definitely a thinkers' game, but should as the makers claim 'give a challenge which lasts for months not minutes'.

instructions	90%
playability	90%
graphics	90%
value for money	95%



## Battle Flight Oric 1 £4.95

Stour Computing, 16 Old Bridge Road, Bournemouth

In this Battle of Britain simulation, you are a Spitfire pilot.

The screen display is a plan view with 3D views for take-off, landing and aerial battles. You are flying over 900 square miles

somewhere near the Isle of Wight, represented by 42 screens — leave this area and you fly into fog.

There's an A4 sheet full of instructions, which unfortunately contain a lot of pilot's jargon. Most of this you can guess at, but some of it baffled me — what's 8 OCTAS, for instance?

Graphics are good, although a little more detail wouldn't go amiss. Your plane and the enemy plane are represented by two crosses — user defined graphics

would be better.

The instrumentation could be improved. Height, speed and what have you are represented by a number and identifying letter. This is OK when you're just flying about, because you have time to consult the instructions, but when you're locked in combat with the deadly birds, every second counts. The controls are set out rather oddly, too.

Use of sound is good, with realistic engine noises. Generally

good value, but too complicated for younger children.

instructions	60%
playability	90%
graphics	70%
value for money	98%



## UXB Dragon 32 £6.95

Virgin Games, 61-63 Portobello Road, London W11

As a bomb disposal officer, you must defuse an unexploded bomb using a number of menu-based choices and tools.

The wrong selection of any choice kills you instantly, but then the program relents and allows you to live again at the point before which you made the error, or to return to base to seek further advice.

UXB is written mainly in BASIC, and players with some programming ability can improve their chances of staying alive by examining the original listing.

The instructions were brief and somewhat confusing. The

program is mainly text, with only occasional high resolution graphics.

There is a spasmodic "out of memory" error which has the frustrating habit of occurring near the end of the game.

You will find UXB both intriguing and frustrating until you solve the de-fusing procedure.

It should pass an interesting evening for a moderately expert bomb disposal officer, but be warned that in your profession, careful thought is more important than a fast finger on the button.

I.S.

instructions	45%
playability	70%
graphics	60%
value for money	60%



The players can elect at the start of the game to play a set number of turns, where the winner is the one with the most hits at the end of the game, or to play until all of the opponents' ships have been sunk.

Battleships is a nicely laid out program with adequate instructions given on screen before the start of the game. Ideal for the

younger computer games player.

instructions	80%
playability	70%
graphics	70%
value for money	80%



## Falcon Patrol CBM 64 plus Joysticks £6.95

Virgin Games, 61 Portobello Road, London W12

You are a lone Harrier, with limited fuel to sustain you against two to four attacking fighters.

The graphics show about a quarter of the total playing area, with the rest displayed as a Defender-type radar display. Your remaining fuel is also shown, along with the remaining number of air-to-air missiles.

These two commodities can be replenished by landing vertically on a kind of landing pad. There are five or six of these in the area, but they are susceptible to being bombed by the opposition.

The enemy can of course shoot

back. When they hit you, there's a very good crash sequence showing your plane catching fire and dropping slowly to the ground to explode in a shower of flames.

The 3D display of the ground is good, too, with refuelling dumps, buildings, roads and of course the landing pads. Cars and lorries drive along the wrong side of the road, though, and petrol is called gas, hinting at American roots.

Sound effects make full use of the SID chip. Overall, this is one of the best games for the 64 that I have seen.

instructions	70%
playability	85%
graphics	97%
value for money	80%



## Armageddon Spectrum £5.95

Silversoft, London House, 271/  
273 King Street, London W6

Defend your six cities from missile attack and other nasties with your three missile bases.

Your target sight moves up and down with K and M; left and right with Z and X; Q, W, & E fire independent missile launch or L gives computer controlled launch. There is a 'hold everything' button and Kempston joystick facility.

The graphics are excellent — missiles come in fast and furious, planes, satellites and intelligent weapons abound and the explosion of your cities looks, and sounds, truly evil.

The controls respond so fast

that my non-dextrous fingers could not keep up so I engaged an expert.

He reports that it is the best and fastest game of this scenario that he has played and can he have it when I've finished with it — can there be any higher praise?

The only criticism I have is that the enemy weapons are listed under the heading of Strategic Air Defence on the cassette insert, which caused me a little initial confusion and a few burnt out cities.

But I think my expert friend may be disappointed — I'm getting better all the time and my country needs me. Highly recommended. D.C.

instructions	85%
playability	95%
graphics	95%
value for money	99%



## Alien Swarm/ Arena Spectrum £6.95

By Titan, from K-tel, 620  
Western Avenue, London W3  
OTU

In Alien Swarm, a swarm of mutant bees scrolls its jerky, flickering monochrome way down the screen towards your position. Why mutant, I hear you ask? Well brother, these bees fly backwards with no wings!

Accompanied by sounds which can only be compared with a small soggy balloon being released,

## Starclash Spectrum £6.95

Micromega, 230-236 Lavender  
Hill, London SW11 1LE

Another of the multitude of variations on space war, this program is not particularly exciting. But I suppose it's hard to come up with new ideas in this well tried area.

Alone in your new Starfighter, you are jumped by waves of alien ships of varying types. These are accompanied by bombs and meteors.

You must dodge left and right at the bottom of the screen, attempting to destroy each attack and graduate to the next.

If you do away with four types you face the mother ship — a

rather Chinese looking affair. Hit in the correct spot, it explodes and recharges your weapons system.

The sound and colour are fair, but the game is rather plodding and lacks real freshness. It operates smoothly enough and there are no complexities that require endless referral to instructions.

It is compatible with the Kempston joystick but runs well enough from the keyboard.

A personal vote of thanks to the suppliers for giving the reviewer an unlimited license version — a nice business courtesy. P.C.

instructions	95%
playability	70%
graphics	60%
value for money	60%



## Martian Attack 32K BBC £7.95

Micro Power, 8/8a Regent Street,  
Chapel Allerton, Leeds

The tape loaded perfectly to reveal a Martian night sky, a blood-red landscape and a solitary domed city.

You move your laser beam's cross-hair sights around the sky

and the landscape scrolls rather beautifully left and right across approximately three screen widths.

Movement is with the now standard Z, X, ; and / keys or you can use a joystick — which I preferred — but you may find yourself being rather hard on it as you drag it back to engage your force field.

Alien ships fly back and forth dropping bombs on the city. You really need to shoot each ship with

one or two shots to defer the onslaught.

If a ship passes your defences it comes back again, by which time another is already following and likely to be your downfall.

You never win, of course, and rarely get a second chance, so excitement and/or frustration can run high.

Constant use of the laser and force field depletes your energy.

It is fairly easy to lose a city, and although you get three lives I

# A bad attack of aliens

More monsters to fend off in these five action games. Our reviewers took them on and tried them out

they drone on until you get them, or they get you.

If you succumb, more rasping takes place, and a square spider's web blots you out.

If you win, then you have my commendation for stickability in the face of boredom.

The program appears to feature several levels, the next of which has non-animated crabs or scorpions or something, dropping undefinable lumps of crud upon you. But at this point I gave up.

To be fair, this is a good game concept. My nine year old son enjoyed it well enough, and in the hands of Ultimate, Imagine or Pison it could have been superb.

D.M.

instructions	95%
playability	95%
graphics	20%
value for money	30%



## Bat Attack CBM 64 £7.95

Alligata, 178 West Street,  
Sheffield S1 4ET

Bat Attack is an invaders type game that I found rather compulsive.

A nice point is that you can indicate whether you are using a black and white monitor or colour by pressing the B or C key. Unfortunately, though, the game does not take a joystick.

When you start to play your space vehicle emerges out of the ground with impressive sound effects. The invaders consist of several rows of bats that bomb you and/or swoop down onto you, again with good sound accompaniment.

If you manage to clear the screen of bats then you face an

army of large doughnuts that drop down out of the sky. You can't fire at these — you must just try to avoid them.

If you survive the doughnut attack you are then on the next level with a new wave of even more deadly bats.

The screen showed the score to date, the current highest score, the number of lives left (you start with three), and the level.

I liked this game and had a job to stop playing it so I could write this review. The sound effects added to the atmosphere — unlike many games, where the sound is an irritant.

L.C.

instructions	70%
playability	80%
graphics	70%
value for money	70%



can imagine interest waning quite quickly.

The game is well presented but with little to distinguish it. A high score is shown but no list of names — a disappointing neglect. I.W.

instructions	100%
playability	70%
graphics	80%
value for money	60%



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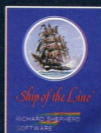
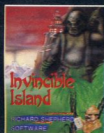
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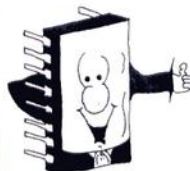
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DEALER ENQUIRIES WELCOME

# Collective efforts of the Salamander Six

As the home computer software market gets steadily slicker and more commercial, a lot of people in the software business are starting to feel that things ain't what they used to be.

The customer is getting a better deal, which can't be bad. But all too often professionalism is achieved at the expense of the friendliness and informality of the good old hobbyist days.

Brighton-based Salamander Software, best known for its Dragon charbusters such as Nightflight and Franklin's Tomb, is fighting a rearguard action against creeping formality.

The company is run as a collective, with the six partners each having an equal say in how the business is run.

As one partner, Chris Holland, put it: "There's no-one in charge, because we find we work best that way. We all muck in, and we're all capable of doing things in other fields."

"We don't actually employ anybody, and we don't intend to. People work with us on a contract basis — we even had a freelance secretary."

It helps that the Salamander six all know each other from the days when they were at Sussex University together, and a lot of their freelance help also comes from old college friends.

But this group of friends is lucky enough to combine most of the skills that a successful software company needs.

There's Pete Neale, a Texan, otherwise known as Pete the Hat (see picture), an ex-IBM mainframe programmer, and Lucy Parker, who did a course in design. Jul Carson also worked as a graphic designer, and Paul Kuczora used to be an electrical engineer. Pete Ohlson worked as a business systems programmer.

Chris Holland trained as a teacher and used to drive coaches around Europe. What's that got to do with software? Chris explained: "The others were looking for someone who was generally fed up with what he was doing, to take over the retail sales. And that was me".

Salamander first began selling programs just over a year ago, in September 1982. It all started because Pete Neale, who had just bought a Dragon, couldn't find any software for it. He decided to write some of his own, along the lines of the role playing games he'd been playing since he was nine.

**No-one's boss at Salamander Software, which is run jointly by its six partners. Candice Goodwin found out why they plan to keep it that way**

The programs started to sell well by mail order. In November '82 the first retail order came, from Anirog, and the High Street chains followed in spring 1983.

Over just a few months, the Salamander team found themselves shifting 50 to 70 times the number of tapes they had first started with, which meant a lot of hard work — regular 14-hour days, often seven days a week.

Everything from the programs themselves to the artwork for the cassette inlays and adverts was done in-house, and the team had to learn everything from scratch. "For example", said Chris, "We didn't understand about advertising copy dates, so first ads came out a month too early. Luckily, we've always got on well."

Salamander runs more smoothly now. The partners all have their own areas of responsibility. Pete Neale takes care of research and the company accounts. Paul Kuczora handles

marketing. Lucy Parker and Jul Carson are the art department. Pete Ohlson, who has just joined the company full-time, is projects director. And Chris Holland deals with retail sales in the UK and Scandinavia — it's him that drives around talking the shop into stocking Salamander software.

The company has two or three regular freelance programmers, but finds that a lot of good programs arrive through the post. Before any games are released on the public however, they are handed to Donald the Play Tester — an unemployed ex-student who, Chris says, "does the most mind-boggling things to games, and finds the most obscure bugs."

Salamander specialises in the Dragon mainly because that's the machine it started with. Chris Holland feels that "the Dragon does everything competently, and it does some things very well — if you dig deep enough, you can get

some very nice graphics from it. Its major limitation is its sound."

But he admits that "We were too late for the Spectrum market, where the turnover may be higher but the profit margins are much lower. But if a kid came to us and asked us to recommend a computer, we'd probably say, get a Spectrum."

The company has recently started to sell some BBC, Electron and Oric programs, and is now in the process of deciding whether to start supporting a new machine, and if so, which. As well as role-playing Franklin's Tomb and Castle Baron series, educational and utility programs, it sells some arcade games, including Dragon versions of Llamasoft's Gridrunner and Laser Zone.

Early next year it plans to release Rainbow Warrior, a machine-code arcade game for the Dragon, so complicated that it will need a 20-page manual to explain it.

But Chris says: "we feel that the arcade market is shifting away towards a more logical approach. Our classic game, Dragon Trek, has been around since the company started, and we're still selling 300 to 500 of them a month. Logical games last much longer."

"So at Salamander we're now moving towards good quality graphic and text games, where you have to use your head first — then move your hand."



Salamander's six partners: from left to right (top), Pete Ohlson, Pete the Hat, Chris Holland, (bottom) Jul Carson, Lucy Parker, Paul Kuczora

## Maths Invaders 32K BBC or Electron £7.95

Stell Software, 36 Limefield Ave, Whalley, Lancs BB6 9RS

At last, I can hear you yelling, something to make young Jimmy want to learn his tables and number bonds. If it has Space Invaders in it, he's bound to want to play it.

Well, perhaps he might, but I somehow doubt it. The aim is certainly there, and the idea is basically sound, but the program is so slow and boring that it really doesn't have that extra appeal.

And remember that the Electron runs slower than the BBC — so the problem will be even greater on that machine!  
The game has enough levels

and choices to suit a number of ability levels, but the game format is identical in each case.

The alien ships come (slowly) down the screen towards you while you manoeuvre your craft to shoot them down.

To do so you must first 'prime' the gun by pressing the numbers which form the answer to the particular problem posed on the ship's pointed nose.

If all is well, you obliterate that ship and proceed to the next. This then repeats until the sheet is finished or an alien ship lands. A great idea but poorly implemented.

instructions	75%
ease of use	60%
display	60%
value for money	50%



## Mr T's Shape Games 32K BBC £12.95

Ebury Software, 72 Broadwick Street, London W1

This has got to be one of the most attractive looking packages of software to cross my desk. The

glossy case opens to reveal a full colour parents' booklet, some stickers for the kids and the cassette hiding within — and if you'll take my advice, that's where it should stay.

For despite the superb presentation, the program is not worthy of the space it occupies.

There are in fact two programs, the first of them called Jigsaw.

# Hello, Mr Chips

## Will these programs do a good job of teaching your child, or is it the software companies that have something to learn?

Here you have a picture made up of shapes which you have to match with the shapes that fall down the screen. This is done by pressing the space bar when they are superimposed on the matching shape. Pressing the bar at any other time results in the usual 'raspberry' sound.

The whole thing is boring for even young children, because only the shapes used in the picture ever appear, only their exact match in shape and size, there are

never any mismatches seen!

The other program is a drawing package which builds pictures by putting shapes together.

instructions	70%
ease of use	50%
graphics	50%
value for money	20%



## Castle Spellerous 48K Spectrum £7.95

Sinclair Research, 25 Willis Road, Cambridge CB1 2AQ

The screen display shows a princess in a castle. One at a time, each word is flashed onto the screen and the child must type it back correctly.

This done, one of 10 soldiers starts to build a tower to rescue the princess. Get it wrong twice and the soldier is either zapped, or captured by a vampire.

Overall success brings the graphic rescue of the princess, fail and the wizard appears. In any event your ZX Printer prints a certificate with your score.

The program has 10 different sets of words, classified in "families". You can put your

own words into the relevant data statements.

Does seeing a word and typing it back constitute spelling? Not in my opinion. Spelling entails understanding word meaning in context and translating it into a written symbol, or hearing a sound, understanding meaning in context, recalling the written symbol, and transcribing it.

The meaning in context is vital if you are to differentiate between "stake" and "steak" for example. No meaning can attach to the words in this program. The program tests visual discrimination and short term memory only.

instructions	100%
ease of use	100%
display	90%
value for money	50%



## Lunar Letters Spectrum £7.95

Longman Software, Longman House, Burnt Mill, Harlow

After an over-long loading sequence, four star bases appear.

Pressing P brings a spacecraft onto the screen followed by five intrepid spacemen. The first man is "beamed" on board and a letter is "beamed" in each of the bases. The spaceman himself changes into one of those letters.

The idea is to steer the craft plus letter to dock with the base containing the same letter, using the cursor keys.

If the letters match, the ship returns to the home port and beams down the successful spaceman before picking up the next. When all five have

completed their mission they return to the ship and are carried home, ready to begin again.

The cursor controls are easy to operate, but are, I feel, expecting a bit too much from a young child.

Perhaps the program would be best suited to a child in the early school years who is having problems with letter recognition.

Alternatively it could be used by a younger child with parental involvement — a situation Longman quite rightly encourage with all their software.

An interesting program, full of colour, movement and sound. My three year old loved it!

instructions	95%
ease of use	85%
display	100%
value for money	90%



## Sums Are Fun/ Taking Away For Fun TI-99/4A £5

Stainless Software, 10 Alstone Road, Stockport, Cheshire, SK4 5AH

These two programs are designed to test the youngsters on simple addition and subtraction, but do

require adult supervision.

Sums for Fun has two difficulty levels, for whether your child is able to count up to 10 or 20, and progresses through three stages.

The child's name is entered, then he or she is asked if they would like to count in apples, lemons, cherries or oranges.

Five questions follow, illustrated by the graphic chosen. After each answer has been input the screen clears and a right, wrong or well done message

appears in large letters.

At the end of the round a score is given. Should this be satisfactory, further questions are provided in Stage 2. These are asked as sentences without the use of graphics.

A sufficient score after five of these questions begins Stage 3 where sums are given in the conventional  $A+B=?$  format.

Taking Away for Fun is similar, but questions are asked in only two stages.

The first offers graphics displays of ships, cars, fish or birds. The second uses conventional  $A-B=?$  subtraction, but does give a graphics illustration of how the correct answer is obtained, should the wrong one be entered.

n/a	
instructions	80%
ease of use	60%
display	60%
value for money	80%



# ANIROG SOFTWARE

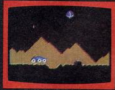
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# Fantastic voyages

**More strange locations to explore in these five adventure games. These are the tales our reviewers had to tell about them...**

## Zorgon's Kingdom VIC-20 plus 8K or 16K £9.99

Romik, 272 Argyll Avenue, Slough, Berks

Zorgon's Kingdom is a real time graphic adventure, loosely based on Donkey Kong. Playable with the choice of keyboard or joystick

controls, the keyboard was easier to use but the latter proved more successful.

As you guide your adventurer through five screens, you will encounter bouncing bombs, mutating octopi, electron bolts and many other hazards besides.

Six lives are available in order to allow you a chance to defeat Zorgon's minions and the evil devices. Only then will you be able to face the monster himself.

Unfortunately I found it

## Adventure- mania TI-99/4A £5.95

Intrigue Software, Cranbrook Road, Tenterden, Kent TN306UJ

This is a graphics adventure for the standard machine which not only provides a continual display of your status but shows a 3-dimensional outlook of your location.

Since the adventure is set in London, this includes some of the landmarks such as Trafalgar and Leicester Squares and the Strand.

You have a spectacular mission to accomplish, but you must first discover for yourself what this is.

The computer has been given a fairly limited vocabulary and your instructions are not input as complete words. The first three letters of the verb followed by the

first three of a noun, with no space between, is the only format accepted.

This takes some getting used to at first, but eventually you see the advantages of not having to type out long sentences only to be greeted by "do not understand".

Adventuremania is not a difficult game to play. Unlike some adventures your progress is not impeded by cryptic clues that take hours to unravel.

The game usually ends as a result of your own misfortune and at least if you don't manage to complete it you do have a score, given as a percentage, for consolation.

J.W.

instructions	80%
playability	75%
graphics	70%
value for money	85%



## The Kingdom of Klein 32K BBC £7.95

Epic Software, 10 Gladstone Street, Kibworth Beauchamp, Leicester

I was very interested to get my hands on this cassette, as one of the features it boasts is full sentence input.

This is a step forward in adventure game programming, which means that you can actually communicate your instructions to the machine in reasonable English, rather than in the stunted two word manner that most adventures understand and demand.

This game does have the feature. But it is of very little use, as the program often ignores the sense of the words, simply accepting the first word it understands — and there are

precious few of those, unfortunately.

So I was very disappointed before I really got going, and I haven't found much to excite me yet!

The game is obviously well structured but the descriptions are very short. I could find little to grasp on to and tended to wander around with very little idea of what to do next.

The game doesn't have a Help feature and doesn't use a split screen either.

I can therefore only conclude that this is a game for the experienced adventurer and not for the beginner at all. For adventure veterans, the game plays well but is rather un-

D.C.	60%
instructions	60%
playability	60%
graphics	n/a
value for money	50%



impossible to complete the fifth screen and so never had the pleasure of meeting the elusive Zorgon.

Between each screen there is a pause of about three minutes while the next screen is loading.

Overall this proved a very enjoyable and addictive game. The graphic and sound capabilities of the machine are used to the full.

I'd go so far as to say that it's probably one of the best games for the VIC-20 on release at present.

K.W.

instructions	90%
playability	100%
graphics	100%
value for money	100%



## Dark Lore 48K Spectrum £6.95

8th Day Software, 18 Flaxhill, Moreton, Wirral, Merseyside

Adventures form a popular and expanding division of the games program market. The rate of development in this area has brought considerable sophistication — the disciples of the adventure cult expect it.

But this program does not have what it takes — or at least what it may have to offer is lost in crude presentation. Money has even been poorly spent on a misprinted insert card. The loading logo is a poor advert, too.

A wide vocabulary is boasted, but it was very easy to build up a screenful of 'what did you say?' responses.

Even allowing for the reviewer's lack of experience in

these games some responses would be difficult to guess at for a hardened adventure buff.

I appreciate that learning by experience is the way of these games, but there was little encouragement to keep going.

Working purely from the location descriptions (no graphics) with no colour or sound and frustrating responses, tediously repeated, was hard going. The speed of execution was annoyingly slow.

100 locations are contained and the user would be wise to make maps and notes as advised. I was grateful for the hints sheet (available by SAE if you get desperate). Good intentions but uninspired presentation.

P.C.

instructions	70%
playability	50%
graphics	n/a
value for money	40%



## The Hobbit 48K Oric £14.95

Melbourne House, 131 Trafalgar Road, London SE10

Spectrum owners have enjoyed the Hobbit for some time and it has now been faithfully reproduced for the Oric.

For those familiar with other adventures, the Hobbit opens up totally new horizons. Interacting

characters ensure that you will never be certain of what is going to happen next.

You are Bilbo, and your mission is to recover the Dwarves' treasure, hoarded by the dragon Smaug, and bring it back to your home.

Your progress depends on your decisions, but the best hints are to be found by careful reading of the book itself.

All the favourite characters appear on your screen, and

pictorial representations of different scenes add to the realism.

Here I must mention the only significant criticism I can make and that is the irritating slowness in drawing some of the pictures.

You won't master the adventure for many weeks, but you can save the program at any stage.

The beauty of the Hobbit really lies in the interplay between the characters whether or not you are

present. It is certainly a superb adventure. You will be captivated, elated, frustrated but never bored.

P.S.W.

instructions	100%
playability	100%
graphics	80%
value for money	95%





# 48K SPECTRUM OWNERS *Read This From*

## ...LET'S GET DOWN TO BUSINESS...

### ★ ★ ★ FINANCE MANAGER ★ ★ ★

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These screens are just a sample to show the style of the program:

But that's not all, not by a long way. This program automatically raises a corresponding debit or credit for every entry, and will even open a new account if an entry features an unrecorded account name.



Information can be manipulated in various ways — you can call up your bank or credit card account, or analyse expenditure according to a variety of categories which you assign to the transactions. Instant Account balances can be listed at any time. A great time saving feature of this program is that account names and transaction descriptions need only be recorded **once**, as all the input fields will scroll existing files. There are many, many more features which make this the most powerful finance package around, we even include a test file for you to experiment with before getting started.

### ★ ★ ★ ADDRESS MANAGER ★ ★ ★

**ADDRESS MANAGER** utilises the same "on the page" presentation as **FINANCE MANAGER** and offers Spectrum owners a professional standard address filing, indexing and retrieval system. Below are examples of the screen presentations.

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# Put your foot down... but mind those trees

Although he's not old enough for a driving licence, Graham Simpson, aged 12, has produced a challenging driving game for the unexpanded TI-99/4A

You'll need all your driving skill as my game takes you on a forest rally.

Although the program uses just standard TI BASIC, it's a challenge to complete the course. How many miles will you complete before — crash!?

Although it has the same name, this is not the Forest Rally game in an earlier issue.

### How it works

10-300 sets up first screen  
300-500 sets up characters and colours  
510-560 move car  
600-730 reads data for course  
740-1920 data for course  
1930-1950 starts course again  
1960 end routine

### Variables

CO5 strings containing the forest course in the form of P1 to P100 DATA statements  
FAR distance in miles car has travelled (score)  
C gives position of car in screen column  
P provides next front of track to be printed

### Hints on conversion

**CALL CHAR** (ASCII code number, hexadecimal string) defines the pattern to be given to the character with the ASCII code stated

**CALL HCHAR** (row number, column number, ASCII code, number of repetitions) places character with ASCII stated, at row and column specified, and optionally repeats it horizontally the number of times stated

**CALL VCHAR** (row number, column number, ASCII code, number of repetitions) works in the same way as CALL HCHAR only repeats vertically

**CALL GCHAR** (row number, column number, numeric variable) equivalent of PEEK. Assigns ASCII code of character at row and column stated to numeric variable

**CALL CLEAR** clears the screen  
**CALL COLOR** (character set, foreground colour code, background colour code) specifies foreground and background colours for all characters in set specified

**CALL SCREEN** (colour code) specifies screen colour using colour code

**CALL SOUND** (duration, frequency, volume) produces sound. Duration in milliseconds, frequency in Hertz (or noise code), and volume in scale from 0 loudest to 30 quietest

**CALL KEY** (key unit,k,s) equivalent of INKEY\$, returns code of key pressed in variable k



```
10 DIM CO5(120)
20 CALL CHNR(121,"#####")
30 CALL CLNR
40 CALL SCREEN(5)
50 FOR CL=1 TO 16
60 CALL COLOR(CL,5,1)
70 NEXT CL
80 PRINT "##### "
90 PRINT "##### "
100 PRINT "##### "
110 PRINT "##### "
120 PRINT "##### "
130 PRINT "##### "
140 PRINT "##### "
150 PRINT "##### "
160 PRINT "##### "
170 PRINT "##### "
180 PRINT "##### "
190 PRINT "##### "
200 PRINT " * 1969 F0HRE5T RRLY * * * * *
210 PH
220 RESTORE
230 CH=1
240 FR=0
250 CALL CHNR(120,"3C4259H1E1942C3C")
```

```
250 PRINT " INSTRUCT(OH5-PR55) V"
270 CALL SCREEN(16)
280 CALL KEY(0,K,S)
290 IF S=0 THEN 260
300 CALL SOUND(400,600,0)
310 IF C<>"R" THEN 121 THEN 340
320 CALL CLNR
330 GOTO 2280
340 CALL CLNR
350 FOR CO=3 TO 9
360 CALL COLOR(CL,14,5)
370 NEXT CL
380 CALL SCREEN(4)
390 CALL CHNR(104,"161058067C71010")
400 CALL CHNR(112,"00007001005000")
410 CALL CHNR(33,"#####")
420 CALL CHNR(40,"000000110000000")
430 CALL CHNR(41,"000000000000000")
440 CALL CHNR(42,"000000240000000")
450 CALL CHNR(43,"000000510100000")
460 CALL SCREEN(9)
470 CALL COLOR(10,15,0)
480 CALL COLOR(2,7,1)
490 CALL COLOR(1,0,1)
500 CALL COLOR(11,5,0)
```

```
510 CALL KEY(0,K,S)
520 IF S=0 THEN 640
530 IF K=0 THEN 640
540 IF K=0 THEN 640
550 GOTO 640
560 C=C+1
570 CALL COLOR(12,C,GET)
580 IF C<>"3333" THEN 352 THEN 1940
590 GOTO 640
600 C=C+1
610 CALL COLOR(12,C,GET)
620 IF C<>"1333" THEN 352 THEN 1940
630 GOTO 640
640 CALL HCHAR(12,C,112)
650 CALL SCREEN(12,C,GET)
660 IF P=120 THEN 1930
670 RESTORE CO5
680 CALL HCHAR(12,C,35)
690 PRINT CO5(P)
700 IF C<>"3553" THEN 352 THEN 1940
710 PH=P+1
720 FR=FR+0.1
730 GOTO 510
```



Hi-Lo is a game of chance with cards in which you start with £1,000 and bet on the turn of nine cards.

You can gamble from £100 to £900 in hundreds or, by pressing A, you can risk all your money.

It is possible to turn your £1,000 into £512,000 if you double your money on the turn of each card.

**Hints on conversion**

If you convert the program for any other computer, take into account the following points:

- The text screen resolution is 32x16. The graphics work on a grid of 256x192. All the writing on the graphics screen is drawn. On most micros it can be PRINTED.
- The P MODE and SCREEN commands are used to switch from the text to the graphics screen.
- The DRAW command draws as directed by a string of instructions, e.g. U=up. This command also allows things to be scaled up or down by using "Sx" where x is the factor by which it is scaled. In this instance, a scale of four is normal size.
- The PAINT command fills an area of screen with a certain colour. The COLOR command changes the colour of the line command, which can draw lines, boxes and filled boxes.

Acce are classed as both low and high, so you can always win either of the cards is an ace. You

# Take your chances on the turn of a card

**You could win more than £17m or lose £1,000 in Ian Sellman's game. The program has been tested on a Dragon 32 and a 32K Tandy Colour Computer with Extended BASIC**

```

10 H0=1000
20 H0="THE COMPUTER"
30 REM=star*****
40 CLS
50 PRINT53,*****;
60 PRINT65,*****;
70 FORx=65TO449STEP32
80 PRINTx,***;
90 PRINTx+20,***;
100 NEXTx
110 PRINT617,*****;
120 PRINT649,*****;
130 PRINT6168,"higher or lower";
140 PRINT6220,*****;
150 PRINT6308,*****;
160 PLAY"V51CDEFBABA6GFED"
170 CLS
180 PRINT67,"HIGHER OR LOWER";
190 PRINT639,*****;
200 PRINT696," IN THIS GAME YOU HAVE TO BET ON IF THE
NEXT CARD IS GOING TO BE HIGHER OR LOWER THAN THE CARD
BEFORE IT. YOU CAN BET UP TO NINE HUNDRED POUNDS IN
    
```

```

HUNDREDS OR PRESS 'A' TOO PLAY FOR DOUBLE OR NOTHING. TH
E GAME ENDS WHEN EITHER YOU RUN
210 PRINT "OUT OF MONEY OR TURN OVER ALL TEN CARDS";
220 PRINT6440,"PRESS ANY KEY TO CONTINUE";
230 A$=INKEY$
240 IF A$="" THEN230
250 FOR x=490 TO202 STEP-32
260 CLS
270 PRINT6X,"GOODLUCK";
280 SOUND X/2,1
290 NEXTx
300 FOR x=1TO1000:NEXTx
310 CLS2
320 DIMZ(10)
330 DIM A(52)
340 DIM B(10)
350 DIM T(2)
360 TT=1000
370 GOTOT1200
380 REM screen set up *****
390 PMODE3,1:PCLS
400 PCLS2
410 LINE(5,5)-(251,187),PSET,B
420 POINT(0,0),4,4
430 DRAW"3BH4,4";
440 DRAW"CS"
450 DRAW"BM50,150:63:3RA45DBM7,+BR2L4R2U6R2L4R2BM7,+6R
2ELLRDL2U4R2F2BM4,+56R2CR4U30BM4,+BR4L4UR4L4UR4B
H4,+6LR3FDGL3FF3BH1,1,+BR3C3U4HL20DFBM7,+6UR6F3DGL3R
F3BR4SD,+BR4L4UR4B4,+6R2C4U4HL20DFBM7,+6R2F2U4BM4,4
,+6R4L4UR4L4UR4BM4,+6LR3FDGL3R
460 DRAW"FS"
470 DRAW"BM150,170C4BM3,+6UR2L4RM5,+6R2C4U4HL20DFBM
10,+6UR2L4RM4,+6UR2F2DGL3R4BM5,+3RA4L4UR4B4,+6"
480 RETURN
490 REM cards*****
500 CARDS="R40D60L40U60"
    
```

also win if the two cards are the same.

The program is fairly easy to change as it is a string of sub-routines linked together by a control routine.

You could, for example, alter the graphics and/or sound.

**Main variables**

- Card number of card being dealt with
- D used in FOR NEXT loops to create a delay
- HS holds highest score
- Stake holds your bet
- TT holds your total
- HSS stores name of holder of highest score
- A (52) array used to check that the same card is not used twice
- B (10) holds the 10 cards being used
- T (2) checks the two cards to see which is higher

Note: this program has been tested on both the Dragon 32 and the 32K Tandy Colour Computer with Extended BASIC.

**How it works**

- 10-20 sets highest score to 1,000 points gained by the computer
- 30-160 title page
- 170-240 instructions
- 250-300 PRINTS "good luck" on screen
- 310-370 DIMension arrays
- 380-480 set up graphics screen
- 490-530 draw outline of a card
- 540-590 deal card face down on screen using above routine
- 600-660 draw number and symbol on cards
- 670-1270 ask for stake
- 1280-1460 control routine which calls up required sub-routines
- 1470-1540 select cards at random and then check that they have not already been selected
- 1550-1640 ask for guess of either higher or lower
- 1650-1760 updates total, displays it on screen
- 1770-1910 computer decides if you are right or wrong
- 1920-1950 have you got highest score?
- 1960-2110 display scores, asks if another game is wanted
- 2120-2200 updates highest score
- 2210-2270 reset variable for next game



```

510 DRAW"BM"+STR$(X)+" "+STR$(Y)+"";C1+CARD#
520 PAINT(X+5,Y+5),1,1
530 RETURN
540 REM deal cards*****
550 FORV=25TO 75+25 STEP75
560 FORx=18TO225 STEP47
570 GOSUB490
580 NEXT x,y
590 RETURN
600 REM draw cards 11
610 IF CARD# = 1 THEN Z=0
620 Z=INT((CARD-1)/13)
630 IF Z=0 OR Z=1 THEN C=3 ELSE C=4
640 DRAW"BM"+STR$(X+20)+" "+STR$(Y+30)+"";C+STR$(C)+"S"
65"
650 D=CARD-Z*13
660 Z(T)=D
670 ON CARD-Z*13:GO TO 610,690,700,710,720,730,740,750,760,770,780,790,800
    
```

# DRAGON/TANDY COLOUR PROGRAM

```

680 DRAW"BM+2,+2L4UER2EUHL26BM+10,+5":RETURN
690 DRAW"BM-2,+1FR2EUHL2R2EUHL26BM+8,+5":RETURN
700 DRAW"BM+1,+2U663R4BM+4,+3":RETURN
710 DRAW"BM-2,+1FR2EUHL2R2EUHL26BM+4,+6":RETURN
720 DRAW"BM-2,+0ER2FDGL2HU4ER2FBM+4,+5":RETURN
730 DRAW"BM+0,+2U2E2U2L4BM+8,+6":RETURN
740 DRAW"BM-1,+2R2EUHL2HUER2FDGL26DFBM+7,+0":RETURN
750 DRAW"BM-2,+1FR2EU4HL26DFR3BM+4,+3":RETURN
760 DRAW"BM-2,+1FR2EU4H":RETURN
770 DRAW"BM-1,+2R2EU4HL26D4FBM+1,-2F2BM+7,+0":RETURN
780 DRAW"BM-2,+2U6BM+0,+3RE3G3F3":RETURN
790 DRAW"BM-2,+2U6ER2FDGL2HU4ER2FBM+4,+6":RETURN
800 DRAW"BM-3,+2U66BM+4,+1FR2EU4HL26D4":RETURN
810 DRAW"BM+0,-1FR2EU4HL26D4BM+8,+1":RETURN
820 DRAW"BM-1,+2U66BM+6,+5":RETURN
830 ON Z+1 GOTO 840,850,860,870
840 A$="DL2D3L2D2R3D2R2U2R3U2L2U3L2":GOTO880
850 A$="D6S5D2U2R4H4":GOTO880
860 A$="F5G5H5E5":GOTO880
870 A$="BM+2,+3H4D2F3H3U2G2F5E5H2D3U3G3":GOTO880
880 FOR# = 1 TO 2
890 IF A#1 THEN X1=X+7:Y1=Y+2
900 IF A#2 THEN X1=X+33:Y1=Y+48
910 DRAW"BM"+STR$(X1)+" "+STR$(Y1)+"C"+STR$(C)+A#
920 PAINT(X1,Y1+5),C,C
930 NEXTA
940 X=X+47
950 IFT=5 THEN X=10:Y=100
960 RETURN
970 REM ask for stake
980 DRAW"BM20,170 C3R4L4U3R4L4U3R4BM+4,+6U6DF4DU6BM+6,+
6U6L2R4BM+4,+6R4L4U3R4L4U3R4BM+4,+6U6R3FDGL3RF3BM+4,+0"
990 DRAW"BM+6,-1FR2EU4ER2FBM+6,+5U6L2R4BM+4,+6USER2FD5U
3L4BM+8,+3U6BM+0,+3RE3G3F3BM+4,+0R4L4U3R4L4U3R4BM+4,+6"
1000 IF TT=0 THEN 1960
1010 A$=INKEY$
1020 IF A$="" THEN 1010
1030 IF A$="A" THEN ST=TT/100:GOTO1100
1040 STAKE=VAL(A$)
1050 IF STAKE<1 OR STAKE>9 THEN SOUND1,10:GOTO 1010
1060 IF TT=0 THEN 1920
1070 IF STAKE<TT THEN GOTO1010
1080 SOUND200,5
1090 FORD=1TO100:NEXTD
1100 FOR F=1 TO 3
1110 SOUND150,1
1120 DRAW"C4BM20,180S4"
1130 IF A$="A" THEN GOSUB 790:GOTO1190
1140 ON STAKE GOSUB 820,680,690,700,710,720,730,740,75
0
1150 DRAW"BM+2,+0S4"
1160 FORD=1TO2
1170 DRAW"54BM+0,-1FR2EU4HL26D4BM+8,+1"
1180 NEXTD
1190 FORD=1TO200:NEXTD
1200 COLOR2,2
1210 LINE (10,174)-(90,185),PSET,BF
1220 FORD=1TO500:NEXTD
1230 NEXTF
1240 DRAW"BM150,60S4"
1250 COLOR2,2
1260 LINE(10,162)-(130,185),PSET,BF
1270 RETURN
1280 REM**control*****
1290 REM**sends program to sub routines
1300 GOSUB 1470
1310 GOSUB300
1320 GOSUB540
1330 SCREEN1,0
1340 GOSUB1650
1350 X=10:Y=25:T=1
1360 CARD=B(T)
1370 GOSUB600
1380 DRAW"S4"
1390 GOSUB830
1400 IFT=10 THEN GOSUB1770:GOTO1920
1410 IF TT<0 THEN 1920
1420 IF T<1 THEN GOSUB 1770
1430 GOSUB970
1440 GOSUB1550
1450 T=T+1
1460 GOTO1360
1470 REMcard select**
1480 FOR D=1TO10
1490 CARD=RND(52)
1500 IF A(CARD)=1 THEN 1470
1510 A(CARD)=1
1520 B(D)=CARD
1530 NEXTD
1540 RETURN
1550 REM**ask for guess
1560 DRAW"BM10,+2R3R4L4U3R4L4U3R4BM+4,+6U6DF4DU6BM+6,+
6U6L2R4BM+4,+6R4L4U3R4L4U3R4BM+4,+6U6R3FDGL3RF3BM+10,+0
S4C1U6R3R4U3D6BM+4,+0S4C3BM+7,+0R2EU4HL26D4FBM+7,+0U6R3
FDGL3RF3BM+10,+0S4C1R4L4U6BM+0,+6"
1570 A$=INKEY$

```

```

1580 IF A$="" THEN 1570
1590 IF AF<>"H" AND AF<>"L" THEN SOUND1,10:GOTO1570
1600 SOUND200,5
1610 COLOR2,2
1620 LINE(10,165)-(140,185),PSET,BF
1630 X=X+1
1640 RETURN
1650 REM**total***
1660 COLOR2,2
1670 LINE(150,172)-(245,185),PSET,BF
1680 DRAW"54C3BM160,180"
1690 A$=LEN(STR$(TT))
1700 FOR D=2TOA
1710 B$=MID$(STR$(TT),D,1)
1720 IF B$<>"0" THEN DRAW"BU2"
1730 ON VAL(B$)+1 GOSUB 810,820,680,690,700,710,720,730
,740,750
1740 DRAW"BR2"
1750 NEXTD
1760 RETURN
1770 REM**OR 1 *****
1780 FOR A=0TO1
1790 T(A)=Z(T-A)
1800 NEXTA
1810 IF T(0)=T(1) THEN W=1:GOTO1880
1820 IF T(0)=12 THEN W=1:GOTO1880
1830 IF T(1)=12 THEN W=1:GOTO1880
1840 IF T(0)=13 THEN IF T(1)<9 THEN W="H":GOTO1870 ELSE
W="L":GOTO 1870
1850 IF T(1)=13 THEN IF T(0)>9 THEN W="H":GOTO1870 ELSE
W="L":GOTO1870
1860 IF T(0)>T(1) THEN W$="H" ELSE W$="L"
1870 IF W$=X# THEN W=1 ELSE W=0
1880 IF W=1 THEN TN=ST*100 ELSE TN=0-ST*100
1890 TT=TT+TN
1900 GOSUB1650
1910 RETURN
1920 REM**check for high score
1930 FOR D=1TO100:NEXTD
1940 CLS
1950 IF TT>HS THEN 2120
1960 REM**end***
1970 CLS
1980 PRINT@10,"THE SCORES":
1990 PRINT@42,"*** *****":
2000 PRINT
2010 PRINT
2020 PRINT "THE TOP SCORE WAS GAINED BY-"
2030 PRINT " ";HS#,HS
2040 PRINT
2050 PRINT
2060 PRINT
2070 PRINT "YOU MANAGED TO SCORE",TT
2080 PRINT@449,"DO YOU WISH ANOTHER GAME (Y/N)":
2090 INPUTA$
2100 SOUND200,5
2110 IF A$="Y" THEN GOTO2210 ELSE CLS:END
2120 REM**high score***
2130 CLS
2140 PRINT@10,"HIGH SCORE":
2150 PRINT@42,"*** *****":
2160 PRINT@225,"YOU HAVE GAINED A HIGH SCORE PLEASE EN
TER THE NAME YOU WISH TO BE KNOWN BY (MAX 12 LETTERS)
":
2170 INPUTHS#
2180 HS=TT
2190 IF LEN(HS#)>12 THEN 2120
2200 GOTO1940
2210 REM**reset**
2220 CLS#
2230 PRINT@234,"WAIT":
2240 SCREEN0,1
2250 FOR X=1TO52:A(X)=0:NEXTX
2260 TT=1000
2270 GOTO370

```

## Micro Tip

## TI-99/4A

### Checking out SAVE and OLD

I have a useful tip which concerns the TI's SAVE and OLD commands. If you type in OLD CSI and then decide to leave this mode, you can do so without turning the computer off by pressing E. Pressing E also allows you to leave the SAVE mode after typing in SAVE CSI. If you press C in either of these modes, you can check a program without having to enter the record mode first.

Austin Platt

# CHRISTINE COMPUTING

## TI 99/4A

### BLAST IT

Disarm bombs with a wire guided robot, bombs must be disarmed in order within a time limit. 5 levels of play, high score table.

£4.95

### CORE!

A three part game, move left and right as you descend through the clouds, birds and aeroplanes. On to the caves and caverns then through the 3-D maze to the Core.

£4.95

### FRUIT MACHINE

One arm bandit simulation featuring random hold, nudge and gamble. 'Reels' are fixed and can be learnt but motion is random.

£4.95

### UFO

Blast the aliens as they appear from hyper-space, features 3 levels of play, refuel etc.

£4.95

### SPUDZ

Score points as you collect potatoes without getting caught in the shadow cast by the setting sun or falling into your trench.

£4.95

## COMMODORE 64

### MUNCHER

100% machine code game making good use of the sound and graphic facilities of the 64. Munch your way around the maze avoiding the ghosts, etc.

£6.95

Send Cheques and Postal Orders to:

CHRISTINE COMPUTING, 6 FLORENCE CLOSE,  
WATFORD, HERTS WD2 6AZ  
Tel: Watford (0923) 672941

Please add 55p P&P per order.

## Volcanic Planet Spectrum £6.95

Thorn E.M.I., Upper Saint Martin's Lane, London WC2H 9ED

Addictive, exciting, fast moving, a very good game this.

Using either keyboard or joysticks you must manoeuvre around the mazes on various levels of the city of the Zeronis until you fund the volcanic plug on the lower level.

You plant a plasma bomb against this and then re-trace your steps to the surface before the subterranean metropolis is destroyed by a tide of molten lava.

Besides displaying the maze adjacent to you the screen shows the state of your life support systems and a map of the city level you are on, with a coloured cursor indicating proximity of a lift to take you to the next level.

You are able to destroy the Zeronis with your Fire Blaster but this is not necessarily a good idea because, understandably, the more of them you kill the more annoyed the survivors get.

The only snag was dragging myself away from the computer!

D.J.

instructions	90%
playability	95%
graphics	95%
value for money	90%



# The aliens are back

Keep off the encroaching extraterrestrial hordes in these action games. Our reviewers weigh them up

## Alien Break In 32K BBC £6.99

Romik, 272 Argyll Avenue, Slough, Berks

A typical space shoot-out game with a few novelties.

Using keyboard or joysticks, you must guard the earth from the Zargon fleet, consisting of

motherships, attack ships, diving ships, missiles and pods.

This gives you plenty to zap away at, and you can also dig holes in your defence wall to trap the falling pods before they mutate into indestructible motherships.

The graphics are well up to standard, with clearly-defined and easily-identified ships. The

speed of the ships is impressive, and the sound is good too.

During loading, there's a catchy little tune, which will never make the Top Twenty but passes the loading time. After about 10 or 20 loads, the tune really starts to grate on the nerves.

But that's a minor criticism of a

good-value game that's better than most.

J.H.

instructions	90%
playability	80%
graphics	90%
value for money	80%



## U.F.O. TI-99/4A £4.95

Christine Computing, 6 Florence Close, Watford, Herts

Your wits need to be as sharp as your reflexes when playing UFO. To save your city from certain destruction alien spacecraft must be shot from the skies.

The problem is that except for a few fleeting moments the UFOs are invisible, so their exact position must be committed to memory.

Your fighter travels across the screen. When you think the fighter is directly beneath a UFO you open fire with your lasers.

Falling to annihilate the alien causes part of your city to be destroyed, the game ending should your city become totally obliterated.

Your own spaceship has limited

resources: when fuel and laser energy need replenishing, it must be landed at the refuelling base.

Failing to refuel or making a crash landing brings the game to an end, whereupon the highest score is given.

There are three skill levels. At the easiest level there is only one UFO, at the next there is also a decoy, and at the third, two decoys.

The game is great fun and addictive to play. My only criticism is that the position of the UFOs hasn't been randomized, so after several runs you can easily remember where they are. J.W.

instructions	95%
playability	80%
graphics	80%
value for money	90%



## Dancing Monster CBM-64 plus joystick £5

Commodore, 675 Ajax Avenue, Slough Trading Estate, Slough  
Commodore have got to be insulting our intelligence by printing such simplified instructions with the game.

They seem to be making a song and dance about setting up your computer system. This I would expect in the CBM-64 user manual but not on software.

The game consists of a monster (to me it looks like a cross between an elephant and a grandad), which dances around the screen to some music.

The tune appears to be a down-graded version of 'In The Hall Of The Mountain King'. You must blast off parts of the monster with a cross-sight, controlled by the joystick.

The graphics are good, the monster can turn round and dance in various ways. One criticism here would be that the graphics are not smooth but jump from one position to another. Full use of colour is made.

The sound is good on the very fast level, which doesn't seem very hard to me. On the slower levels the sound slows down and is just a series of tones.

The game is not the kind of thing you'd want to play every day. I found that after 15 or so minutes of continuous play I was fed up with it.

My first thought was that it looked like a great party game — a friend of mine said exactly the same. K.I.

instructions	20%
playability	80%
graphics	70%
value for money	70%



## Super Meteors 48K Oric £6.95

Softek, 12/13 Henrietta Street, London WC2

A space game of the Asteroids variety.

You are in command of a space ship returning from hyperspace into the meteors. To protect yourself you need to blast the rocky lumps to smithereens with

your hyper-blasters.

Your ship can be rotated and driven forward by manipulating your thrust controls, and points are scored by hitting the various size meteors.

From time to time a space bandit will attempt to wipe you out and you need to exercise some skill to fend him off. If you do, then a fat bonus is of course clocked up.

The game is recorded in a rather clumsy way, involving loading

two successive files from tape. I am sure this could be tidied up considerably.

Part machine code, part BASIC, the action is quite smooth but suffers from a lack of colour.

Sound effects are reasonable but not particularly special, and the graphics are rather simple.

I was left with the feeling that this was a good start to a game that had not been properly finished.

If more variety and colour were available, it would be able to graduate from being just another game to something potentially very good. P.W.

instructions	85%
playability	60%
graphics	50%
value for money	50%



## She's 100 per cent...

Everywhere, I seem to read or hear people saying that girls are not interested in, or are not capable of, using computers.

In my computer studies class at school over half the pupils are girls. "Surprisingly", in last year's exams a girl got 100 per cent in her computer exam and, of course, was top of the class. This year she was top again, with 90 per cent, and achieved 85 per cent in her mock 'O'-level. The second and third places were also taken by girls.

Of course, not all the girls in my class are totally interested in computers, thus causing rumours that all girls are not "computer capable."

Now I think I might as well say, without boasting, that the girl mentioned before is... me!

I have my own ZX81 (wow!) and I am trying to start up my own software company, Eureka!, which will, hopefully, supply all those lonely "freaky" ZX81 users with useful and amusing games.

I think your magazine is excellent, being non-expensive (especially for unemployed schoolgirls!) and just about the only computer magazine that still prints listings for the ZX81.

If possible, could you try and print a ZX81 Pacman-type game?

Karen Oliver, aged 16, Romford, Essex

### ★ Software winner

We are sending you a copy of *Munchees*, *Quicksilver's* Pacman-type game for the 16K ZX81 — and not just because of your kind words about HCW! We would be glad to print this type of game for the ZX81 if one of our readers would like to submit a good original version.

And, if you're going on to 'A'-level, may we wish you the best of luck. You obviously don't need luck for the real 'O'-level...

## Circling around

Many thanks for the excellent VIC-20 program *Turning Turtle*, by Alan Wilburn, published in HCW 41.

Here is a routine for drawing circles using the program, which may be of interest to other readers:

```
10 VICPEN
20 DI = 47
30 FOR I = 1 TO 7
40 A = 76: B = 80
```

Send your letter to Letters, Home Computing Weekly, No. 1 Golden Square, London W1R 3AB. Don't forget to name your computer — the best letter could win £5-worth of software. Got a problem with your micro? We'll soon be starting a queries page, so send your technical questions to queries at the above address



50 FOR Z=0 TO 6.28  
STEP .03

60 X = COS(Z)\*DI + A: Y =  
SIN(Z)\*DI\*1.7 + B

70 PENX, Y

80 NEXT Z

90 DI = DI - 8

100 NEXT I

110 WAIT 198.7:SYS12

DI is the diameter of the circle to be drawn, A and B are the X and Y co-ordinates of the centre of this circle and lines 30, 90 and 100 cause seven circles to be drawn, the largest and smallest possible on the VIC screen with five in between as examples.

Could another reader please advise me how to erase only part of the drawing on the screen under program control or, alternatively, how to change the colour to enable this to be done?

G de Orfe, Chelmsford, Essex

## Alien lines

My Alien 2000 program for the Oric (HCW 40) appeared with a few lines missing. These are the lines to be added:

```
740 IF SCRN (A,P+1) = 37  
THEN EXPLODE :  
PLOT X,Y,"":GOTO  
960
```

```
750 IF P = 24 THEN 770
```

```
760 GOTO 700
```

```
770 REM = = =
```

```
POSITIONING OF
```

```
INVADER = = =
```

```
805 PLOT A,B,"#":P =
```

```
INT(RND(1)*20)+1
```

```
810 GOTO 50
```

Hamant Patel

## Hopping with dismay

Having become an addict of PSS's *Hopper* for the 16K ZX81, I was greatly dismayed to come across what I think are a number of bugs.

This happened when I was well on the way to a good score. I had completed the third screen and up flashed the score of just over 10,000 points.

I pressed the key to start the next screen but, instead of the game starting, the screen began to flash.

At first I thought it must be RAM "white out". But this has now happened on a number of occasions. How maddening!

The other "bug" happens when the game is started and the frog is moved out into the lanes of traffic. If a key is then pressed the oncoming traffic will disappear as and when they come into contact with the frog.

Once a line of traffic has disappeared it will be gone until the next screen. This operation can be carried out on all the lanes of traffic.

Both this and the other "bug" mar an otherwise superb game.

Simon Haigh, Mirfield, West Yorks

John Fletcher, sales manager of PSS, said: "I am not aware of any bugs in this program. In fact, we have had a number of letters applauding it since it went on sale about 14 months ago, here and abroad."

"I would ask Mr Haigh to send the tape to our development and software projects manager, Campbell McCausland. It's just possible he's got a duff tape and we shall only be too happy to replace it for him."

Mr Fletcher said PSS had now ceased producing all its ZX81 tapes except three, in line with its policy of trimming out older products. All ZX81 cassettes except *Maze Death Race*, *Krazy Kong* and *MCCode* would now only be available by post.

## Leap of imagination

This is a special announcement to all you 48K Spectrum owners who are hooked on *Bug-Byte* and *Manic Miner*. Here follow details of a routine which enables you to jump to any screen in the game at will.

Load the game as usual, press ENTER to start the game, then enter the number: 6031769. A bee should appear in the bottom left hand corner.

You can now jump to any screen simply by pressing certain key combinations. You should use the number keys 1 to 6, and all combinations must include 6. The keys must be held down at the same time.

My congratulations to Bug-Byte for such an excellent game. How did they do it?

Carry on mining!  
G. Holding, Blackburn, Lancs



## BEST SELLERS

# Top 30

1	Manic Miner	Bug-Byte	Spectrum (5)
2	The Hobbit	M.House	Spectrum (4)
3	Valhalla	Legend	Spectrum (7)
4	Jetpac	Ultimate	Spectrum (4)
5	Hunchback	Ocean	Spectrum (-)
6	3D Ant Attack	Quicksilva	Spectrum (-)
7	Kong	Ocean	Spectrum (3)
8	Lunar Jetman	Ultimate	Spectrum (2)
9	Zzoom	Imagine	Spectrum (-)
10	The Hobbit	M.House	CBM 64 (-)
11	Hunchback	Ocean	CBM 64 (-)
12	Hunchback	Superior	BBC (-)
13	Felcon Patrol	Virgin	CBM 64 (-)
14	Horace goes skiing	Psion	CBM64 (-)
15	Harrior Attack	Durrel	Spectrum (-)
16	Frogger	Microdeal	Dragon (-)
17	The King	Microdeal	Dragon (21)
18	Cuthbert in the jungle	Microdeal	Dragon (24)
19	Atic Atac	Ultimate	Spectrum (1)
20	Skramble	Anirog	CBM64 (-)
21	Arcadia	Imagine	VIC 20 (-)
22	Kong	Anirog	CBM64 (-)
23	Hunter Killer	Protek	Spectrum (-)
24	White Knight	BBC Soft	BBC (-)
25	The Hobbit	M.House	Oric (-)
26	Chequered Flag	Psion	Spectrum (-)
27	Knife of Kishtu	Future	Dragon (-)
28	Chuckie egg	A&F	Spectrum (9)
29	Jetpac	Ultimate	VIC 20 (-)
30	Twin Kingdom Valley	Bug-Byte	Spectrum

Compiled by PCS Distribution(0254 691211) and sanctioned by the Computer Trade Association. Chart is for retail sales in individual outlets in the UK and Northern Ireland for the fortnight ended January 18

### Top Ten programs for the Dragon

1	Cuthbert goes Walkabout	Microdeal (1)
		Microdeal (9)
2	Frogger	Quicksilva (7)
3	Mined Out	Salamander (-)
4	Night Flight	Microdeal (2)
5	The King	Salamander (10)
6	Gridrunner	Hewson (6)
7	Dragonfly 2	
8	Ring of Darkness	Wintersoft (-)
9	Talking Android Attack	Microdeal (4)
10	Cuthbert in the Mines	Microdeal (-)

### Top Ten programs for the VIC-20

1	Arcadia	Imagine (3)
2	Wacky Waiters	Imagine (4)
3	Gridrunner	Llamsoft (5)
4	Catcha Snatcha	Imagine (2)
5	Wizard and the Princess	M.House (-)
		Quicksilva (6)
6	Skyhawk	Llamsoft (-)
7	Laser Zone	Llamsoft (-)
8	Matriz	
9	Superaiders/ Bomber Run	K-Tek (-)
		K-Tel(-)
10	Plague/ Alien Demon	

Compiled by Websters. Figures in brackets are last week's positions

### Top Ten programs for the Commodore 64

1	Frogger	Interceptor (1)
2	Crazy Kong	Interceptor (6)
3	Spritman	Interceptor (3)
4	Motor Mania	Audiogenic (5)
5	Laserzone 64	Llamsoft (-)
6	Purple Turtle	Quicksilva (10)
7	Attack of the Mutant Camel	Llamsoft (-)
8	Quintic Warriors	Quicksilva (-)
9	Hover Bover	Llamsoft (4)
10	Gridrunner 64	Llamsoft (8)

Compiled by Websters. Figures in brackets are last week's positions

### Top Ten programs for the Spectrum

1	Atic Atac	Ultimate (1)
2	Lunar Jetman	Ultimate (2)
3	Pyramid	Fantasy (5)
4	Alchemist	Imagine (-)
5	Ant Attack	Quicksilva (3)
6	Penetrator	M.House (-)
7	Death Case	Micro Mega (7)
8	Pool	CDS (10)
9	Jetpac	Ultimate (4)
10	Mr Wimpy	Ocean (-)

Compiled by W.H.Smith. Figures in brackets are last week's positions.

### Top Ten programs for the ZX81

1	Scramble	Quicksilva (5)
2	Defenders	Quicksilva (1)
3	Asteroids	Quicksilva (6)
4	Invaders	Quicksilva (2)
5	Chess	Sinclair (8)
6	Space Raiders	Sinclair (4)
7	Fantasy Games	Sinclair (-)
8	Chess 1K	Sinclair (-)
9	Krazy Kong	PSS (10)
10	English Lit II	Sinclair (-)

Compiled by Websters. Figures in brackets are last week's positions

# Do you use your micro?

A very legitimate study done for one of the best respected computing magazines over here shows that a surprising number of micro owners just aren't using their computers.

In a survey for InfoWorld, Link Resources revealed that of 2,000 personal computer owners (selected at random) in New York City, about 39 per cent of those who had purchased their machines in the last six months were not using them. Of all those who had owned their machines from six months to a year, 21 per cent were no longer using them. For those who had owned a machine longer than a year, the non-use figure fell to 17.

This seems to indicate to the surveyors that users were not sure what they would use their computer for at the time of purchase. Furthermore, amount of used was directly related to price. The more a computer cost, the more likely it was to be used. Only nine per cent of those who had paid over \$300 for their system let it sit idle, whereas 50 per cent of those who paid less than \$300 no longer used their system.

Apparently, the higher the cost of the system the greater its utility and the more software there is available. It turned out, unsurprisingly enough, that a majority of the machines not being used were low cost machines with little memory, lousy keyboards, no software, and offering no financial incentive to use them.

Such machines can be used to play games on, but not to learn how to program or learn on in an effective manner. In a follow-up in-depth survey of 100 owners, it was again found that the owners of more expensive machines were less likely to reject them. Only 19 per cent of Apple owners, 11% of Tandy owners, and 13 per cent of IBM PC owners had stopped using them. In comparison, 20 per cent of TI-99/4A owners and 30 per cent of Atari owners had stopped using their machines.

The conclusion drawn by the surveyors was not entirely negative. They concluded that many of those not using their cheapie machines had learned that such machines did not meet their needs and would end up buying more sophisticated systems when they could afford them.

In the meantime, the cost of learning this was not unduly expensive. The results of this survey have other implications, ones that we can read between the lines. It is clear that no one can define precisely what it is one should do with their home computer. This being the case, the average buyer/user is often at a loss when bringing the machine home.

If all you knew before buying a computer is their image on TV and in the movies (all-knowing all-powerful devices that respond to voice communication and are large and intimidating), and then you bring home your little box, you just might start asking yourself, as those folks did in New York: "This is a computer? How come it doesn't do anything?"

Don't ask me. I don't know either.

As a writer, whenever I encounter a new word processor, or the review of one, I devour it instantly. Very rarely do I ever get a chance to say anything about any of them, for most are designed to run on my Apple II or on other machines — none of which any of you reading this column are likely to own.

Well, this week I am pleased to report on one of the finest new products to come along, and one that runs on the VIC-20 or Commodore 64. It is called Quick Brown Fox.

It can run on either machine with unexpanded memory and can store and retrieve text files from either tape or disc. The program is menu-driven, and has three separate sections: editing, entry, and output. It can communicate over a modem. It can use embedded print formatting commands too, just as its more expensive competitors do.

On the VIC, it will take advantage of any 40 or 80 column display you might have, or it will just display in the standard 22-column mode. It comes in cartridge form, so you really need to use an expansion chassis on the VIC to get any real use out of the processor. The program will support most common printers without modification.

The only major drawback of the program is that you must enter the edit mode to make any changes in any other line of the text than the one you are currently working on. Since the editor is menu-driven, this can be a very slow process. The program handles errors very well, and is very difficult to crash. It will query any instructions that would result in the loss of text if executed. The documentation is well done, easy to follow and understand.

The program itself is easy to learn to use, if not as versatile as others. For home use, by non-professional writers, this might be just the ticket. The program lists for all of \$65, and is available from Quick Brown Fox, 548 Broadway, Suite 4F, New York, NY 10012. Phone: (212) 925 8290.



Here's some news about an interesting low cost printer. Just announced by Teletext Communication (TTX), of Foster City, the model TTX 1280 Portaprint is a truly remarkable portable dot-matrix printer. Weighing all of the unit will print bi-directionally, and will run on either a self-contained 6-volt battery or on the mains voltage. If on batteries, it will print at 40 characters per second rate, or 80cps on mains power. It comes compatible with either serial (RS-232) or parallel printer ports, and prints on thermal paper. It will print 40, 80, or 132 characters per line, or 72 by 72 dots per inch in graphics mode. It uses friction feed, and is nearly silent. Battery life is reported to be about two hours or 4,000 to 5,000 print lines. The firm is expecting to sell a lot of these units at only \$199 list price each. Look for them in the stores by the middle of this year.



Coals to Newcastle Division, Thought You'd Be Interested Dept. Now that TI has dropped out of the small home computer race, a lot of people in the industry are of the opinion that it may be quite difficult to introduce a successful home computer unless it is IBM PCjr. compatible.

Tano Corp., of New Orleans, thinks otherwise. In what many consider to be a bold, if not reckless move, Tano had decided to import a U.S. version of the Dragon 64, which has just gone on sale in the U.K. Tano firmly believes they will be successful too because they are throwing in about \$150-worth of free software to purchasers of the \$399 machine, and also because they will offer free training to the stores carrying the machine.

To accompany the machine, the firm is throwing in free a mailing list program, a spreadsheet program, a database program, two adventure games, two educational games, and Microsoft Extended Colour BASIC, along with a line editor. Tano is also offering a disc system for \$399. The Dragon will be able to display nine colours on American TV screens.

What will undoubtedly help sales is the fact that the unit is so compatible with Tandy's Colour Computer. It will run about 98 per cent of all software made for the Tandy. It certainly has a much better keyboard, being essentially modelled off the IBM Selectric layout. Not only that, but Tano itself is releasing about 60 additional software packages for the machine, about 20 per cent of which will be available on plug-in cartridges.

Tano is marketing the machine through major American retailers such as Macy's, Gimbels, and the Broadway chains. Store clerks are being trained how to run demo programs as well as how to run the bundled software programs. This alone should make a tremendous difference in sales.

If firmly believe that the market is there; it remains to be seen if anyone except Commodore and (presumably) IBM can truly capitalize on it.

See you next week, same place, same time.

Bud Izen  
Fairfield, California

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