Home Computing WEEKLY

An Argus Specialist Publication

More reviews . . . every week

No. 30
Sept 27-Oct 3, 1983

38p

Big value issue

PROGRAMS FOR:
Dragon, VIC-20, Spectrum, ZX81, Commodore 64

SOFTWARE REVIEWS FOR:
TI-99/4A, Spectrum, ZX81, Dragon, BBC, Commodore 64

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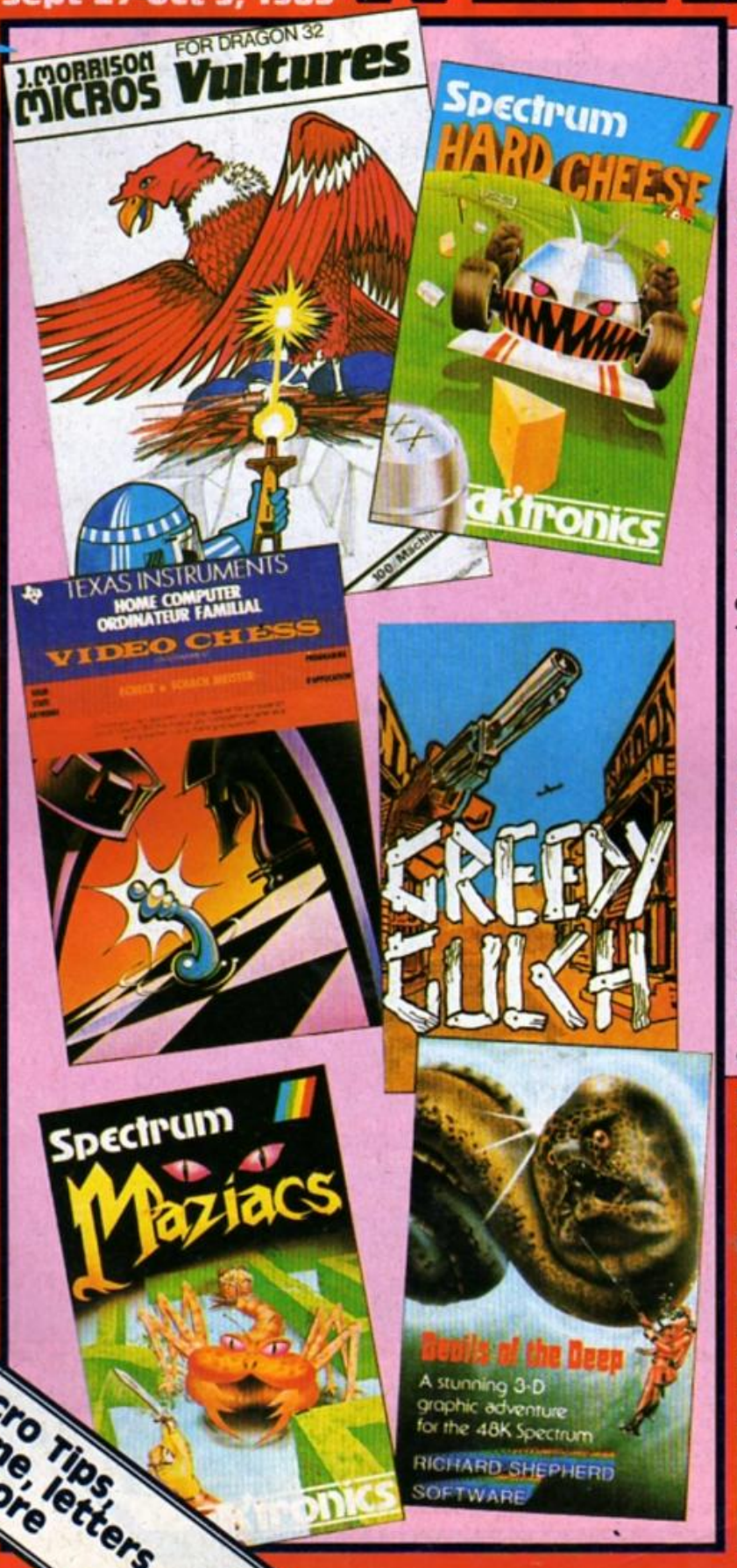

Sinclair micros may go on sale in China

Sinclair may soon be selling home computers to China — depending on the results of a small-scale trial there of the ZX81 and Spectrum.

The company recently announced that it had shipped small quantities of components for the two machines to China for local assembly and sale.

If these first few machines catch on, Sinclair will have the chance of shipping larger quantities next year.

The idea for the trial came when Sinclair's managing director Nigel Searle visited Shanghai and Peking last month, and met Chinese officials.

The machines will be assembl-

Continued on page 5

Our mice scoop most prizes

National price rested on tiny mechanical shoulders when 14 micromice — lovingly constructed by true enthusiasts — battled for victory in Madrid.

Each had to find its way unaided to the centre of a large table-top maze, using microprocessors to work out the fastest route.

British entrants came away with a notable total of five out of the seven prizes, including Best Novice for Orac, built by a team

Continued on page 6

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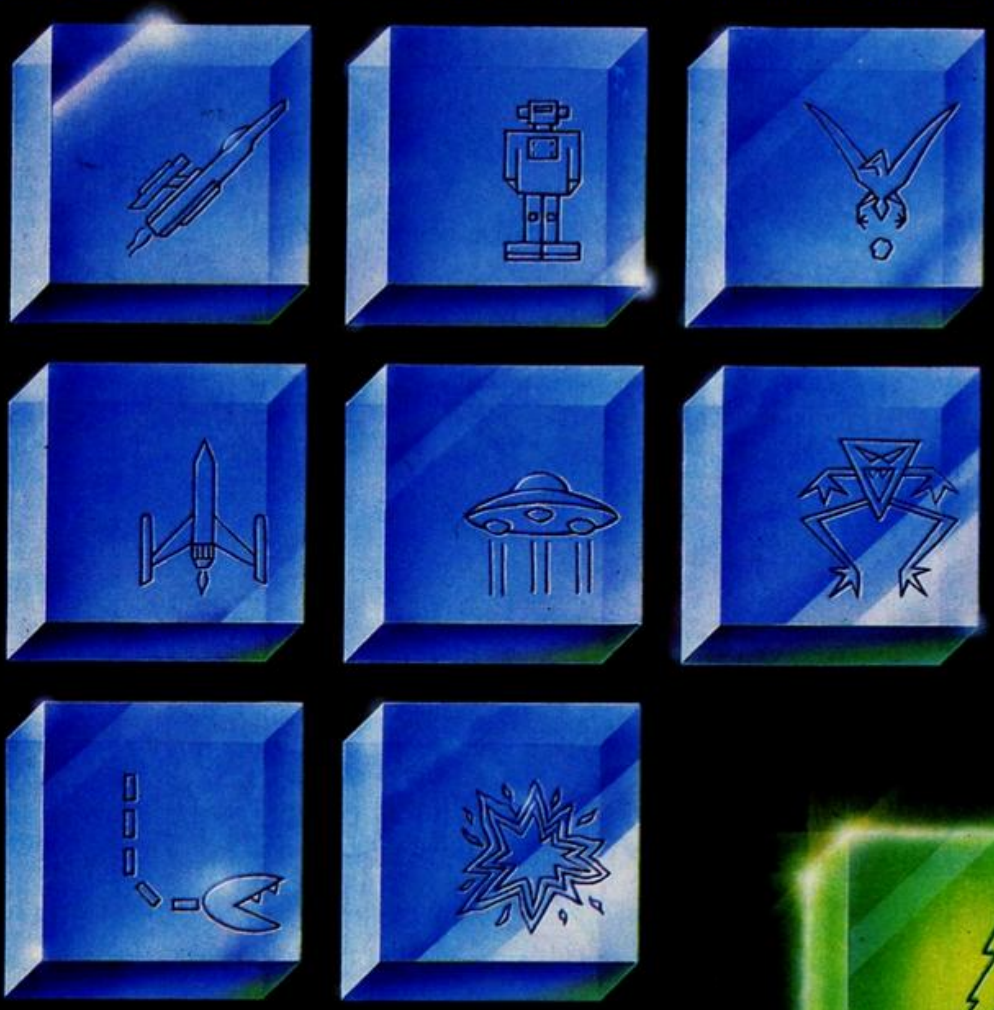

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Briefly

Could this be the program to end all programs? Software Studios' Games Designer is claimed to make it easy — and fun — to write your own games. There's a sprite editor, a sound editor, and a facility for producing special effects like a moving stars background. You can base your home-made games around four basic formats: Invaders, Scramble, Asteroids, and Berserk. And if you get tired of writing your own, there are eight ready-made games included as well. Games Designer is being marketed by Quicksilva, runs on the 48K Spectrum and costs £14.95. It was written by John Hollis, of QS.
Quicksilva, Palmerston Park House, 13 Palmerston Road, Southampton, Hants SO1 1LL

■ ■ ■

For Oric owners who want to find out a bit more about their machines, Linsac has brought out The Oric-1 Companion, a detailed technical guide. Contents include a full explanation of the Oric's keywords, screen display, memory, and ROM. There's also an assessment of the Oric-1 MCP-40 Colour Printer. Price £6.95.
Linsac, 68 Barker Road, Linthorpe, Middlesbrough, Cleveland TS5 5ES

■ ■ ■

Chalksoft says it has the first-ever educational adventure game in the form of Pirate, for the BBC micro and 48K Spectrum. Featuring full colour animation and sound, it aims to teach children strategic thinking, planning and map-making. It costs £9.25.
Chalksoft, 37 Willowslea Road, Worcester WR3 7QP

■ ■ ■

Lotus-soft is a new Spectrum software company based in West Wales. Its first offering, Lord Harry and Lady Harriet, is an animated cartoon maze game. A welcome feature for female computer owners, tired of games that seem to forget their existence, is the option to take the role of either Harry or Harriet, depending on which side of the tape is played.
Lotus-soft, 43 Maes Road, Llangennech, Llanelli, Dyfed SA14 8UH

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SOFTWARE SUPERMARKET

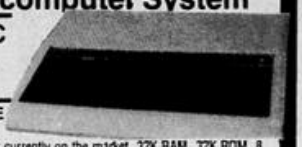
Start our great VIC-20 haunted house adventure — it begins on page 44

What's wrong with your car? The Dragon program, starting on page 11, will tell you

Meet the men behind Lyversoft on page 49

BBC Microcomputer System

OFFICIAL BBC COMPUTER DEALER



MODEL A AVAILABLE £299 inc. VAT

This is the best microcomputer currently on the market. 32K RAM, 32K ROM, 8 modes of operation, full colour, full-size keyboard, internal expansions such as disc interface, speech synthesizer, Econet interface. – In short, it is a personal computer capable of expanding into a small business system.

BBC Microcomputer Model B	£348 + VAT =	**£399.00**
BBC Mod B + disk interface	£409 + VAT =	**£469.00**
BBC Mod B + Econet interface	£389 + VAT =	**£447.35**
BBC Mod B + disk and Econet interfaces	£450 + VAT =	**£517.50**
BBC 100K disk drive	£230 + VAT =	**£264.00**
BBC dual 800K disk drive	£699 + VAT =	**£803.85**
Torch Z80 disk pack including Z80 2nd processor, 64K RAM and CPN operating system	£699 + VAT =	**£803.85**
BBC Teletext receiver (Aug)	£196 + VAT =	**£225.40**
BBC cassette recorder and lead	£26 + VAT =	**£29.90**
Disk interface kit (free fitting)	£86 + VAT =	**£96.60**
Mod A to Mod B upgrade kit	£50 + VAT =	**£57.50**
Fitting charge for A to B upgrade kit	£20 + VAT =	**£23.00**
16K memory upgrade kit	£20 + VAT =	**£23.00**
Games paddles	£11 + VAT =	**£12.65**
12" Monochrome monitor incl. cable	£89 + VAT =	**£102.35**
16" Colour monitor incl. cable	£239 + VAT =	**£274.85**
User guide	£10 + VAT =	**£10.00**
Econet interface (free fitting)	£60 + VAT =	**£69.00**
Speech interface (free fitting)	£47 + VAT =	**£54.05**
BBC disk manual + formating disk	£30 + VAT =	**£34.50**
Parallel printer cable	£10 + VAT =	**£11.50**
BBC word processor (view)	£52 + VAT =	**£59.80**
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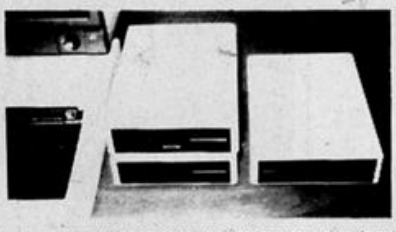

These drives are supplied ready cased with all the necessary cables, formating program and user disk system guide.

There are some useful utilities included, e.g. Epson Screen Dump Program, Memory Dump, Free, Duplicate, Merge and Relocate. Power consumption of these drives is very low (0.2A typ. at + 12V, 0.4V typ. at + 5V per drive). Power is taken from the BBC computer.

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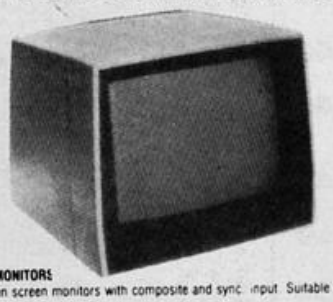

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✻ SANYO SCM 14M Medium res. 14", 600 dots, RGB input supplied with RGB lead	£299 + VAT =	**£343.85**
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EPSON FX80: 80 column, 160 CPS, normal, italic and elite characters, 256 user definable characters, superscript, subscript, 11 x 9 matrix, bi-directional logic seeking, hi-res bit image printing (960 x 8 dots/line), friction and pinfeed, 9 international character sets, Centronic parallel interface.

FX80 PRICE ..... £349 + VAT = **£401.35**

EPSON RX80: 80 column, 100 CPS, normal, italic and elite characters, 11 international character sets, hi-res bit image printing, bi-directional logic seeking, 4" to 10" adjustable pin feed, Centronic parallel interface.

RX80 PRICE ..... £249 + VAT = **£286.35**

MX-100 136 column, 10 CPS, friction and tractor feed, up to 15" adjustable carriage, hi-res bit image printing, true descenders, Centronic parallel interface.

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Intelligent 1EEE 488 interface	£65 + VAT =	**£74.75**
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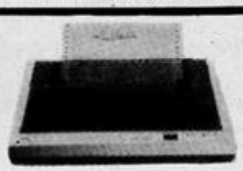

GP-100A 80 column, 50 CPS, dot addressable hi-res graphics, 10" wide, fully adjustable, tractor feed, 7 x 5 print matrix, Centronic parallel interface.

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PERIPHERALS		
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Disk Drive – Internal	92K formatted drive, mounts internally in peripheral expansion system	**£179.95**
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Disk Drive Double Sided	92K formatted capacity per side acts as 2 drives DSK1 & DSK2 total capacity 184K bytes	**£219.95**
Disk Drive External	Complete with own case, power supply & connecting cables	**£259.95**
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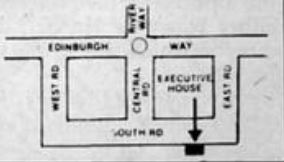


Sinclair's first screen pocket TV — smaller than an average paperback

China

From front page

ed by the South China Computer Company, which is a division of the Chinese government ministry of electronics.

They will, according to a Sinclair spokesman, be exactly the same as the Sinclair machines on sale in the UK — so the Chinese will have to learn to program in BASIC.

But the language barrier shouldn't prove too much of a problem if the Japanese, who are already buying Sinclair computers, are anything to go by.

The huge Chinese market would represent a tremendous opportunity for Sinclair, but the company stressed that it would not know whether it could go ahead until next year.

But if the answer is yes, as agenda for continuing discussion has already been worked out between Sinclair and the Chinese government.

The announcement of the Chinese deal was followed by the public debut of Sinclair's flat-screen pocket TV at the Home Entertainment Spectacular held at London's Olympia.

The TV measures 5½ in by 3¼ in by 1¼ in and weighs 9½ ounces. It has a Polaroid flat-battery which is said to last for 15 hours, and a mains adaptor is also available.

The new TV is to go into full production shortly, but initial supplies will be limited, and available by mail order only. Application forms for the TV, which costs £79.95, can be obtained from Sinclair.

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

Oric discounts

Oric Specialist Kenema is offering a 50% discount on its products to signed-up members of the Tangerine Users Group. Just give your membership number, and you'll be entitled to 50% off Kenema's software range, plus hardware add-ons such as a voice synthesiser and motherboard.

Kenema, 1 Marlborough Drive, Worle, Avon BS22 0DQ

The cat that ate the cream

Cheshire Cat educational software has a lot to smile about. Just a year after work began on the series, it has made the all-important break into chain store sales, under the Ampalsoft label.

Better still, one of the programs in the range, Basic Tutorial, has been featured by Boots in a special Dragon promotional campaign.

Cheshire Cat was the brainchild of Lynn Nixon, Ann Mortimer and Patricia Lansdowne.

Between them, the three women have seven children — Lynn and Ann have two and Patricia has three.

Patricia said: "That was one of the main reasons why we decided to start Cheshire Cat. We all had Dragons at home, but there was just no good educational software out for the Dragon that the children could use."

Patricia and Ann used to run a computer bureau together, and Patricia met Lynn, a former programmer at UMIST, because their daughters were in the same class at school.

The three decided to combine their talents to produce some educational programs. They enlisted the help of friends in teaching, programming and busihess, and Cheshire Cat is now growing rapidly.

Each program may involve as many as seven people, and is tested thoroughly before it goes on the market. According to Patricia: "We use our own children to test the programs under all conditions. They're all very used to computers now — they aren't frightened of them at all."

There are three Cheshire Cat programs currently on sale — Maths Level 1 for five to six year olds, Basic Tutorial and Advanced Basic Tutorial.

Due out soon are Maths Level 2, for seven to eight year olds, Maths O-level Revision 1, and Super Spy, a modern history simulation.

Not to be confused with the Richard Shepherd adventure game of the same name, Super Spy involves you taking the role of a German spy parachuted into Glasgow.

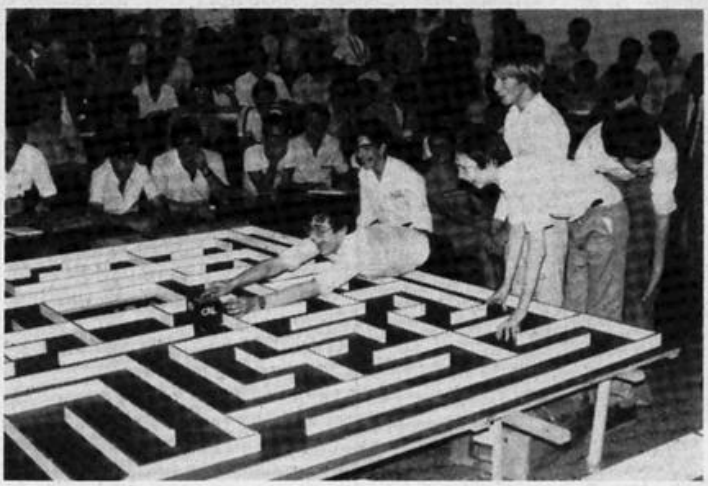
Cheshire Cat's plans for the future include O-level programs on French, German, and Geography, plus beginners' programs on physics, chemistry computer science and general science.

Ampalsoft, PO Box 19, Knutsford, Cheshire WA16 0HE

Lynn Nixon, Ann Mortimer and Patricia Lansdowne — the brains behind Cheshire Cat

This function key guide for the BBC micro tells you the functions of the 10 keys when the computer is in mode 7. Just slip it under the clear plastic strip above the keys. You can use two functions together — for example, flashing red. The other side is blank for you to write in your user-defined functions. The guide was prepared by BBC micro specialists Micro-Aid, 25 Fore Street, Praze, Camborne, Cornwall TR14 0JX

CTRL (Graphics)	144 Nothing	145 Red	146 Green	147 Yellow	148 Blue	149 Magenta	150 Cyan	151 White	152 Conceal	153 Contiguous
SHIFT (Alphanumeric)	128 Nothing	129 Red	130 Green	131 Yellow	132 Blue	133 Magenta	134 Cyan	135 White	136 Flash	137 Steady
USER PROGRAMMED										



Orac with the team that built it

Micromice

From front page

of teenagers and sponsored by software house CRL.

But, as expected, the Finnish team scooped the two main prizes. Their Tellu, a three-wheeler with no less than 19 infra-red sensors, took just 32 seconds to complete the course and win 1,000 dollars.

Its twin, Manu, was unplaced. In fact, the only difference between the two was a different processor board.

Microsaurus, also from Finland, was the favourite in trials, with times of around 15 seconds. But it came second in the final and won a Spectrum.

It had taken a year of part-time work by four university students to build. They had packed hundreds of pounds-worth of equipment into their mouse: four ultrasonic sensors, 20 infra-red sensors, a Motorola processor, 4K of RAM, five servo motors, and four DC motors.

Knownaim, one of two entrants by Dave Woodfield, won £150 for being placed third. A three-wheeler, driven and steered by the front wheel, it uses eight infra-red sensors and a Z80 processor.

And his Thumper, which won the European finals in 1981 in Paris, came fourth. It was Thumper which got the most laughs, because Dave had added a Votrax speech chip.

As Thumper, a four-wheeler, trundled around the maze it "spoke" sentences like: "I wonder why the other mice don't speak to me", "I've been here before" and "I don't like bends." Its maze program was written by Andrew Keatley.

T3, placed fifth, was constructed by another veteran, Alan Dibley. In fact Dave and Alan and their families had travelled together in a hired minibus, taking the ferry to Santandar from Plymouth.

T3's best time to the centre of the maze was 1 min 13.8 secs, just 1.2 secs slower than Thumper. Using the guts of a ZX81, T3 was one of three entered by Alan.

T3, 1982 UK champion, also has three wheels but, unlike his T4, stops before making a turn. His Thezeus, controlled by a ZX80 with the keyboard removed with a hacksaw, was unplaced.

Orac, winner of the Best Novice prize, raised a gale of laughter from the hundreds in the lecture hall audience — all delegates to a high-powered computer conference.

Built in the shape of a two-wheeled black box and wearing the CRL logo, Union Jack and L-plate, Orac was made by five Ilford school pupils.

They are Matthew Hampson, 14, and Edmund Forrester, Michael Geaney, Jay Derrett and Andy Dukes, all 15.

CRL's managing director, Clement Chambers, who financed the work and the team's trip, had a proud look on his face.

Second in the Best Novice section was Fully Automatix II, entered by David Jones and Jonathan Holt, both 16, and William Forster, 17, all from a school in Penley, near Wrexham.

As well as their prizes, each winning team was also presented with a novel trophy — a wedge of gold-coloured "cheese" mounted on a wooden base. Next year's contest will be held in Copenhagen.

The micro that has everything?

Elan's new personal computer, previewed in HCW 24, had now been officially unveiled — but you won't be able to buy it until next March.

Called the Elan Enterprise, it comes in two versions. The 64K version will cost around £200 and the 128K version £300.

As we told you, it has a real keyboard, with eight user definable keys. It also has a built-in joystick.

The Enterprise can display up to 84 columns by 56 lines of text, enabling business applications such as word processing to be carried out easily. And to make the most of that display, it comes with a built-in word processor on ROM.

But if you just want to play games, there are plenty of features to appeal to you too. Like the Atari 400/800, the Enterprise has dedicated sound and graphics chips, separate from the main processor. A first for Elan is the capability for stereo sound.

And when it comes to linking the Enterprise to peripheral equipment, there are plenty of possibilities too. You can connect up two joysticks, and two separate cassette recorders, which can both be started and stopped under computer control.

It has a Centronics parallel and RS423 serial interfaces, allowing you to connect up a range of printers. A local network facility will let 32 computers communicate and share peripherals.

There's a slot for cartridges one side, and on the other, a 64-way connector to link up to peripheral devices via a flexible cord.

The Elan peripheral units, such as extra RAM and disk drives, will be designed to plug into each other to form a neat stack.

The base of the stack is a special unit to provide power for the peripherals.

Elan Computers, 31-37 Hoxton Street, London N1 6NJ

The Elan Enterprise — a lot of memory at a low price

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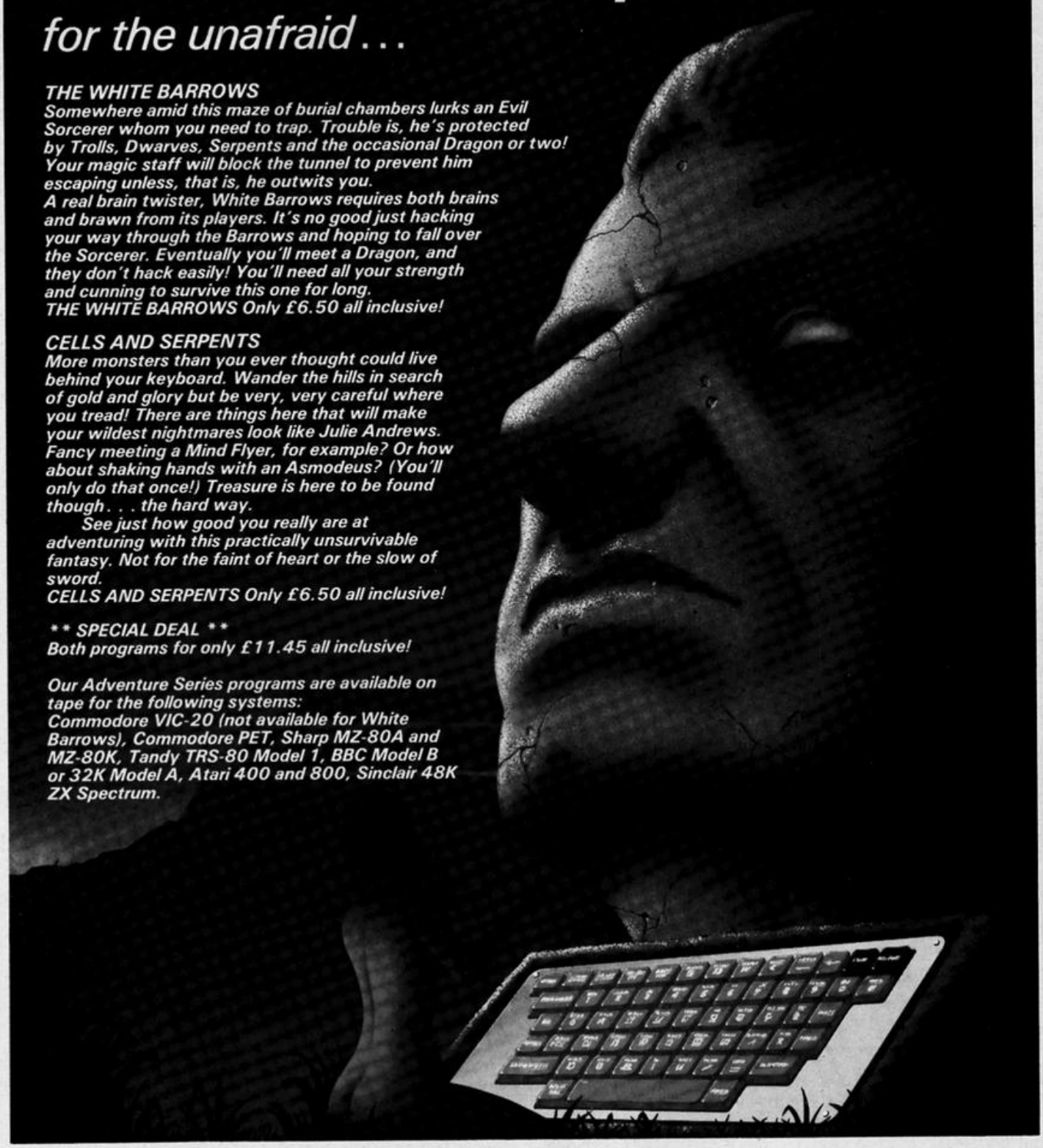

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Save selectively VIC-20

Owners of the VIC 20 micro are now able to save selective memory blocks on to tape using the steps below. The SAVE command only saves programs.

1 POKE locations 193 and 194 with the start address of the memory block.
2 POKE locations 174 and 175 with the end address of the memory block.
3 POKE locations 186 with the device number (1 for cassette, 8 for disk etc.) and location 185 with 3.
4. POKE location 147 with 0 for load and 1 for verify.

To perform save simply SYS 63109 and to perform load simply SYS 62795 (this routine doesn't inform you when it has found something).

The main uses of saving selective memory blocks are for performing screen text dumps onto tape and also to perform a character generator dump onto tape (hi-res picture saving). Now there is no need to load characters from data statements.

```
1 REM SCREEN DUMP PROG DEMO
2 REM INSERT TEXT TO BE SAVED BETWEEN LINES 20-100
10 PRINT CHR$(147)CHR$(5): POKE 36879,8
20 PRINT "TEXT TO BE SAVED"
100 GOSUB 1000
110 PRINT:PRINT "WANT TO LOAD SCREEN?"
120 GET A$:IF A$ = "N" THEN END
130 IF NOT A$ = "Y" THEN 120
140 GOSUB 2000
150 GOTO 150:REM FREEZE
999 REM SAVE SCREEN ROUTINE
1000 GOSUB 3000
1010 IF PEEK (37148) = 254 GOTO1010
1020 SYS 63109 : RETURN
1999 REM LOAD SCREEN ROUTINE
2000 PRINT CHR$(147) : GOSUB 3000
2010 SYS 62795 : RETURN
2999 REM SET UP
3000 POKE 193,0 : POKE 194, PEEK(648)
3010 POKE 174,0 : POKE 175, PEEK(648)+2
3020 POKE 186,1 : POKE 185,3
3030 POKE 147,0 : RETURN
```

Line 110 waits for the user to press play and record.

The routines don't display any messages such as saving etc.

When run press play and record.

David Redmonds

Got a bright idea for using your micro? This is the page where you can share your brainwave with other computer enthusiasts. Send your hints, warnings, discoveries and suggestions to Micro Tips, Home Computing Weekly, 145 Charing Cross Road, London WC2H0EE

Find that location VIC-20 plus 3K

When working out user defined graphics etc, it is always a problem to find out the exact memory location to POKE the new values to. This line of program, when used with DATA statements solves this very quickly.

```
LN FOR CH = 0 to CN:READ C$: C = (ASC(C$) - 64) * 8 = 7168: FOR CS = 0 TO 7: READ CQ: POKE C+CS, CQ: NEXT CS,CH
```

where LN = line number, and CN the number of characters to define.

A matching DATA line would be:—

```
LN DATA "X",123,234,0,34, 62,1,3,0
```

David Shepherdson

Make an introduction Any micro

Before you load data into your computer do you introduce the program via the TV speaker? With the tape recorder linked through to the TV, you don't have to be an expert to realise that this is possible.

For the interest of beginners like myself, here is how I go abut the operation with my TI-99/4A.

Start when you are ready to SAVE your program on to tape. Do not connect computer cable to recorder. Rewind tape to 000 or selected starting number. Record intro in normal manner.

Example: "HCW June 7, '83 program. Subject: Game. Title: Last Stand by Vince Apps. The aliens have invaded the earth and you are the last survivor. In your tank you strive to reach alien headquarters and destroy it before you are wiped out. You can do this by hiding behind trees as you advance... Typed in 27 June...stop recording and advance meter reading by 4 numbers NOW."

You have finished voice recording. Disconnect mike (if not built-in), connect computer cable. Next start SAVE routine, remembering that you do not need to rewind, but advance four numbers instead.

With your program on cassette, the play procedure is straight-forward. attach computer cable. Start from your beginning number, listen to the recorded message and press the recorder STOP button immediately as instructed. **Do not press enter.** Advance the four numbers and proceed in normal manner, that is, press enter but do not rewind.

You may find this method a convenient way of storing information. You do not have to listen to the introduction every time but it is there when needed.

To me it seems quicker and more personal than typing in a screened introduction. The cassette file card would read (say) 1-12 Intro, 16-26 "Last Stand".

Joe Berry

Fun with colour TI-99/4A

This short program for the TI-99/4A shows off the colours in a bright display.

```
10 CALL CLEAR
20 CALL SCREEN (15)
30 X=3
40 FOR T=40 TO 144 STEP 8
50 CALL CHAR (T,"FFFFFFFFFFFFFFFF")
60 CALL VCHAR(1,X,T,48)
70 X=X+2
80 NEXT T
90 FOR T=2 TO 15
100 CALL COLOR (T,T,T)
110 NEXT T
120 G=1
130 FOR T=15 TO 2 STEP -1
140 CALL COLOR (T,G,1)
150 G=G+1
160 NEXT T
170 GOTO 90
```

Neil Sherwood

Protect your screen 48K Oric 1

Owners of the 48K ORIC who wish to protect part of the screen from scrolling can alter the value stored at address #26F. The value stored determines the number of lines to be used for normal scrolling printing etc.

Changing the value takes just one simple line:—

```
DOKE #26D, #BB58:POKE #26F,x:CLS
```

The variable x being the value to be stored.

This line could obviously be incorporated in a program if necessary

Colin Failes

Practical POKEs VIC-20

On the VIC-20 there are lots of POKEs to do weird and wonderful things, but for some reason they are not listed in the user manual. So here I have made a list of some of them. I hope they prove useful to you...

Poke 808,127 disables the RUN/Stop key (any memory VIC)
Poke 808,112 re-enables the RUN/Stop key.
Poke 36864,(0 to 128) moves the screen horizontally.
Poke 36865,(38 onwards) = Moves the screen vertically.
Poke 36866,(1 onwards) = Sets the number of chars on a line.
Poke 36867,(1 onwards) or 128 = Sets the number of lines.
Poke 199,1 = Turns the reverse field on.
Poke 199,0 = Turns the reverse field off.
Poke 204,0 = Flashes the cursor in a GET statement.
Poke 211,(0 to 22) = Sets the cursor column position.
Poke 214,(0 to 22) = Sets the cursor row position.
Poke 649,0 = Disables the keyboard.
Poke 649,10 = Re-enables the keyboard.
Poke 650,255 = Makes every key repeat.
Poke 650,0 = Sets repeat functions to normal.

An interesting effect is obtained by entering:

```
Poke 36879,8
CTRL 2
Poke 788,223
```

Then move the cursor around with the cursor keys.

Alan Blackham

Spectrum selection star-rated

New tapes for the Spectrum go before our jury. Here are their verdicts

The Train Game £5.95

Microsphere Computer Services, 72 Rosebery Rd, London N10 2LA

The drawing on the front of the inlay card is reminiscent of a bygone age. An age when wide eyed youngsters gazed in awesome wonder at those panting, gleaming monsters, the steam trains. When those same youngsters, and oldsters, could recite every detail about most trains in existence.

Over decades, this same enthusiasm has been carried into thousands of homes in the form of model railway layouts. I am not saying that you need to be an enthusiast to play this game, but if you are not then I am sure that your outlook on railways will change after playing.

There are two track layouts on the tape, which loads first time, and after loading the track of your choice you have to choose your skill level. These range from one to seven with the first six having five sub levels, and the seventh having nine sub levels. The idea of the game is to direct the train(s) to stations by means of switching the points, each set of points identified by a letter. At the stations you score points which vary from level to level, by picking up passengers.

Fun, fun, fun to play, with just two small niggles. One, I found the letters identifying the points difficult to see, and two, all the instructions are on the inlay card, so don't lose it. **B.B.**

instructions	80%
playability	100%
graphics	75%
value for money	100%

★ ★ ★ ★ ★

Element Serpent £4.50

Cloud 9 Software, Tavistock PL19 9EA

Having had a little difficulty, when first using this program, in seeing the snake on the screen I was very pleased when at last it showed up.

The program is designed to teach you the elements. This is done by directing a serpent around the screen using the cursor keys. In the bottom part of the screen you are given an element, the rest of the screen is covered in symbols on which the snake feeds.

Pressing any key will start the snake moving, rather fast I felt. However, you must now direct it to the correct symbols. You don't get any points for eating part of it, so you must now aim quickly for the next part not hitting the side of the screen or you die. You also kill the snake if you eat the wrong element.

Should you choose the wrong symbol the correct answer will appear. Should you kill the snake you have to go through a tune, being asked if you want instructions and choosing the level of skill again, which can be a bit tedious.

There are three levels to choose from, level one being elements that I am sure most of us have heard of, and level three more complex.

C.McI.

instructions	90%
ease of use	60%
display	75%
value for money	65%

★ ★ ★

Stomping Stan 48K £4.95

Britannia Software, 116 Woodville Road, Cardiff CF2 4EE

Stomping Stan is an impatient individual who has a mission in life. He has to collect keys, with your help of course, from various locations. Apart from the usual maze-type hazards there are creatures to contend with which are definitely anti-Stan. Because Stan is an egg, heavily disguised, the fiercest creatures are the egg stompers.

Now, if all this sounds familiar it should, because this is a variation of a well-worn theme. The only things to change are the names of the principal characters, the objects to be collected, and the hazards.

So, given the same basic plot, what makes one game more interesting than another? The answer really lies in the skill of the programmer together with the graphics used.

Although this programmer has produced a very smooth action game, the characters are really nothing new, neither are there any new 'twists'. Stomping Stan, by the way, appears to be a very close relation to a ubiquitous character called Horace. No problems in loading the program, and all the instructions are on screen.

Those who have never played this type of game will enjoy this version.

B.B.

instructions	100%
playability	75%
graphics	80%
value for money	70%

★ ★ ★

Bedlam £4.95

AWA Software, 50 Dundonald Road, Didsbury, Manchester M20 0RU

To get an idea of what any game is about I read, when possible, the description on the inlay card. All too often what appears on the screen doesn't match up with the written description.

This is because on the one hand we have the influence of the author's imagination, and on the other the cold, uncompromising screen display. When the players' imagination and enthusiams match those of the programmer then you can be sure that the player will enjoy the game, whatever it is. Any imbalance of either quality and you have disappointment.

My first disappointment was in the description "arcade game". It didn't resemble any arcade game that I have ever seen. As for "synthesised sound effects" that is stating the obvious.

That said, there are three levels of skill, where each level is slightly faster than the other. Killing off the baddies takes you through to other levels where there are even more baddies, some which fire back at you. For some reason "you" resemble a large fly. Because I didn't recognise "me" I didn't move, and lo and behold, all the baddies obligingly marched down to be shot.

B.B.

instructions	90%
playability	60%
graphics	85%
value for money	50%

★ ★

Invincible Island 48K £6.50

Richard Shepherd Software, Freepost, Maidenhead, Berks SL6 5BY

Your task is to find the seven parchments of Xaro, which will lead you to the treasure, hidden somewhere on Invincible Island.

Instructions are typed in using ordinary words, although the vocabulary is limited. Some of the commands are given in the instructions, which makes getting started easier.

There is a graphic representation of each location in the top third of the screen. This is drawn very quickly and complements the written description well. The lower part of the screen contains the description of the location, the commands you have typed in and the computer's replies which scroll up without affecting the graphics.

There are a considerable number of locations, drawing a map makes retracing your steps easier. Thankfully, there is a facility to record the program in mid-game. There were no problems with loading — apart from the time it took.

There are a number of problems to solve on your way to finding the parchments. Surprisingly, no hints are given within the game itself, although some clues are given in an accompanying program which must be loaded separately. **S.E.**

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

★ ★ ★ ★

Finding faults with your Dragon

Fixing your car can be less of a drag with the Dragon. Put down your manual and try typing in Alan Gray's car repair program instead

Has your old faithful car let you down again? If so, get your fingers on to the keys and get typing.

My program will give you nine common areas of trouble and what to do about them.

Care should be taken in entering lines 280-600 — the punctuation is crucial as this sets the data format within the program.

Hints on conversion

The program is written in Dragon Microsoft basic so it is a fairly easy matter to convert.

CLSC clear screen to blue
SCREEN 0,1 gives orange background to text screen
SOUND 200,1 short beep
EXEC 41194 is a ROM call to wait for a key press
PRINT @ 0 is the top left of the screen, 511 is bottom right

Variables

C$ screen colour set inlisting to blue
F$ & G$ data strings
I$ input
I val of I$

How it works

20 save to tape
30-110 initialise and print headlines
120-230 menu
240-270 select from menu
280-620 selection of data strings to form table
630-1090 data strings
1130-1150 check for return or new data
1160 pause to read data

```
10 GOTO40
20 MOTORON:SOUND120,20:CSAVE"CARDOC":STOP
30 REM CARDOC A.GRAY 1983
40 C=3:CLSC
50 DIMF$(26),G$(26)
60 PRINTTAB(10)"CAR DOCTOR"
70 PRINTTAB(10)"*** ******"
80 PRINT"THIS PROGRAM WILL HELP TO SOLVE YOUR CAR
BREAKDOWN
90 PRINT"FOLLOW THE CHECK LIST AND
100 PRINT"ELIMINATE EACH FAULT IN TURN":SCREENO,1
110 GOSUB630
120 CLSC
130 PRINTTAB(10)"CAR DOCTOR"
140 PRINT"FAULT";TAB(10)"*** ******";TAB(25)"SELEC
T"
150 PRINT"ENGINE TURNS BUT WILL NOT    1    START"
160 PRINT"ENGINE STOPS AND WILL NOT    2    START,
170 PRINT"ENGINE MISFIRES AND RUNS          ROUGH"TA
B(28)"3"
180 PRINT"GENERAL LACK OF POWER AND/        OR POOR
COMPRESSION"TAB(28)"4"
190 PRINT"EXCESSIVE OIL CONSUMPTION";TAB(28);"5"
200 PRINT"ENGINE WILL NOT TURN OVER";TAB(28);"6"
210 PRINT"ENGINE OVERHEATS"TAB(28);"7"
220 PRINT"LOSS OF COOLANT";TAB(28);"8"
230 PRINT"EXCESSIVE FUEL CONSUMPTION";TAB(28);"9":
SCREENO,1
```

```
240 I$=INKEY$:IF I$=""THEN240
250 SOUND200,1:I=ASC(I$)-48
260 IF I<1 OR I> 9 THEN 120
270 CLSC:ON I GOTO280,330,360,410,460,490,520,550,
580
280 PRINT"1 ";F$(1),"2 ";F$(2),,"3 ";F$(3),"4 ";F$
(4),,"5 ";F$(5),"6 ";F$(6),"7 ";F$(7),"8 ";F$(9)
290 GOSUB1160
300 PRINT"1 ";F$(10),"2 ";F$(11),"3 ";F$(12),,"4 "
;F$(13),"5 ";G$(5)
310 GOSUB1160
320 GOSUB1130
330 PRINT"1 ";F$(1),"2 ";F$(15),"3 ";F$(8),"4 ";F$
(16);"5 ";F$(6),"6 ";F$(3),"7 ";F$(2),,"8 ";F$(1)
340 GOSUB1160
350 GOSUB1130
360 PRINT"1 ";F$(6),"2 ";F$(2),,"3 ";F$(4),,"4 ";F
$(19),,"5 ";G$(3),,"6 ";F$(3),"7 ";F$(22)
370 GOSUB1160
380 PRINT"1 ";F$(21),"2 ";F$(6),"3 ";F$(17),"4 ";F
$(23),,"5 ";F$(24),"6 ";F$(25),"7 ";F$(26)
390 GOSUB1160
400 GOSUB1130
410 PRINT"1 ";F$(25),"2 ";G$(4),,"3 ";F$(26),"4 ";
G$(1),,"5 ";G$(2),"6 ";F$(21),"7 ";F$(3)
420 GOSUB1160
430 PRINT"1 ";F$(17),"2 ";G$(3),,"3 ";F$(24),"4 ";
F$(20),"5 ";F$(10),"6 ";G$(15)
```

```
440 GOSUB1160
450 GOSUB1130
460 PRINT"1 ";G$(4),,"2 ";F$(26),"3 ";G$(6),"4 ";G
$(7),"5 ";G$(2)
470 GOSUB1160
480 GOSUB1130
490 PRINT"1 ";F$(18),"2 ";G$(9),,"3 ";G$(8)
500 GOSUB1160
510 GOSUB1130
520 PRINT"1 "G$(10),"2 ";G$(11),"3 ";G$(12),,"4 ";
G$(13),"5 ";F$(17),"6 ";F$(21),"7 ";G$(14),,"8 ";G
$(1),,"9 ";G$(15)
530 GOSUB1160
540 GOSUB1130
550 PRINT"1 ";G$(1),,"2 ";G$(16),,"3 ";G$(17),"4 "
;G$(18)
560 GOSUB1160
570 GOSUB1130
580 PRINT"1 ";G$(19),"2 ";F$(11),"3 ";F$(12),,"4 "
;F$(13),"5 ";G$(6),"6 ";F$(17),"7 ";G$(3),,"8 ";F$
(23)
590 GOSUB1160
600 PRINT"1 ";G$(20),"2 ";G$(21),"3 ";F$(3)
610 GOSUB1160
620 GOSUB1130
630 F$(1)="IGNITON SYSTEM WET OR DAMP"
640 F$(2)="HT LEADS BROKEN,LOOSE OR       SHORTED"
650 F$(3)="DIRTY,PITTED OR WRONGLY        ADJUSTED
CB POINTS"
660 F$(4)="LT LEADS BROKEN,LOOSE OR       SHORTED"
670 F$(5)="FAULTY IGNITION SWITCH"
680 F$(6)="FAULTY CONDENSER OR COIL"
690 F$(7)="CB POINTS SPRING BROKEN OR     POINTS 'D
OWN' TO EARTH"
700 F$(8)="FUEL TANK EMPTY!!"
710 F$(9)="CARB JETS OR FUEL PUMP BLOCKED"
720 F$(10)="FAULTY FUEL PUMP"
730 F$(11)="TOO MUCH USE OF CHOKE
740 F$(12)="FLOAT LEVEL WRONGLY SET OR    DAMAGED
FLOAT"
750 F$(13)="LEAKING NEEDLE VALVE"
760 F$(14)="WATER OR DIRT IN FUEL SYSTEM"
770 F$(15)="FUEL CAP BREATHER BLOCKED"
780 F$(16)="BROKEN OR LOOSE LT LEADS      USUALLY
GIVES INTERMITTANT FAULT"
790 F$(17)="MIXTURE WRONGLY SET"
800 F$(18)="BATTERY LEAD,EARTH STRAP OR   ENGINE L
EAD LOOSE"
810 F$(19)="LT LEADS LOOSE ON COIL OR     DISTRIBU
TOR"
820 F$(20)="FUEL FILTER BLOCKED"
830 F$(21)="IGNITION TIMING WRONGLY SET"
840 F$(22)="CRACKED DISTRIBUTOR CAP"
850 F$(23)="AIR LEAKS. IE MANIFOLD OR CARBBASE"
860 F$(24)="BADLY ADJUSTED VALVES"
870 F$(25)="STICKING OR BURNT OUT VALVES"
```

```
880 F$(26)="WORN PISTON RINGS,VALVE       GUIDES O
R WEAK VALVE SPRINGS"
890 G$(1)="LEAKING HEAD GASKET(USUALLY    EASILY HE
ARD)"
900 G$(2)="WORN OR SCORED BORES"
910 G$(3)="DIRTY OR WRONGLY GAPPED        SPARKING
PLUGS"
920 G$(4)="WORN VALVE GUIDES OR STEM      SEALS"
930 G$(5)="LT LEADS CONNECTED THE WRONG   WAY AROUN
D"
940 G$(6)="WORN PISTON RINGS"
950 G$(7)="GENERAL OIL LEAKS"
960 G$(8)="FLAT OR FAULTY BATTERY"
970 G$(9)="FAULTY STARTER MOTOR,SWITCH ORSOLENOID"
980 G$(10)="WATER LEVEL LOW"
990 G$(11)="LOOSE FAN BELT"
1000 G$(12)="RADIATOR BLOCKED OR HOSES    COLLAPS
ED"
```

```
1010 G$(13)="THERMOSTAT STUCK CLOSED"
1020 G$(14)="OIL LEVAL LOW"
1030 G$(15)="EXHAUST BLOCKED"
1040 G$(16)="RADIATOR LEAKING OR LOOSE    HOSES"
1050 G$(17)="THERMOSTAT GASKET LEAKING"
1060 G$(18)="CYLINDER HEAD OR BLOCK       CRACKED
"
1070 G$(19)="AIR FILTER BLOCKED"
1080 G$(20)="TYRES UNDER INFLATED"
1090 G$(21)="BRAKES DRAGGING"
1100 GOSUB1160
1110 RETURN
1120 GOTO1120
1130 CLSC:PRINT@257,"HAVE YOU SOLVED THE PROBLEM ?
";:SCREEN0,1
1140 I$=INKEY$:IFI$=""THEN1140:SOUND200,1
1150 SOUND200,1:IF I$="Y" THEN 120 ELSE GOTO 270
1160 PRINT@451-32,"PRESS ANY KEY TO CONTINUE";:SCR
EEN0,1:EXEC41194:CLSC:SOUND 200,1:RETURN
```

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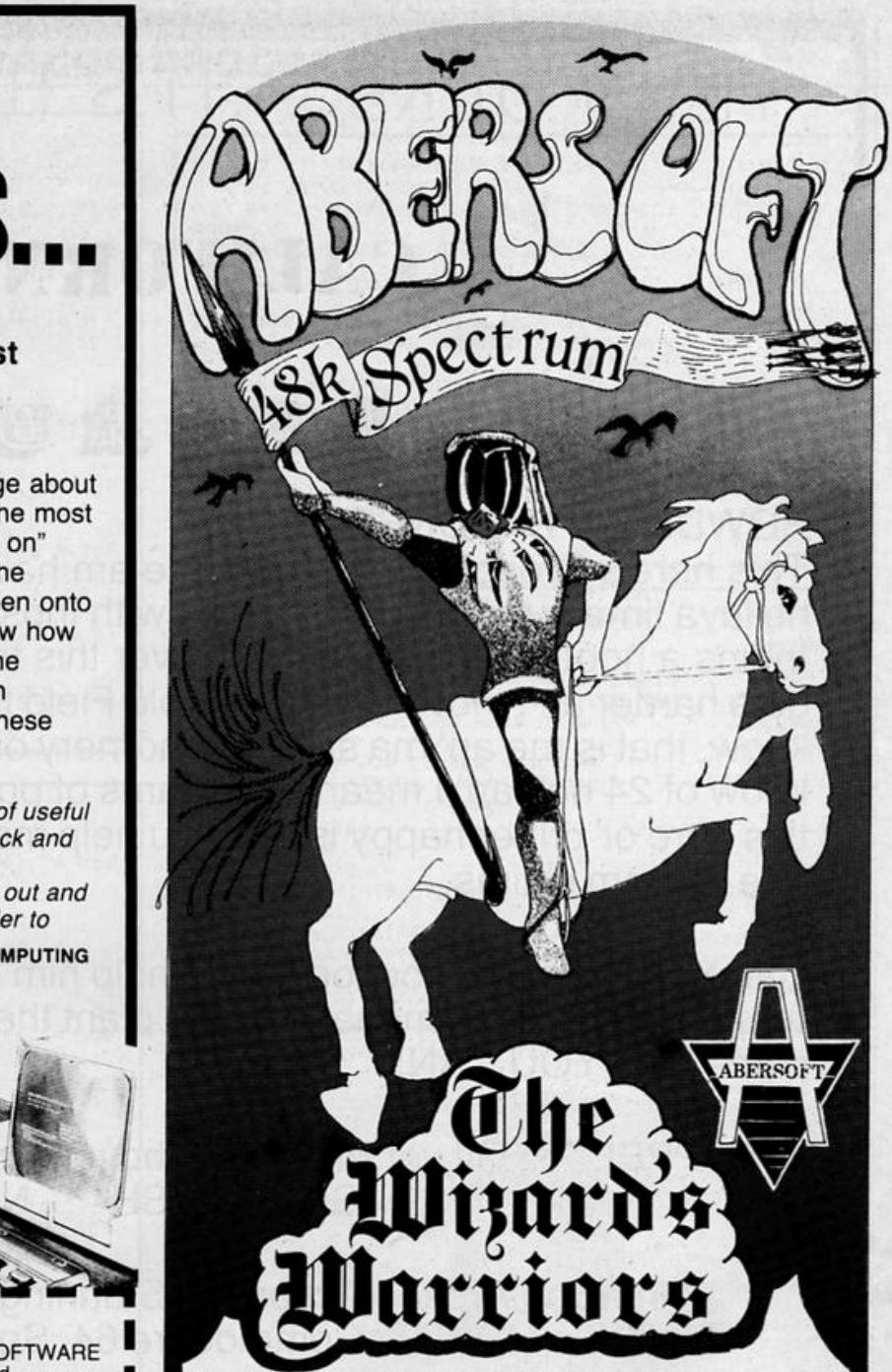

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Are they worth the money?

Cartridge games reviewed by Mike Roberts. Most also have a joystick option

Parsec £29.95

This is the most beautiful arcade game for the TI that I have ever seen.

The use of the speech synthesiser from within the program is excellent. It simulates an on-board combat computer warning you of impending attack and other warnings such as running out of fuel, and it (or rather she as it is a female voice) will give encouraging remarks as to your progress, a pleasant change from some sarcastic computer games.

The concept of the game is similar to the scramble/defender type, with the space ship travelling horizontally across a moving planetary surface strewn with objects. If you hit this you lose one of your initial five lives. New ships are granted at regular intervals.

There are eight different types of nasties out to get you and they come in waves, so you have to destroy all of the first type before you go onto the next. If this is not enough for you, you are in constant danger of your laser overheating and your ship blowing up, running out of fuel and having to fly down a tunnel to get some more, and flying through an asteroid belt.

There are 16 different levels to get through, and although I have been playing this game for a week now I have only got to level 4, so it is very challenging.

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

★★★★★

Car Wars £19.95

The object is to race around a five-lane race track. Of course there is a computer controlled car racing round in the opposite direction to you trying its very best to smash you up.

The lanes of the race track have four points where you can change up to two lanes. The lanes are filled with dots, which you have to run over, Pac-man fashion, to obtain points. After a user defined number of dots have been cleared the car will speed up. The other difficulty setting is a choice of three speeds, creepin', fast, and flyin'.

A bonus is awarded from 200 to 1000 points depending on skill level.

The instructions are good, except that they don't mention that the arrow keys can be used in place of a joystick. The graphics are quite good and the game is very fast.

The only real gripe against this game is that it is very simple and, after a while, boring. It doesn't warrant the price or to be put in a cartridge. When Commodore has a simple but amusing game like Blitz they put it on tape and don't charge an extortionate amount for it.

But aside from that this is a well put together game with good documentation and instructions.

instructions	100%
playability	60%
graphics	90%
value for money	40%

★★★

TI Invaders £19.95

Space invaders is getting a bit long in the tooth and TI Invaders is no exception.

This program is a good representation of the game that took the world by storm so many years ago. There are some differences — aren't there always? — and in this case they are for the better. There are two skill levels, called "merely aggressive" and "downright nasty" which is a nice touch. The instructions are very clear and concise except for the point that the keyboard arrow keys can be used instead of a joystick.

After each screen of invaders you can shoot it out with a mystery ship on its own.

A new laser base is awarded at 3,000 points and at 10,000 points one of your demolished forts is repaired.

The graphics are good. Although they look like invaders they don't look like the arcade invaders. The laser bases are good and when one is destroyed it turns into a wreck and is lowered into an underground cavern and another will take its place.

When the invaders have ultimately won they will jump up and down with much glee.

This game is getting a bit obsolete and boring, but it's not TI's fault and this is a good game despite the limitations of the game concept.

instructions	80%
playability	40%
graphics	90%
value for money	30%

★★★

Alpiner £24.95

A very interesting game with a concept that I haven't seen before. The game needs explaining in some detail as it is different to anything else on the market.

The idea is to climb up six of the world's biggest mountains while avoiding falling rocks, mountain lions, bears, skunks, rotten eggs, bats, trees, etc. The speech synthesiser option generates male and female voices which will warn you of impending doom and give encouraging remarks.

There is an option for two players and seven differing languages are available, although the speech synthesiser still speaks in English. Points are awarded for how high you get, plus various other bonus points.

The graphics are excellent, and produce a good picture of a cliff face with all the animals and other dangers well represented, and a very realistic climber that moves properly as he climbs up the mountain.

The instruction book is up to TI's usual standard and runs to 18 pages, and is quite comprehensive.

Overall this game would be good for someone who wants something that is a bit different to the normal run of the mill zap-the-klingons game.

instructions	100%
playability	85%
graphics	100%
value for money	60%

★★★★

Video Chess £34.95

This cartridge gives as much as could be reasonably expected from a computer chess program. Unfortunately, it is rather overpriced compared to other chess programs available for other computers.

The instructions first give an explanation of the game of chess itself and the notation used to describe your moves to the computer.

The manual then goes on to explain the various options available to the user.

These are all menu-driven. The first menu has six options: play game, which starts the play; selection of game type, which gives you three other menus — level of play, style of play, or colour; chess board, which enables two human players to play; set up a problem, this means you can set up the board in any position and to play the computer from there; play more than one game simultaneously, up to nine games can be played; and to load in a game from cassette tape.

When playing a game you can cancel the last move, resign, offer a draw to the computer, replay from start, change sides, rearrange the pieces, change the style of play, correct the last move, and save the current status on cassette tape.

Castleing, pawn promotion, and en passant are all supported.

instructions	100%
ease of use	85%
display	100%
value for money	60%

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More haste, less speed

In the race for quicker processing, the Commodore 64 has a few tricks you can use. David Rees shows how to put them to use

In comparisons between the BBC micro and the Commodore 64, one of the BBC's main virtues is its speed advantage.

There are two reasons for this. The first is that the BBC's processor clock is running at twice the speed of the Commodore's clock. The processor speed determines the main running speed of the computer, and if the CPUs of two machines are similar, comparisons can be made. From this, it can be seen that the BBC has a big advantage.

The second reason is that the BBC's text mode, mode 7, takes up half the memory of the Commodore's screen, so scrolling is twice as fast.

In the face of this advantage, you'd not be blamed for thinking the situation was hopeless, but the Commodore does have a few tricks up its electronic sleeve.

An obvious point is to avoid scrolling or screen clearing, but much more can be done.

BASIC "crunching" is a simple, but effective method. When running a program, each line has to be read and translated, and this slows down your routines. So removing unnecessary sections can be rewarding.

Spaces can easily be removed, and replacing large numbers by variables (less to read) in repeating routines saves time.

Another way to crunch programs is to put several commands on one line, saving time needed to read the data before each line (eg. line number and position).

A final saving can be made by removing actual keywords and symbols. An obvious example is the LET keyword, but there are several less well known instances. Some of these are given in the program listing.

Another time saving tip lies in the fact that some BASIC commands take a shorter time to execute than others. For example, a FOR...NEXT loop can be up to 10 times faster than an equivalent IF...GOTO loop.

The slow commands to avoid are IF...THEN, COS, SIN, TAN and "to the power of". They can be replaced in some cases, such as using an array of SIN values.

The most useful improvement is to PRINT to the screen, instead of the POKE command more commonly used in games, as it can sometimes be twice as fast.

Delving one layer deeper into the computer, we reach the operating system, the routines which keep the computer in good order. This cannot be changed easily, but one feature can be manipulated.

The Commodore 64 has a routine used by an IRQ (interrupt request) which takes time away from your program to update data, such as incrementing TI and getting a pressed key.

This routine is jumped to every fraction of a second, and the delay time is determined by location 56322. The normal value of this register is 68, but by POKEing higher values, the delay time is lengthened, giving more time to your program.

The interrupt can actually be stopped, but this action is rather drastic. If you do wish to do this, the starting and stopping routines are, respectively:

```
POKE 56334, PEEK (56334) AND 254
POKE 56334, PEEK (56334) OR 1
```

However, please note that once this is done you will lose control of the computer as there will be no key input. I have solved this problem, but the method only works well within a program:

```
SYS 65508: GET A$
```

The final step into the computer involves using the chips themselves.

The video chip is a tremendously versatile tool, but it does have its shortcomings.

In the computer there is a path called an Address Bus. This is used to move bytes around to be processed and normally carries your program instructions. However, for sprites and the screen to be displayed, data must be transferred to the television.

Thus, every fraction of a second the Address Bus is taken over to transfer the 2,000 or more bytes, slowing down your program.

Some time can be saved by using the minimum number of sprites, but the main culprit is the screen. The screen can be blanked, but this is only really useful for non display programs with long, repetitive routines.

If you do have such a program, use the following routines to blank and enable the screen, respectively:

```
POKE 53265,PEEK(53265) AND 239
POKE 53265,PEEK(53265) OR 16
```

Using these tips wisely and taking time to study your program can lead to speed increases of 30 per cent, and in a few cases over 50 per cent so even if you only use a few suggestions, you can make a big difference to your programs' performance.

```
8 REM* NORMAL PROGRAM *
9 REM* TAKES 21 SECS  *
10 N=0
20 N=N+1
30 PRINT"■";N
40 IF N<999 THEN GOTO 20
50 END
97 REM* FULLY SPEEDED *
98 REM*    PROGRAM    *
99 REM* TAKES 12 SECS *
100 POKE56334,PEEK(56334)AND254
110 POKE53265,PEEK(53265)AND239
140 X=999
150 FORN=0TOX:PRINT"■"N:NEXT
200 POKE56334,PEEK(56334)OR1
210 POKE53265,PEEK(53265)OR16
220 END
298 REM* BASIC SHORTENING *
299 REM*     EXAMPLES     *
300 LET A=1
301 A=1
310 PRINT"■";A
311 PRINT"■"A
320 IF A<>0 THEN GOTO 310
321 IF A THEN GOTO 310
330 IF A=1 THEN GOTO 310
331 IF A=1 THEN 310
```

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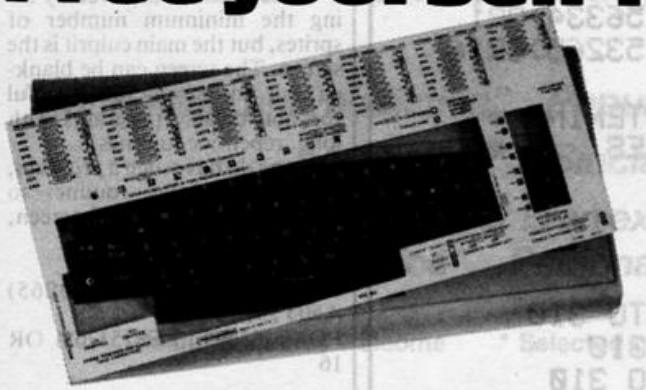

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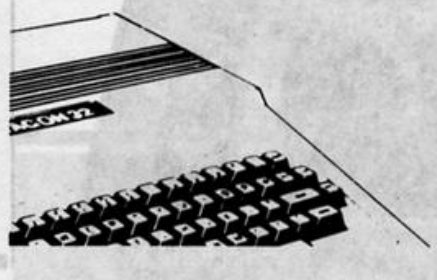

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Ray guns at the ready . . . here come the Swarmers

Great graphics and sound make Swarm, by Kevin Boyd, a must to type into your VIC-20. It needs a Super Expander and joystick or, by making a few easy changes it will run with just 3K expansion and keyboard control

Waves of raiders from the planet Swarm are out to destroy your planet and you have been put in charge of three photon-powered ray guns to fight them off.

At first the raiders are in a group of five, but they increase in number after each wave is destroyed.

You score points when you shoot a swarm, depending on the wave you are on and how many there are.

As written, the game needs a VIC-20 with Super Expander and joystick. Here is how to change it for a VIC with just 3K expansion and no joystick.

The main commands used are at line 320 where the joystick is read and the values returned given to A. Lines 332-335 then act on these values.

Lines 330-335 should be replaced with:

```
320 GET K$
330 IF K$ = "Q" THEN Y = Y - 22
332 IF K$ = CHR$(13) THEN 1000
335 IF K$ = "Z" THEN Y = Y + 22
```

And add:

```
6 POKE 650,128
```

This gives repeat on all keys. So, with the above modifications, the controls are:

Q up
Z down
RETURN fire

How it works

15-34 character generator
35-130 character data
139-275 set up screen
280-390 main game routine
999-1080 laser fire routine
1099-2130 explosion routine
2499-3155 wave display etc
3499-4120 score routine, new game option
4999-5200 introduction, instructions

The other Super Expander command used is the SOUND command. This command has five parameters and each constant or variable is separated by a comma.

The first four parameters are the VIC's sound registers, 36874-36877, and the last parameter is the volume register (36878).

The program uses multi-coloured user-defined graphics which allow four colours on one character matrix rather than the usual two. Line 220 sets up the multi-coloured effects and, by POKEing the characters to the screen with colours higher than seven, one puts a character into multi-coloured mode.

For example, line 350 POKEs the ship on the screen and then POKEs the colour pink on top. Try changing line 220 to different numbers and you will get some good effects.

You'll find the following advice useful when you are typing in the program.

Lines 1 and 2 contain deletion characters (inverse Ts). This is achieved by first typing in the line until you reach the deletion characters. After the first quote mark (") place another. Now delete the second quote mark and insert six times.

Nothing should happen when you do this, but when you press the DELetion button six times six deletion characters will appear. Now type in the rest of the line as shown.

When LISTed, lines 1 and 2 will have lost their line numbers and REM statements, just leaving the remarks.

Lines 230 and 240 may also cause problems. Here is how to type them in:

```
230 " 5 spaces @A 3 spaces B@A 12 spaces BB 3 spaces @A 13 spaces BB @A@AB@A@A 6 spaces @A 3 spaces B@A 9 spaces "
```

For line 240, I will give the spaces only:

```
240 " 4 spaces 6 spaces 4 spaces 2 spaces 4 spaces 6 spaces "
```

If by any chance you manage to survive 95 attack waves the attack wave counter will go back to 1.

Main variables

V position of spaceship
WV number of Swarmers in the wave
WC wave count — how many Swarmers have been destroyed in the current wave
ML number of spaceships left
P(Q) Swarmers position
L laser beam position
CR which of the three types of Swarmers are on the screen

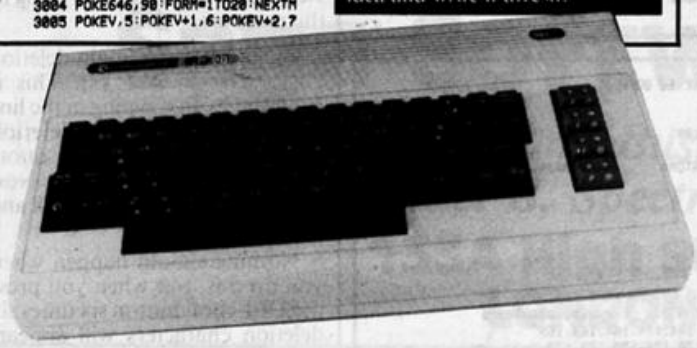
```
1 REM"■■■■■■■  S.W.A.R.M  BY  KEVIN BOYD &  ANGUS DORBIE
2 REM"■■■■■■■
3 GOSUB5000
4 POKE52,28:POKE56,28:POKE51,0:CLR:DIMP(99)
5 PRINT"■■■■■■■PLEASE WAIT FOR CHARS."
15 REM■■■■■■■
```

VIC-20 PROGRAM

```
1030 SOUND0,0,0,128+S,N
1035 IFPEEK(L+1)=CRTHEN 2000
1040 NEXT
1050 SOUND0,0,0,250,6
1060 FORL=V+3TOV+21
1070 POKEL,32:NEXT
1080 GOTO335
1099 REM**********          *  EXPLOSION *          **********
2000 POKE36878,16:T=15.5:FORS=238TO200STEP-1:T=T-.5:SOUND200+T,128+T,0,S,T
2010 POKEL+1,170:POKEL+1,32:NEXT
2100 FORQ=1TOWV
2110 IFEF=0ANDPEEK(P(Q)-1)=7THENP(Q)=7681:EF=1
2120 NEXT:EF=0
2125 WC=WC+1:SC=SC+(100*WV*WC):IFWC=WVTHEN2500
2130 GOTO1050
2499 REM**********          *WAVE DISPLAY*          **********
2500 FORL=V+3TOV+21
2501 POKEL,32:NEXTL
2503 FORJ=254TO128STEP-1:SOUND3,J,J,0,15:SOUND0,0,0,0,0:NEXTJ
2509 PRINT"   ATTACK WAVE "WV-4"          COMPLETED"
2510 FORD=1TO1000:NEXTD
2520 PRINT"
2525 FORC=38424TO38788STEP22:POKEC,10:POKEC+1,10:POKEC+2,8:NEXTC
2530 X=0:WV=WV+1:WC=0
2535 IFCR=9THENCR=23
2536 IFCR=25THENCR=0
2545 CR=CR+1:PRINT"
2546 IFWV>=99THENWV=5
2547 SOUND0,0,0,250,6
2550 GOTO300
3000 FORR=15TO8STEP-1
3001 POKEV,32:POKEV+1,32:POKEV+2,32
3002 IFVC7988THENV=V+22
3003 POKEV,42:POKEV+1,42:POKEV+2,42
3004 POKE646,98:FORM=1TO20:NEXTM
3005 POKEV,5:POKEV+1,6:POKEV+2,7
```

Hints on conversion

Because of the number of POKEs used, it would be quite difficult to convert to another computer except, perhaps, the Commodore 64. It would be best to take the idea and write it afresh.



```
3010 SOUND0,0,0,200,R:POKE646,R+1
3020 PRINT"   MID$(A$,I,22)MID$(B$,I,22)MID$(C$,I,22)D$
3030 POKE646,98:FORM=1TO20:NEXTM,R
3100 ML=ML-1:IFML=0THEN3500
3110 PRINT"   YOU HAVE "ML" MEN LEFT"
3120 FORD=1TO1000:NEXTD
3130 PRINT"   HERE COMES WAVE "WV-4"   GET READY TO FIGHT"
3140 FORD=1TO3000:NEXTD:PRINT"
3141 FORQ=1TOX:POKEP(Q),32:NEXTQ
3150 FORC=38424TO38788STEP22:POKEC,10:POKEC+1,10:POKEC+2,10:NEXTC
3151 SOUND0,0,0,250,6
3152 V=7982:POKEV,5:POKEV+1,6:POKEV+2,7
3155 X=0:WC=0:MF=0:GOTO300
3499 REM**********          *END  ROUTINE*          **********
3500 FORT=38TO168STEP.5:POKE36881,T
3501 SOUND150+RND(1)*100,94+T,254-T,200,15
3508 NEXTT:SOUND0,0,0,0,0
3509 POKE36867,46:POKE36879,25
3510 PRINT"   WELL DONE YOU SCORED   "SC"  POINTS"
3511 PRINT"   AND YOU GOT THROUGH     WV-4"WAVE(S)"
3520 PRINT"   DO YOU WANT ANOTHER GO"
3530 FORT=168TO38STEP-.5:POKE36881,T:NEXTT
3540 GET Q$:IFQ$=""THEN3540
3550 IFQ$="Y"THENCLR:GOTO140
3555 IFQ$="N"THEN 4000
3560 GOTO3540
4000 PRINT"   BYE FOR NOW!   "
4100 POKE36869,240
4120 END
4999 REM**********          *INTRODUCTION*          **********
5000 POKE36879,25:POKE36869,240
5010 PRINT"   S.W.A.R.M."
5020 PRINT"   SWARMING."
5022 PRINT"   WARMONGERING."
5024 PRINT"   RMED."
5026 PRINT"   RIDER."
5028 PRINT"   CHINES."
5030 PRINT"   RE TRYING TO INVADE     YOUR PLANET!"
5040 PRINT"   PRESS A KEY TO CONT":POKE198,0:WAIT198,1
5050 PRINT"   YOUR JOB IS TO STOP    THEM.YOU HAVE A SUPPLYOF  3   PHOTON POWERED
";
5055 PRINT"  GROUND DESTROYERS   WHICH FIRE DEADLY WARRAYS WHICH IS THE ONLYTHI
NG ";
5060 PRINT"WICH CAN DESTROY THE SWARMERS."
5070 PRINT"THEY WILL COME IN WAVEFORMATION AND INCREASEIN NUMBER EACH TIME";
5080 PRINT" A WAVE IS DESTROYED."
5085 PRINT"   PRESS A KEY TO CONT":POKE198,0:WAIT198,1
5090 PRINT"   YOU CONTROL YOUR CRAFT WITH THE JOYSTICK."
5100 PRINT"   GOOD LUCK!YOU NEED IT!"
5110 PRINT"   PRESS A KEY TO START":POKE198,0:WAIT198,1
5200 RETURN

READY.
```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Watch him soar through the air

Gymnast, which runs on either Spectrum, is a short but clever program from Thomas Goodchild which shows how user defined characters can be put to good use

Suitable for either Spectrum model, this simple program (about 5½K) simulates a gymnast on a trampoline.

The object is to get the gymnast to the maximum height in the least number of jumps. Press J to jump. The number of jumps and height attained are displayed continuously.

The data for the user-defined characters is entered in hexadecimal to save programming time. The 12 UDG characters are positively identified at the beginning of each data line (6010-6014).

Those who prefer to isolate the data for each character may do so by inserting the plus sign as shown in line 6010. This is not essential but sometimes helps.

The program may be SAVEd, ready to play on re-LOADing, by entering the instruction SAVE "tramp" LINE 15.

The contents of the strings are shown at the beginning of each DATA line.

How it works

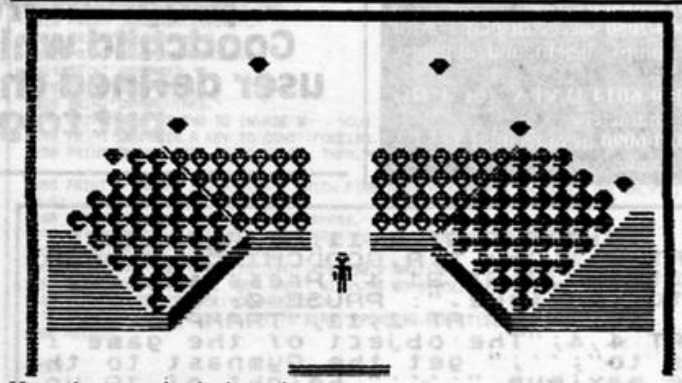
10-20 introduction, set up UDGs and starting values
30-100 screen display, string allocation
110-1012 jump and control of jump routine
1015-1060 try again?
2000-2050 success display — with jumps, height and applause etc
6000-6014 DATA for UDG characters
6020-6090 hexadecimal DATA loader

```
   0>PRINT AT 1,11;"TRAMPOLINE";
AT 8,1;"by T.A.GOODCHILD     Augu
st 1983";AT 21,4;"Press any key
to continue.": PAUSE 0: CLS
  10 PRINT AT 1,11;"TRAMPOLINE";
AT 4,4;"The object of the game i
s to";;;;" get the Gymnast to th
e maximum ";;;;" height of 19 un
its.";AT 21,4;"Press any key to
continue."
  11 PRINT AT 10,4;"To increase
height of jump ";;;;"PRESS J jus
t before the Gymnast";;;;"reache
s the Trampoline. ";;;;"     A li
ttle practice will get";;;;"the
timing right.": PAUSE 0: CLS
  12 GO TO 20
  15 GO SUB 6000
  20 BORDER 1: PAPER 1: LET y=21
: LET j=0: LET h=16
  30 CLS : BORDER 1: PAPER 1: IN
K 7: PAPER 1
  50 PRINT #1;AT 0,11; BRIGHT 1;
 PAPER 5; INK 2; INVERSE 1;"■XX
XXX■"
  55 PRINT AT 0,0; INVERSE 1;"▄
                              "
  60 FOR y=1 TO 21: PRINT AT y,3
1;"▌";AT y,0;"▐": NEXT y
  65 PRINT AT 21,13; INK 2;"▀▀▀
▀"
  68 PRINT #1;AT 1,0; PAPER 6;"
                              "
;#0;AT 0,0;"▛";AT 0,31;"▜"
  70 PRINT AT 5,7; INK 7; BRIGHT
 1;"●";AT 5,24;"●";AT 8,3;"●";AT
 8,28;"●";AT 2,11;"●";AT 2,20;"●
"
  71 LET K$="▀▀▀▀▀▀▀▀ "
  72 LET F$="▀▀▀▀▀▀▀▀▄"
  73 LET E$="▀▀▀▀▀▀▀▀▀▀▀▀▀": LET
L$="▀▀▀▀▀▀▀▀▀▀▀▀▀▀"
  74 LET H$="▗"
  75 LET I$="▜"
  76 LET d$="▟"
  78 LET c$="▀▀▀▀▀▀▀▀▀▀"
  80 PRINT AT 15,1;c$(5 TO );AT
16,1;c$(4 TO );AT 17,1;c$(3 TO )
+I$;AT 18,1;c$(2 TO )+I$;AT 19,1
;c$( TO 5)+c$(1)+"▜"
  82 PRINT AT 15,3;F$;AT 16,4;F$
(3 TO )+I$;AT 17,5;F$(5 TO )+I$;
AT 18,6;F$(7 TO )+I$
  84 PRINT AT 14,2;F$( TO 7)+F$(
2);AT 13,3;F$( TO 6);AT 12,4;F$(
 TO 4);AT 11,5;F$( TO 2)
  86 PRINT AT 15,11;"▀▀▀▀";AT 15,
17;"▀▀▀▀"
  88 PRINT AT 11,7;E$( TO 7);AT
11,17;E$( TO 7);AT 12,8;E$( TO 6
);AT 12,17;E$( TO 6);AT 13,9;E$(
 TO 5);AT 13,17;E$( TO 5);AT 14,
10;E$( TO 4);AT 14,17;E$( TO 4)
  90 PRINT AT 19,23;"▙"+c$( TO 5
)+c$( TO 2);AT 18,25;H$+c$( TO 5
);AT 17,26;H$+c$( TO 4);AT 16,27
;H$+c$( TO 3);AT 15,28;H$+c$( TO
 2);AT 14,29;H$+c$(1)
  92 PRINT AT 18,22;"▙"+K$(1);A
T 17,21;"▙"+K$( TO 3);AT 16,20;
"▙"+K$( TO 5);AT 15,20;"▙"+K$(
TO 7)
  94 PRINT AT 14,21;K$( TO 7)+K$
(1);AT 13,22;K$( TO 7);AT 12,23;
K$( TO 5);AT 11,24;K$( TO 3)
 100 PLOT 54,88: DRAW 32,-32: PL
OT 194,88: DRAW -32,-32
 110 FOR y=21 TO 0 STEP -1
 120 IF y<=21 AND y>=h THEN PRIN
T AT y-1,15; BRIGHT 1;"▟";AT y,1
5;"▛": IF y<=20 THEN PRINT AT y+
1,15;" "
 130 IF y=21 THEN BEEP .01,0
 135 IF h<=2 THEN LET h=h+1
 138 IF h=3 AND y>=21 THEN GO SU
B 2000
 140 IF y<=21 AND y>=h AND y>=2
THEN NEXT y
 142 IF y<21 THEN PRINT AT 21,13
; BRIGHT 1; INK 2;"▀▀▀▀▀"
 148 PRINT #1;AT 1,0; PAPER 6; I
NK 9;"JUMPS:";j;"  "
 150 FOR y=h TO 21
 155 IF y=h THEN LET j=j+1
 156 IF y=21 AND INKEY$<>"j" AND
 INKEY$<>"J" THEN LET h=h+1
 157 IF y=21 AND INKEY$<>"j" AND
 INKEY$<>"J" AND h=21 THEN LET h
=20
 160 IF y<=20 AND INKEY$="j" OR
INKEY$="J" THEN GO SUB 1000
 161 IF y=21 AND INKEY$="j" OR I
NKEY$="J" THEN LET h=h-1
 163 IF y=0 THEN GO SUB 1000
 165 IF y<=21 AND y>=h THEN PRIN
T AT y-1,15; BRIGHT 1;"▟";AT y,1
5;"▛": IF y<=21 THEN PRINT AT y-
2,15;" "
 166 PRINT #1;AT 1,21; PAPER 6;
INK 9;"HEIGHT:  ";22-h;"  "
 170 IF y>=h AND y<=21 THEN NEXT
 y: GO TO 110
1000 IF y=21 THEN LET h=h+1: PRI
NT AT 4,24;(21-h); LET y=y+1
1005 IF INKEY$="J" OR INKEY$="j"
 AND y<19 THEN GO TO 160
1010 IF h>=18 THEN LET h=18
```

SPECTRUM PROGRAM

```
1012 RETURN
1015 PRINT AT 8,3;"Do you wish
to try again?";AT 11,8;"(Y)es, (
N)o "
1018 IF INKEY$="" THEN GO TO 101
8
1020 IF INKEY$="Y" OR INKEY$="y"
 THEN CLS : GO TO 20
1030 IF INKEY$<>"y" AND INKEY$<>
"Y" THEN GO TO 1018
1060 RETURN
2005 FOR n=1 TO 21: BEEP .01/n,3
*n
2008 PRINT OVER 1;AT 11,7;L$( TO
 7);;AT 11,17;L$( TO 7);AT 12,8;
L$( TO 6);AT 12,17;L$( TO 6);AT
13,9;L$( TO 5);AT 13,17;L$( TO 5
);AT 14,10;L$( TO 4);AT 14,17;L$
( TO 4)
2010 PRINT AT 11,7;E$( TO 7);AT
11,17;E$( TO 7);AT 12,8;E$( TO 6
);AT 12,17;E$( TO 6);AT 13,9;E$(
 TO 5);AT 13,17;E$( TO 5);AT 14,
10;E$( TO 4);AT 14,17;E$( TO 4)
2012 NEXT n
2020 FOR n=0 TO 20: BORDER 3: FL
ASH 1: BORDER 5: FLASH 0: BEEP .
1,40: BEEP .02,35: NEXT n: LET h
=18
2028 BORDER 4: PAPER 4
2030 CLS : BORDER 4: FLASH 0: PA
PER 4: INK 1: PRINT AT 4,6;"**CO
NGRATULATIONS**";AT 7,1;"*YOUR G
YMNAST HAS REACHED THE*";AT 9,2;
"*MAXIMUM HEIGHT OF 19 UNITS*";A
T 13,6;"** IN ";j;" JUMPS. ** "
2040 PAUSE 250: CLS : GO TO 1015
2050 CLS : GO TO 20
2060 RETURN
6000 CLEAR 32999
6005 PRINT AT 10,10;"Please Wait
"
6010 DATA "A▒B'TC≡D◢": LET a$="1C
```

```
2A361C087F1F5D"+"5D5D5D141414141
4"+"FF00FF00FF00FF00"+"0103070F1
F3F7FFF"
6012 DATA "E◆F◆G≡H≠": LET a$=a$+
"1C3E6B7F63361C08387CFAFFE07E3C3
8800E000F800FE00010007001F007F0
0"
6014 DATA "I▒J◆K◆L▒": LET a$=a$+
"FF7F3F1F0F0703010000 3C7EFF7E3C1
81C3E5FFF7F0E7C189DBDEAFEE2BFBDC
8"
6020 FOR l=0 TO 12*8-1
6030 LET a=PEEK 23675+256*PEEK 2
3676
6040 LET c=16*(CODE a$(1)-48)+CO
DE a$(2)-48-7*16*(CODE a$(1)>=65
)-7*(CODE a$(2)>=65)
6050 POKE a+l,c
6060 LET a$=a$(3 TO )
6070 NEXT l
6080 CLS : GO TO 20
6090 RETURN
9900 SAVE "tramp" LINE 15
```



How the game looks in action

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Horse Racing

This program asks you to enter your stake, the odds and the name of the horse you are backing and then calculates your winnings. If you wish, it will then transfer your winnings onto the next horse — if you are lucky enough to back two winners in a day.

When asked for odds, enter in the form 3/1, 7/2, 9/4 and so on. A decimal point should be placed before pence.

This program could also be used for other forms of racing, greyhounds, for example.

```
  1 REM HORSE RACING
 10 PRINT AT 13,9;"HORSE RACING
"
 12 PAUSE 400
 16 CLS
 20 PRINT AT 13,9;"ENTER STAKE"
 30 INPUT A
 31 GOTO 40
 32 LET A=C
 40 PRINT AT 14,9;"ENTER ODDS"
 50 INPUT B
 53 PRINT AT 15,5;"ENTER HORSES
 NAME"
 54 INPUT D$
 55 CLS
 60 LET C=A*B+A
 65 PRINT AT 13,0;D$;" £";A;" A
T ";B;" TO 1"
 66 PAUSE 200
 70 PRINT "YOUR WINNINGS ARE"
 80 PRINT "£";C
 85 PAUSE 200
 90 PRINT "HAVE YOU ANY MORE WI
NNERS"
 95 PRINT "YES OR NO"
100 INPUT Z$
102 CLS
105 IF Z$="YES" THEN GOTO 32
108 CLS
110 PRINT AT 13,0;"YOUR TOTAL W
INNINGS"
120 PRINT AT 14,0;"FOR TODAY =
£";C
130 STOP
```

Gas Bill

Check your gas bill and/or work out how much your next bill will be by entering your present meter reading along with the reading on your last bill, plus information like pence per therm and standing charge. All this will be on your bill.

```
  1 SAVE "GAS BIL■"
  5 PRINT "GAS CALCULATION"
 10 PAUSE 300
 15 CLS
 20 PRINT "ENTER PRESENT METER
READING"
 25 INPUT A
 30 PRINT "ENTER PREVIOUS READI
NG"
 35 INPUT B
 40 CLS
 45 LET C=A-B
 50 PRINT "CUBIC FEET USED = ";
C
 55 PRINT "ENTER B.T.U;S PER CU
.FT."
 60 INPUT D
 65 LET E=D/1000
 70 PRINT "ENTER PENCE PER THER
M"
 75 INPUT F
 80 LET H=F/100
 85 PRINT "ENTER STANDING CHARG
E"
 90 INPUT G
 95 LET I=C*E
100 PRINT "THERMS USED  =  ";I
105 PAUSE 300
110 CLS
280 LET J=(I*H)+G
281 LET J=(J*100)+0.5
282 LET J=INT J
283 LET J=(J/100)
290 PRINT AT 10,0;"THE TOTAL OF
THIS GAS"
295 PRINT AT 11,0;"BILL IS £";J
300 STOP
```

Electricity Bill

This program does just the same for electricity instead of gas and, again, the information needed will be on your last bell.

- Spaces must be left exactly as in the listings

```
  3 REM ELECTRICITY BILL
  5 PRINT "■■■■■■■■■■■■■■■■■■■■
■■■■■"
 10 PRINT "ENTER PRESANT METER
READING"
 15 INPUT A
 20 PRINT "ENTER PREVIOUS READI
NG"
 25 INPUT B
 30 CLS
 35 LET C=A-B
 40 PRINT "TOTAL UNITS= ";C
 41 PAUSE 200
 42 CLS
 45 PRINT "ENTER PENCE PER UNIT
"
 50 INPUT D
 55 LET E=D/100
 60 PRINT "ENTER FIXED CHARGE"
 65 INPUT F
 66 CLS
 70 LET G=(C*E)+F
 71 LET G=(G*100)+0.5
 72 LET G=INT G
 73 LET G=(G/100)
 80 PRINT AT 10,0;"THE TOTAL AM
OUNT OF THIS"
 85 PRINT AT 11,0;"ELECTRICITY
BILL IS £";G
 90 STOP
```

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Games Pack One BBC B £4.95

Logic Systems, 129 High Street, Cherry Hinton, Cambridge

Games Pack One is a collection of three programs written in BASIC. Firstly, Mastermind is the now classical number sequence guessing game, in which the player plays against the computer.

Sadly, unlike other games of this type, you cannot set the computer a problem to solve and data entry is very confusing.

The two graphics games, Ski-Run — a slalem (their spelling) course — and Car Maze, are variations on the theme where a player avoids upward scrolling obstacles by controlling speed and side-to-side direction.

The programs work, and are of the average standard of those found listed in magazines, but my only recommendation can be that they are cheap.

P.D.

instructions	60%
playability	30%
graphics	30%
value for money	60%

★ ★ ★

Pirates BBC 32K £9.25

Chalksoft, Lowmoor Cottage, Tonedale, Wellington, Somerset

This cassette contains two programs which are linked in theme and style.

One is a long adventure game in which various objects must be found, hazards overcome and secrets discovered which have to be solved before going on to the second. This is a shorter program meant to be completed at one sitting during which you explore an island.

The pirate theme is well maintained in both these programs and has a great deal of interest for children of all ages. I was a little surprised, however, that this program should claim to be educational.

It is certainly fun and would encourage language and decision making skills if played in a co-operative situation but I cannot say that it is what most poeple would regard as "proper education".

This said, the games are very well presented on a split screen format with attractive pictures, very cleverly constructed. Unfortunately the response time is a little slow, for me at least. You cannot turn the sound off either which is rather a pity.

Another feature of the game I didn't like was the restricted vocabulary designed to prevent a child having to spell anything.

D.C.

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

★ ★ ★ ★

Crazy Fruit BBC 32K £5.95

Logic Systems, 129 High Street, Cherry Hinton, Cambridge

Crazy Fruit is a one armed bandit game (with no arms at all!) and is implemented in Mode 7 graphics. The teletext shapes have great charm but can only be called low resolution and have a very chunky appearance indeed.

The only other fruit machine I have played on this computer (Superior Software's) had high resolution graphics and held my interest more for that reason. There is no doubt, however, that this program is very cleverly done.

The game has nudges, holds and you can even gamble the winnings against your reflexes by pushing the win button at just the right movement.

In fact, all the features you might desire from a fruit machine are here. I do however have serious doubts as to whether I would like to play this sort of game at all. It seems too distant from winning real money to me!

The only real quibbles I have with it are that there is no winning combination table (is it really so obvious to everyone?) and that it lets you 'hold' winning combinations on occasions. The ending of the game has the ominous warning "We'll send the boys round" if one loses or a more cheerful message if one wins, both of which amused me greatly.

D.C.

instructions	50%
playability	50%
graphics	50%
value for money	30%

★ ★

Draughts BBC 32K £5.95

Logic Systems, 129 High Street, Cherry Hinton, Cambridge

The playing of board games on computers is an old sport going back as far as the very beginnings of computing itself. The ability to teach a machine to be a "clever" opponent has long been a prized goal.

This program goes a long way toward that goal and plays a very good game indeed. There are two levels of play and I found even level one very hard to beat.

The graphics are very clear indeed and there is no doubt as to how to use the board markings or who owns the playing pieces. The use of only black and white makes the game even clearer. I know it could have been multicoloured and some people like this, but in this case it helps concentration very much.

Even more important than the graphics is the speed of response. This game is excellent in this respect — it's very fast indeed. And, what's more, it tells you what it is considering, while it is calculating its next move. I found the timing displayed on screen very off-putting as mine was always the longer, by a factor of 10 usually.

The one major criticism I have is that it cheats! It can take a follow through move (after taking one piece to take another) but you can't and if you try to it takes your piece away. Now that's what I call really human behaviour!

D.C.

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

★ ★ ★ ★

Escape From Moonbase Alpha BBC 32K £7.95

Program Power, 8/8a Regent Street, Chapel Allerton, Leeds LS7 4PE

This 3D graphic adventure loads in four parts. Comprehensive instructions are displayed by the program but these become a frustration once familiar with the game as they are displayed automatically on loading

The game is fun to play and features impressive graphics and a host of characters. It is a pleasant change from the rather dry narrative adventure games.

You control the movement of Joey who has been left abandoned on Moonbase Alpha. His only escape is to locate the Doctor down on level seven and, if enough bags of gold have been collected on the way, the Doctor will transport him away in the Tardis.

This all sounds nice and easy, until you stumble across Deadly Doris, metal maulers, green grapplers, the Demon and the Wizard. Or, worse still, you could encounter Marvin, the paranoid android, and be bored to death. If you get into a sticky situation you can always take a hulk pill and turn Joey into the Incredible Hulk for five seconds.

A couple of minor criticisms are the choice of keys for moving Joey around, and the pause between changing rooms is sometimes frustrating.

D.H.

instructions	80%
playability	85%
graphics	90%
value for money	85%

★ ★ ★ ★

Will you get to the treasure first?

There are more dangers than just a bloodthirsty pirate in Lance Booth's Treasure Island game for the standard TI-99/4A. Type it in and try for a chestful of doubloons

Hidden somewhere on Treasure Island is a chest crammed with gold. Can you find it before the pirate, who is also scouring the island?

You must use your skill and judgement to work out the location of the treasure, using the clues provided.

Then use the arrows keys E S D X (with alpha lock button down) to go and find it.

The clues will tell you how far, in whole squares, the treasure is from the mountains and the jungle. When the treasure doesn't turn out to be where you thought it was, the game can become quite frustrating and addictive.

The pirate is armed to the teeth, so if you meet him you won't stand a chance. There are other dangers to watch out for too, so take care.

You can alter the difficulty level in two ways.

First, remove lines 900 and 910. This will cause the game to start as soon as the screen display is complete, rather than waiting for you to initiate play.

Alternatively, the number of swamps can be increased by raising the value of the FOR...TO statement at line 720. This will mean concentrating on negotiating the swamps as much as on finding the treasure and avoiding the pirate and the other dangers.

When each turn is over — whatever the reason — the location of the treasure is displayed. X marks the spot where it was hidden.

How it works

120-170 define characters
180 sets screen colour
190-270 set character colours
290 random numbers
300-350 set fixed variables
360-370 check treasure not in jungle
380-390 calculate distances to treasure
400 clears screen
410-510 display clues
590-810 display island and landscape
820 hides treasure
830-840 initial pirate location
850 stores old character at pirate square
860-870 initial player location
880-890 initial pirate and player display
900-910 wait for player to start
920-930 initial pirate direction
950-1260 main game sequence
950 check keyboard
960 clears old player
970-1040 check for movement
1050 checks new square
1070-1130 check for special situations
1140 displays new player
1150 clears old pirate
1160-1170 move pirate position
1180 checks new pirate square, stores old character
1190-1200 check for special situations
1210-1220 check pirate still on island
1230 displays new pirate
1240-1250 sound effects
1260 sends program back to start of game sequence
1270-1310 change pirate direction if needed
1320-1340 fell in sea
1350-1370 fell in river,
1380-1400 fell in swamp
1410-1430 lost in jungle
1440-1460 lost in moutains
1470-1490 pirate caught you
1500-1520 pirate found treasure
1530-1550 sound effects
1560-1670 you found gold
1680-1700 display message
1710-1740 play again ?
1750 end

```
100 REM  TREASURE ISLAND
110 REM  BY LANCE BOOTH
120 CALL CHAR(97,"FFFFFFFFFFFFFFFF")
130 CALL CHAR(96,"00001054387C")
140 CALL CHAR(128,"003C7E7E3C1818")
150 CALL CHAR(136,"0018183C3CFEFE")
160 CALL CHAR(144,"1010385410282B6C")
170 CALL CHAR(152,"3C5A7E3C18661866")
180 CALL SCREEN(5)
190 CALL COLOR(2,4,4)
200 FOR I=3 TO 8
210 CALL COLOR(I,16,2)
220 NEXT I
230 CALL COLOR(9,5,4)
240 CALL COLOR(13,13,4)
250 CALL COLOR(14,7,4)
260 CALL COLOR(15,16,4)
270 CALL COLOR(16,2,4)
280 REM  SET VARIABLES
290 RANDOMIZE
300 JR=INT(15*RND)+5
310 JC=INT(12*RND)+16
320 MR=INT(17*RND)+4
330 MC=INT(12*RND)+14
340 TR=INT(18*RND)+4
350 TC=INT(17*RND)+14
360 IF (TR<JR-1)+(TR>JR+2)THEN 380
370 IF (TC>JC-2)*(TC<JC+2)THEN 340
380 X=INT(SQR((TC-JC)*(TC-JC)+(TR-JR)*(TR-JR)))
390 Y=INT(SQR((TC-MC)*(TC-MC)+(TR-MR)*(TR-MR)))
400 CALL CLEAR
410 PRINT "TREASURE"
420 PRINT
430 PRINT Y;" FROM"
440 PRINT
450 PRINT "MOUNTAINS"
460 PRINT
470 PRINT X;" FROM"
480 PRINT
490 PRINT "JUNGLE"
500 PRINT
510 PRINT "CAN YOU"
520 PRINT
530 PRINT "FIND IT"
540 PRINT
550 PRINT "BEFORE THE"
560 PRINT
570 PRINT "PIRATE"
580 REM  DISPLAY ISLAND
590 FOR R=4 TO 21
600 CALL HCHAR(R,14,43,17)
610 NEXT R
```

Hints on conversion

The program should convert fairly easily to any computer with user-defined characters. Here is an explanation of some of the TI BASIC commands I have used:

CALL CHAR (ASCII code number, hexadecimal string) defines characters used in the program. The 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 COLOUR (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

```
620 CALL VCHAR(15,13,43,5)
630 CALL HCHAR(3,13,43,4)
640 CALL HCHAR(3,23,43,9)
650 CALL VCHAR(2,31,43,11)
660 CALL HCHAR(22,19,43,9)
670 REM  DISPLAY LANDSCAPE
680 CALL HCHAR(JR-1,JC-1,128,4)
690 CALL HCHAR(JR,JC-2,128,4)
700 CALL HCHAR(JR+1,JC-2,128,5)
710 CALL HCHAR(JR+2,JC-1,128,4)
720 FOR I=1 TO 10
730 SR=INT(18*RND)+4
740 SC=INT(17*RND)+14
750 CALL GCHAR(SR,SC,GET)
760 IF GET<>43 THEN 730
770 CALL HCHAR(SR,SC,96)
780 NEXT I
790 CALL HCHAR(MR,MC,136,5)
800 CALL VCHAR(4,20,97,4)
810 CALL VCHAR(7,19,97,6)
820 CALL HCHAR(TR,TC,44)
830 PR=INT(17*RND)+5
840 PC=INT(15*RND)+15
850 CALL GCHAR(PR,PC,GETP)
860 HR=22
870 HC=23
880 CALL HCHAR(PR,PC,152)
890 CALL HCHAR(HR,HC,144)
900 CALL KEY(3,K,S)
910 IF S=0 THEN 900
920 RDIR=1
930 CDIR=1
940 REM  GAME
950 CALL KEY(3,K,S)
960 CALL HCHAR(HR,HC,43)
970 IF K<>83 THEN 990
980 HC=HC-1
990 IF K<>68 THEN 1010
1000 HC=HC+1
1010 IF K<>69 THEN 1030
1020 HR=HR-1
1030 IF K<>88 THEN 1050
1040 HR=HR+1
1050 CALL GCHAR(HR,HC,GETH)
1060 REM  POSITION CHECK
1070 IF (GETH=32)+(GETH=31)THEN 1320
1080 IF GETH=97 THEN 1350
1090 IF GETH=96 THEN 1380
1100 IF GETH=128 THEN 1410
1110 IF GETH=136 THEN 1440
```

```
1120 IF GETH=152 THEN 1470
1130 IF GETH=44 THEN 1500
1140 CALL HCHAR(HR,HC,144)
1150 CALL HCHAR(PR,PC,GETP)
1160 PC=PC+CDIR
1170 PR=PR+RDIR
1180 CALL GCHAR(PR,PC,GETP)
1190 IF GETP=44 THEN 1500
1200 IF GETP=144 THEN 1470
1210 IF (PC<14)+(PC>30)THEN 1270
1220 IF (PR<4)+(PR>21)THEN 1300
1230 CALL HCHAR(PR,PC,152)
1240 CALL SOUND(100,110,0)
1250 CALL SOUND(100,220,0)
1260 GOTO 940
1270 CDIR=-CDIR
1280 IF (PR<4)+(PR>21)THEN 1300
1290 GOTO 940
1300 RDIR=-RDIR
1310 GOTO 940
1320 GOSUB 1530
1330 M$="THE SHARKS IN THE SEA ATE YOU"
1340 GOTO 1680
1350 GOSUB 1530
1360 M$="YOU DROWNED IN THE RIVER"
1370 GOTO 1680
1380 GOSUB 1530
1390 M$="YOU FELL IN THE SWAMP"
1400 GOTO 1680
1410 GOSUB 1530
1420 M$="YOU'RE LOST IN THE JUNGLE"
1430 GOTO 1680
1440 GOSUB 1530
1450 M$="YOU'RE LOST IN THE MOUNTAINS"
1460 GOTO 1680
1470 GOSUB 1530
1475 CALL HCHAR(PR,PC,152)
1480 M$="THE PIRATE CAUGHT YOU"
1490 GOTO 1680
1500 GOSUB 1530
1510 M$="THE PIRATE FOUND THE TREASURE"
1520 GOTO 1680
1530 REM  FAILURE MUSIC
1540 FOR N=-8 TO -1
1550 CALL SOUND(+350,N,0)
1560 NEXT N
1570 RETURN
1580 REM  SUCCESS
1590 RESTORE 1640
```

```
1600 READ TONE,DRN
1610 IF DRN=0 THEN 1670
1620 CALL SOUND(DRN,TONE,0)
1630 GOTO 1600
1640 DATA 392,300,392,300,440,300,370,450,392,150,440,300
1650 DATA 494,300,494,300,523,300,494,450,440,150,392,300
1660 DATA 440,300,392,300,370,300,392,900,0,0
1670 M$="YOU'RE RICH YOU FOUND THE GOLD"
1680 FOR J=1 TO LEN(M$)
1690 CALL HCHAR(2,1+J,ASC(SEG$(M$,J,1)))
1700 NEXT J
1710 PRINT
1715 CALL HCHAR(TR-1,TC,88)
1720 INPUT "WANT TO PLAY AGAIN? ":A$
1730 IF SEG$(A$,1,1)="Y" THEN 280
1740 IF SEG$(A$,1,1)<>"N" THEN 1720
1750 END
```

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How you can crack the code

If you want to move into machine code on your VIC, Allen Webb tells you the whys and wherefores of assemblers and monitors

Most VIC owners will find that BASIC is a perfectly good language for most applications. Occasionally, however, you need some extra speed, and it's at times like that when you could do with a nice machine code routine.

Assuming that you know how to write the routine, for very short routines it is feasible to enter the code directly.

For programs of any length, though, an assembler is invaluable. In this article, I plan to describe what assemblers are, which type is suitable for which user and discuss some of the commercially available assemblers.

But first, for non-users of machine code, here's a thumbnail sketch of the problem. Many VIC users will appreciate that BASIC, as a high level language, is not the actual language understood by the processor.

As far as the processor is concerned, its instructions consist of binary numbers stored in memory. While these instructions are readily understood by the processor, they mean nothing to us poor humans. In order to make life simpler, a set of mnemonics was developed.

These mnemonics consist of three-letter codes which describe the instruction, eg the mnemonic for 'Load X register' is LDX, and the mnemonic for 'Return from subroutine' is RTS.

Clearly, LDX and RTS are easier to understand than the corresponding machine codes ($R2 and $60 respectively). Using the system of mnemonics it is straightforward to write the preliminary or source code.

You then have to convert the source code to the machine code that the processor can understand. This is done by a program called an assembler (because the source code is assembled, the mnemonic system is often called assembly language). The assembled code is usually called the object code.

Listing 1 gives an example source code. The two columns on the extreme right are the mnemonic representation of the program. The hexadecimal numbers are the converted machine code values.

OK, so now we know why we need assemblers. The clever thing about most assemblers is that they have little extras which make life even easier.

Consider the situation where your routine uses a number of memory locations to store data. Rather than force you to remember the values of such locations, you can name them (cf declaring variables in BASIC). Lines 10 to 19 in listing 1 show how this is done.

Similarly, you can name labels for looping (eg lines 220, 330 and 395).

In order to deal with all these labels and names, this type of assembler converts the source code to object code in two steps. Consequently these are called 'two pass' assemblers.

There are a number of simpler 'one pass' assemblers on the market which can be used to produce an object code. They have the restriction that you cannot use names for locations or labels for jumps or loops.

One other item I should mention is the machine code monitor.

Owners of the Commodore PET are fortunate in that their machines (except the first series) have a monitor in ROM. VIC and Commodore 64 owners are not so fortunate.

OK, so what is a monitor? Well, it's simply a program (normally in machine code) which makes the manipulation of RAM contents easy.

The basic monitors normally enable you to examine and change the contents of RAM, save and load programs and data direct from and to RAM, to examine and change the registers and execute machine code routines direct. In all, a very handy tool.

So what is there on the market? I will describe two packages, both in cartridges, which give examples of both one and two pass assemblers.

A very good example of a two-pass assembler is the Mikro Assembler (made by Supersoft and marketed by Audiogenic). This is a large packaged offering some 16K of ROM and 3K of RAM. This cartridge offers a perfect environment for the assembly and disassembly of machine code routine as well as commands of high resolution graphics, a simple monitor and other useful commands.

The assembler is two-pass and supports labels and names of unlimited length, the usual extra commands (eg the greater than and less than signs for least and most significant bytes) and pseudo op-codes for word tables (BYT, TXT and BYT).

Numerical values can be entered in decimal, hexadecimal, octal or binary. In all, an excellent assembler, of quality comparable to more expensive packages.

Because of the slowness of cassette storage, all assembly occurs in RAM. The BASIC editor is used to create the source code (this can be saved or loaded in the same way as a BASIC program). On assembly, the source code is assembled and the object code placed in RAM at the required location.

In all, a very convenient and simple system. The machine code can be saved, loaded or examined using the monitor. You can examine any coding in memory with a built in disassembler.

If you have a printer, you can get a hard copy of the source and object codes and any disassembly (Listing 1 was produced by the Mikro assembler).

The main problem of direct assembly to RAM is that you cannot locate code at an area outside your RAM. In addition, if you want to create a program of a decent size, you really need 16K RAM.

You can't use more than 16K expansion because part of the Mikro ROMs sit at $6000 (although you can assemble code above $6000 by use of the spare created during assembly).

The extra commands with the package allow you to use high resolution graphics to plot lines and dots. There are a number of commands to enable you to pass values to and from the internal registers; a very handy facility.

An equally useful command is NUMBER which will perform conversions between the four possible bases.

Overall, the Mikro assembler is an excellent package which is worth considering if you plan some serious work in machine code.

If the assembler is so clever, why buy a monitor? Well, although the Mikro assembler contains a simple monitor, for advanced manipulation of code and memory a full blown monitor is the only answer. The Commodore monitor cartridge is one such package.

In addition to the simple commands for saving, loading and examining and moving code, the package contains a range for more advanced fun and games.

First there is a single-pass assembler. This is really only any use for short machine code routines.

As a useful extra to disassembly, there are commands that allow you to search for specific bytes and decode ASCII characters.

By far the most useful commands are for step by step running of code. This allows you to debug your masterpiece without the risk of a crash. You can set breakpoints which help this activity.

There are a range of other commands which makes this package a most powerful tool.

Right, here comes the crunch. Which type of product do you buy? Ideally, given the cash, the answer is both. ▶

Summary

Product	Medium	Addresses	Facilities	Cost	Supplier
			Assembler (2 Pass)		Audiogenic PO Box 88
Mikro Assembler	Cartridge	$6000, $A000	Disassembler Graphics Tiny Monitor Various other commands	£48.95	Reading Berks
CBM Monitor	Cartridge	$7000	Monitor, Assembler (1 Pass) Disassembler Trace. Other commands	£34.95	Commodore Most retailers

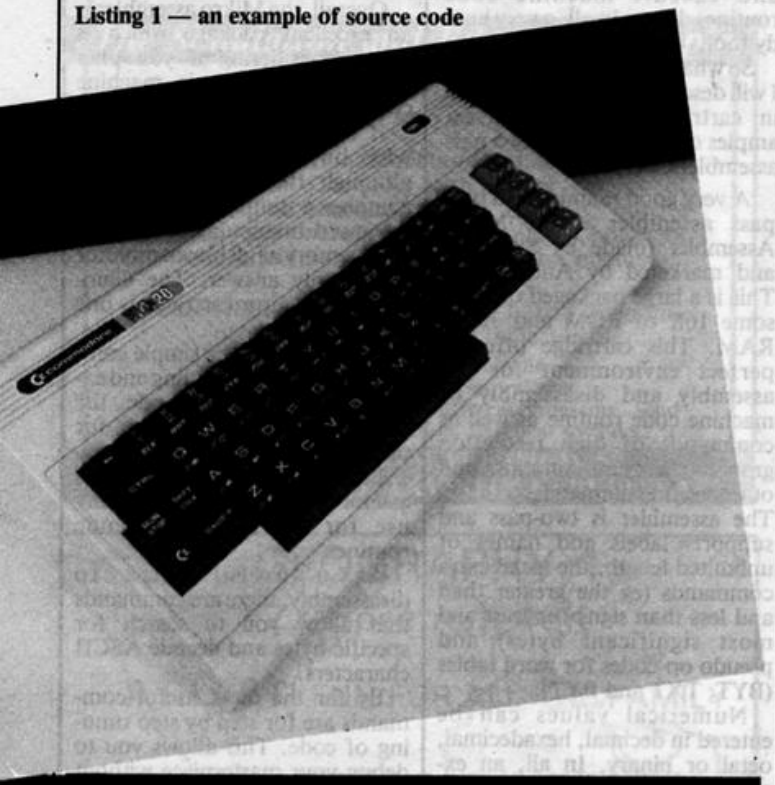
VIC-20 PROGRAMMING

Allowing for the limited resources of the average VIC owner, my answer is "if you are new to machine code, the Commodore monitor is a good choice since most of your routines will be short, and you will need to debug your programs.

If you are an experienced machine code user, though, the assember package would be best. Overall, I can recommend both packages as being good value and reliable products.

```
 10  0400           CBUF=$0400
 11  0500           VBUF=CBUF+$100
 12  0520           NBUF=VBUF+$20
 13  0540           COML=NBUF+$20
 14  0541           VL=COML+$1
 15  0542           NL=VL+$1
 16  0543           COUNT=NL+$1
 17  0544           VERBNO=COUNT+$01
 18  FFF0           CURS=$FFF0
 19  0545           NOUNO=VERBNO+$01
 30  033C           *=$4000
200  4000  A200              LDX  #0
210  4002  A920              LDA  #32
220  4004  9D0005    L0      STA  VBUF,X
230  4007  9D2005            STA  NBUF,X
240  400A  E8                INX
250  400B  E020              CPX  #32
260  400D  D0F5              BNE  L0
270  400F  A900              LDA  #0
280  4011  8D4105            STA  VL
290  4014  8D4205            STA  NL
295  4017  8D4505            STA  NOUNO
300  401A           !SPLIT COMMAND INTO VERB & NOUN
310  401A           !
320  401A  A200              LDX  #00          ! FIND VERB
330  401C  BD0004    L1      LDA  CBUF,X
340  401F  C920              CMP  #32
350  4021  F009              BEQ  L2
360  4023  9D0005            STA  VBUF,X
370  4026  E8                INX
380  4027  EC4005            CPX  COML
390  402A  D0F0              BNE  L1
395  402C  8E4105    L2      STX  VL
400  402F  EC4005            CPX  COML         !IS THERE A NOUN?
410  4032  D003              BNE  L3
```

Listing 1 — an example of source code



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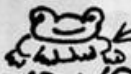

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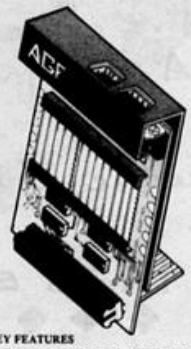

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The Interface Module II resides in the same memory space as the keyboard, which remains fully functional at all times, therefore it will not interfere with anything else connected.

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Take a look at the selection of compatible games we have listed. More are being added all the time as a result of our contact with the various software companies.

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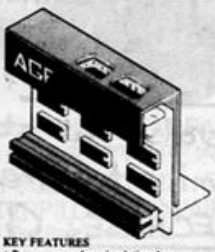

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Our reaction to this action

Our reviewers rate these arcade-style games for a range of micros

City Patrol ZX81 16K £4.95

Macronics, 26 Spiers Close, Knowle, Solihull, W. Midlands

The graphics are very good, and a welcome change from target-type games such as Invaders or Asteroids.

You are in command of a laser-firing ship zooming among the skyscrapers of a large city, trying to intercept and destroy the aliens which are descending to destroy the buildings.

The skyscrapers, in four 'layers', appear to pass across the screen in different directions according to your use of the controls.

The motion is, in the style of the ZX81, a bit jerky; but the 3D effect is good. Nearby buildings pass quickly, distant ones appear to go slowly.

The aliens, of course, fire back. There are 'lightning' effects as they fire their guns and if they manage to land they destroy a chunk of city. (They can also destroy you.)

Be warned — the aliens are not easy to catch. You can zoom past them and then have to return and search them out among the buildings!

City Patrol is a straightforward game to play; it keeps score but does not offer different skill levels. But the format and the graphics make it a little different from most of the other games I've tried for the ZX81.

C.C-R.

instructions	75%
playability	80%
graphics	90%
value for money	70%

★ ★ ★ ★

Vultures Dragon £6.95

J. Morrison, 2 Glendale Street, Leeds LS9 9JJ

A very professional product, 100% machine code and auto-running during loading. The cassette comes packaged in a smart 'mini-video' type case, with an impressive sleeve depicting a bright red vulture protecting its eggs.

As with most good arcade style games, the idea behind it is simple — kill the flock of vultures as they swoop to destroy you.

However when you clear them from the sky, half a dozen eggs begin to hatch, each with an impressive noise.

These 'super vultures' are harder to dispose of, as they change colour and home in on you.

They can only be killed whilst they are in their original colour and if you survive, the speed increases with each successive screen, so the vultures are bound to get you in the end!

You will, however, have the posthumous pleasure of recording the high score on screen.

The game is in colour with excellent graphics and is also very effective in black and white.

It requires one joystick, which is also used to select the speed of play, using a neat moving cursor routine.

Vultures can be recommended to arcade addicts of all ages. E.C.

instructions	80%
playability	95%
graphics	85%
value for money	90%

★ ★ ★ ★ ★

Panic 64 Commodore 64 £7

Interceptor Micros, Lindon House, The Green, Tadley, Hants

Panic 64 is a ladder game for the Commodore 64.

With your bombs you blast holes in the different levels which you then have to entice the monsters to fall through. The higher the levels, the more floors they have to fall through to meet their doom.

An enjoyable game with good instructions and active on tactics to help you score a bonus but we did have a couple of problems.

Several times after escaping our pursuers and getting the holes lined up, the monsters suddenly got into a circuit from which they could not be enticed so as to fall through our trap.

The only way to break out of the pattern was to sacrifice a life — bad enough, but as this occurred mainly at the higher levels it was sometimes your last life.

We did manage to corrupt one of the sprites which make up the man and it made it very difficult to line him up on the ladders. I'm not sure how we did this but it did mean reloading the program and starting again.

A joystick makes life easier but is not essential, as in many other games. Get rid of the bugs and value for money is much improved.

B.P.

instructions	80%
playability	20%
graphics	80%
value for money	30%

★ ★

Dodo 48K Spectrum £5.95

Blaby Computer Games, Crossways House, Lutterworth Rd, Blaby, Leicester

This is a version of the arcade game Pengo, in which your character, transformed from a penguin to a dodo — presumably for copyright reasons — has to avoid a swarm of Snow Bees.

The playing area is a rectangular random maze of ice blocks. Both Dodo and the bees can destroy the blocks, but Dodo can also push a single block which slides along the screen squashing any bees in its path. If any bee is touching an ice block which Dodo destroys, then the bee is also destroyed.

The cassette insert is amusing, the instructions are supplied on an extra piece of card and are clear and nicely presented, although containing a few grammatical errors.

The game is fast and needs very quick reactions. Graphics, colour and sound are excellent, but movement is of the jerky, square to square variety.

You have a choice of keyboard or Kempston/AGF joystick controllers, the keys are the "arrow" keys 5,6,7, and 8 and need some practice to master. Response is good, but you need the joystick to get really high scores.

R.E.

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

★ ★ ★ ★

Space Hi-Way BBC B £8.56 (tape) £9.70 (disc)

Amcom, 23 Hivings Hill, Chesham, Bucks HP5 2PG

A healthy mixture of arcade ideas combine as you play the harassed owner of a galactic fuel station.

Armed only with your trusty doublesupersaturated-photonplasmalasertranscentalblaster (!), which varies its power when low on charge, you must stop marauding gangs of four different types of aliens from stealing your fuel and destroying you in the process.

All very well, but passing fuel tankers refuse to land and must be shot out of the sky — by carefully destroying their lifting pods and then catching them as they fall.

All this, plus mutating aliens and the danger of running out of fuel, make Space Hi-Way a well balanced 'fun' game worthy of greatness. I enjoyed it thoroughly.

P.D.

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

★ ★ ★ ★ ★

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Can you play your cards right?

Polish up your prowess at Pontoon with Michael Plows' program for any Spectrum

How it works

20 loads graphics
30-80 sets up initial values for variables
85-230 deals player's cards
240-280 deals dealer's cards
285-295 decides who has won
300-360 end game titles
400-540 subroutine to select a card at random and check if it has been used, then set suits and add value to total score
1100-2300 print subroutines for each card
2500-2530 card descriptions to read into pack array

Whether you're short of a partner to play cards with, or whether you just want to get some practice, my game is for you. It plays a standard game of pontoon, recognising pontoons and five card tricks.

Type in the BASIC program first and save on tape using SAVE "PONTOON" LINE 1.

Then use a simple loader such as the one below to enter the graphics and save on tape after the program using SAVE "SET A" CODE USR "a", 168.

This is the loader:

```
10 FOR N=0 TO 20
20 FOR X=0 TO 7
30 INPUT Z: POKE 32600+(N*8)+X,Z
40 NEXT X: PRINT CHR$ (144+N);"(one space)";:NEXT N
50 STOP
```

The machine code for the graphics is listed separately.

Variables

P cash left
B amount bet on hand
T total score (ace = 1)
TT total score (ace = 11)
Y player's final score
F number of cards in hand
R,Q print position for card
U flag for dealer's five-card trick
X flag for dealer's pontoon
Z flag for player's five-card trick
P$ pack of cards
S$ suit symbol

User defined graphics

A,B curves of chin
H,C,D,S suit symbols
E eye
M mouth
N nose
R beard
I,J,K,L diagonal half characters (queen's crown and king's beard)
P,Q,T,U diagonal quarter characters (not used)

```
  5 REM PONTOON
 10 RANDOMIZE
 20 LOAD "SET A"CODE USR "a",168
 25 GO TO 2500
 30 LET P=1000
 32 LET U=0: LET X=0: LET Z=0
 35 LET T=0: LET TT=0
 36 IF P<10 THEN GO TO 360
 40 BORDER 4: PAPER 4: CLS
 50 DIM P$(52,3): RESTORE 2500
 60 FOR I=1 TO 52: READ P$(I):
NEXT I
 80 LET A$="       ": LET B$="   "
: LET C$="  ": LET D$="       ": LET
 F=0: LET R=1
 85 GO SUB 400
 90 GO SUB (1000+(N*100))
 95 PAUSE 100
 100 PRINT ; PAPER 4; INK 0;AT 1
1,0;"YOU HAVE £ ";P: PAUSE 50
 120 PRINT ; PAPER 4; INK 0;AT 1
1,0;"HOW MUCH DO YOU WISH TO BET
?"
 130 INPUT B: IF B<10 THEN GO TO
 120
 140 IF B>P THEN PRINT ; PAPER 4
; INK 0;AT 11,0;"YOU ONLY HAVE £
";P;"              ": PAUSE 50: GO
TO 120
 150 GO SUB 400: GO SUB (1000+(N
*100))
 160 PRINT ; PAPER 4; INK 0;AT 1
1,0;"ANOTHER CARD?
": PAUSE 0
 170 IF IN 32766=247 THEN GO TO
200
 180 IF IN 57342=239 THEN GO TO
150
 190 GO TO 170
 200 PRINT PAPER 4;AT 11,0;"
          ": IF T>21 THEN GO TO 3
10
 205 IF TT=21 AND F=2 THEN LET X
=1
 206 IF F=5 THEN LET Z=1
 210 IF TT>T AND TT<22 THEN LET
Y=TT: GO TO 230
 220 LET Y=T
 230 LET R=12: LET F=0: LET T=0:
 LET TT=0
 240 GO SUB 400: GO SUB (1000+(N
*100))
 245 PAUSE 100:
 250 IF F<2 THEN GO TO 240
 260 IF T>21 THEN GO TO 300
 265 IF TT=21 AND F=2 THEN GO TO
 310
 266 IF F=5 AND T<22 THEN LET U=
1: GO TO 285
 270 IF TT>18 AND TT<22 THEN GO
TO 285
 280 IF TT<17 OR T<17 THEN GO TO
 240
 285 IF U=1 AND NOT X=1 THEN GO
TO 310
 286 IF Z=1 AND NOT U=1 THEN GO
TO 300
 287 IF X=1 THEN GO TO 300
 290 IF (T>=Y AND T<22) THEN GO
TO 310
 295 IF TT>=Y AND TT<22 THEN GO
TO 310
 300 PAPER 5: CLS : PRINT AT 10,
12;"YOU WIN": LET P=P+B: FOR N=0
 TO 30: BEEP .1,N: NEXT N: GO TO
 320
 310 PAPER 5: CLS : PRINT AT 10,
12;"YOU LOSE": LET P=P-B: FOR N=
0 TO -30 STEP -1: BEEP .1,N: NEX
T N
 320 PAUSE 50: PAPER 5: CLS : PR
INT AT 10,12;"ANOTHER GAME?":
 330 IF IN 57342=239 THEN LET T=
0: LET TT=0: GO TO 32
 340 IF IN 32766=247 THEN CLS :
PRINT AT 10,8;"YOU HAVE £";P;AT
12,6;"thank you for the game": S
TOP
 350 GO TO 330
 360 CLS : PRINT '"YOU HAVE LESS
 THAN £10 LEFT"'" AND ARE OUT OF
 THE GAME, SORRY": PRINT AT 10,1
0;"ENTER GOTO 30 ";AT 12,10;"FOR
 A NEW GAME": STOP
 400 LET A=INT (RND*52)+1
 410 IF P$(A)="000" THEN GO TO 4
00
 420 LET Q$=P$(A): LET P$(A)="00
0"
 430 IF Q$(3)="H" THEN LET S$="H
": INK 2
 440 IF Q$(3)="C" THEN LET S$="C
": INK 0
 450 IF Q$(3)="D" THEN LET S$="D
": INK 2
 460 IF Q$(3)="S" THEN LET S$="S
": INK 0
 465 LET E$=B$+S$+B$: LET F$=C$+
S$+C$+S$+C$
 470 LET N=VAL Q$(1 TO 2)
 500 IF N=1 THEN LET S=1: LET SS
=11: GO TO 530
 510 IF N>9 THEN LET S=10: LET S
S=S: GO TO 530
 520 LET S=N: LET SS=S
 530 LET T=T+S: LET TT=TT+SS
```

```
 540 RETURN
1100 LET Q=2+(6*F): PAPER 7
1110 PRINT AT R,Q;"A";D$;AT R+1,
Q;A$;AT R+2,Q;A$;AT R+3,Q;A$;AT
R+4,Q;E$;AT R+5,Q;A$;AT R+6,Q;A$
;AT R+7,Q;A$;AT R+8,Q;D$;"A"
1115 PLOT (Q*8)-1,175-((R*8)-1):
 DRAW 42,0: DRAW 0,-74: DRAW -42
,0: DRAW 0,74
1120 LET F=F+1: RETURN
1200 LET Q=2+(6*F): PAPER 7
1210 PRINT AT R,Q;"2";D$;AT R+1,
Q;A$;AT R+2,Q;E$;AT R+3,Q;A$;AT
R+4,Q;A$;AT R+5,Q;E$;AT R+6,Q;A$
;AT R+7,Q;A$;AT R+8,Q;D$;"2"
1215 PLOT (Q*8)-1,175-((R*8)-1):
 DRAW 42,0: DRAW 0,-74: DRAW -42
,0: DRAW 0,74
1220 LET F=F+1: RETURN
1300 LET Q=2+(6*F): PAPER 7
1310 PRINT AT R,Q;"3";D$;AT R+1,
Q;E$;AT R+2,Q;A$;AT R+3,Q;A$;AT
R+4,Q;E$;AT R+5,Q;A$;AT R+6,Q;A$
;AT R+7,Q;E$;AT R+8,Q;D$;"3"
1315 PLOT (Q*8)-1,175-((R*8)-1):
 DRAW 42,0: DRAW 0,-74: DRAW -42
,0: DRAW 0,74
1320 LET F=F+1: RETURN
1400 LET Q=2+(6*F): PAPER 7
1410 PRINT AT R,Q;"4";D$;AT R+1,
Q;A$;AT R+2,Q;F$;AT R+3,Q;A$;AT
R+4,Q;A$;AT R+5,Q;A$;AT R+6,Q;F$
;AT R+7,Q;A$;AT R+8,Q;D$;"4"
1415 PLOT (Q*8)-1,175-((R*8)-1):
 DRAW 42,0: DRAW 0,-74: DRAW -42
,0: DRAW 0,74
1420 LET F=F+1: RETURN
1500 LET Q=2+(6*F): PAPER 7
1510 PRINT AT R,Q;"5";D$;AT R+1,
Q;A$;AT R+2,Q;F$;AT R+3,Q;A$;AT
R+4,Q;E$;AT R+5,Q;A$;AT R+6,Q;A$
;AT R+7,Q;A$;AT R+8,Q;D$;"5"
1515 PLOT (Q*8)-1,175-((R*8)-1):
 DRAW 42,0: DRAW 0,-74: DRAW -42
,0: DRAW 0,74
1520 LET F=F+1: RETURN
1600 LET Q=2+(6*F): PAPER 7
1610 PRINT AT R,Q;"6";D$;AT R+1,
Q;A$;AT R+2,Q;F$;AT R+3,Q;A$;AT
R+4,Q;F$;AT R+5,Q;A$;AT R+6,Q;F$
;AT R+7,Q;A$;AT R+8,Q;D$;"6"
1615 PLOT (Q*8)-1,175-((R*8)-1):
 DRAW 42,0: DRAW 0,-74: DRAW -42
,0: DRAW 0,74
1620 LET F=F+1: RETURN
1700 LET Q=2+(6*F): PAPER 7
1710 PRINT AT R,Q;"7";D$;AT R+1,
Q;A$;AT R+2,Q;F$;AT R+3,Q;E$;AT
R+4,Q;F$;AT R+5,Q;A$;AT R+6,Q;F$
;AT R+7,Q;A$;AT R+8,Q;D$;"7"
1715 PLOT (Q*8)-1,175-((R*8)-1):
 DRAW 42,0: DRAW 0,-74: DRAW -42
,0: DRAW 0,74
1720 LET F=F+1: RETURN
1800 LET Q=2+(6*F): PAPER 7: PRI
NT AT R,Q;"8";D$;AT R+1,Q;F$;AT
R+2,Q;A$;AT R+3,Q;F$;AT R+4,Q;A$
;AT R+5,Q;F$;AT R+6,Q;A$;AT R+7,
Q;F$;AT R+8,Q;D$;"8"
1815 PLOT (Q*8)-1,175-((R*8)-1):
 DRAW 42,0: DRAW 0,-74: DRAW -42
,0: DRAW 0,74
1820 LET F=F+1: RETURN
1900 LET Q=2+(6*F): PAPER 7
1910 PRINT AT R,Q;"9";D$;AT R+1,
Q;F$;AT R+2,Q;E$;AT R+3,Q;F$;AT
R+4,Q;A$;AT R+5,Q;F$;AT R+6,Q;A$
;AT R+7,Q;F$;AT R+8,Q;D$;"9"
1915 PLOT (Q*8)-1,175-((R*8)-1):
 DRAW 42,0: DRAW 0,-74: DRAW -42
,0: DRAW 0,74
1920 LET F=F+1: RETURN
2000 LET Q=2+(6*F): PAPER 7
2010 PRINT AT R,Q;"10   ";AT R+1
,Q;F$;AT R+2,Q;E$;AT R+3,Q;F$;AT
 R+4,Q;A$;AT R+5,Q;F$;AT R+6,Q;E
$;AT R+7,Q;F$;AT R+8,Q;"   10"
2015 PLOT (Q*8)-1,175-((R*8)-1):
 DRAW 42,0: DRAW 0,-74: DRAW -42
,0: DRAW 0,74
2020 LET F=F+1: RETURN
```

```
2100 LET Q=2+(6*F): PAPER 7
2110 PRINT AT R,Q;"J";D$;AT R+1,
Q;S$+D$;AT R+2,Q;"  ▙▟  ";AT R+3,
Q;" ▐E E▌ ";AT R+4,Q;" ▜  N  ▛ ";AT R+
5,Q;" AMB ";AT R+6,Q;"   R   ";AT
R+7,Q;D$+S$;AT R+8,Q;D$;"J"
2115 PLOT (Q*8)-1,175-((R*8)-1):
 DRAW 42,0: DRAW 0,-74: DRAW -42
,0: DRAW 0,74
2120 LET F=F+1: RETURN
2200 LET Q=2+(6*F): PAPER 7
2210 PRINT AT R,Q;"Q";D$;AT R+1,
Q;S$+D$;AT R+2,Q;"UI KP";AT R+3,
Q;" ▐E E▌ ";AT R+4,Q;" ▜  N  ▛ ";AT R+
5,Q;" AMB ";AT R+6,Q;A$;AT R+7,Q
;D$+S$;AT R+8,Q;D$;"Q"
2215 PLOT (Q*8)-1,175-((R*8)-1):
 DRAW 42,0: DRAW 0,-74: DRAW -42
,0: DRAW 0,74
2220 LET F=F+1: RETURN
2300 LET Q=2+(6*F): PAPER 7
2310 PRINT AT R,Q;"K";D$;AT R+1,
Q;S$;" O  ";AT R+2,Q;"  ▙▟  ";AT
R+3,Q;" ▐E E▌ ";AT R+4,Q;" ▜  N  ▛ ";A
T R+5,Q;"  IMK ";AT R+6,Q;"   R   "
;AT R+7,Q;D$;S$;AT R+8,Q;D$;"K"
2315 PLOT (Q*8)-1,175-((R*8)-1):
 DRAW 42,0: DRAW 0,-74: DRAW -42
,0: DRAW 0,74
2320 LET F=F+1: RETURN
2500 DATA "01H","02H","03H","04H
","05H","06H","07H","08H","09H",
"10H","11H","12H","13H"
2510 DATA "01C","02C","03C","04C
","05C","06C","07C","08C","09C",
"10C","11C","12C","13C"
2520 DATA "01D","02D","03D","04D
","05D","06D","07D","08D","09D",
"10D","11D","12D","13D"
2530 DATA "01S","02S","03S","04S
","05S","06S","07S","08S","09S",
"10S","11S","12S","13S"
2600 BORDER 4: PAPER 4: CLS : BE
EP 1,20: PRINT AT 3,12;"PONTOON"
;AT 6,3;"YOU START WITH £1000 AN
D MUST BET AT LEAST £10 ON EACH
GAME";AT 10,10;"GOOD LUCK";AT 17
,1;"PRESS ANY KEY TO START"
2610 IF INKEY$="" THEN GO TO 261
0
2620 GO TO 30
```

Machine code for the graphics. Do not type in the five-figure numbers on the left. Press ENTER after keying in each number, working from left to right

```
32600  128  128   64   64   32
32605   16   12    2    1    1
32610    2    2    4    8   48
32615  192   56   56   16  214
32620  254  214   16   16    0
32625   16   56  124  254  124
32630   56   16    0    0   60
32635   90   60    0    0    0
32640    3   12   16   32   64
32645   64  128  128  192   48
32650    8    4    2    2    1
32655    1  102  255  255  126
32660  126   60   60   24  128
32665  192  224  240  248  252
32670  254  255  255  127   63
32675   31   15    7    3    1
32680    1    3    7   15   31
32685   63  127  255  255  254
32690  252  248  240  224  192
32695  128    0    0    0   40
32700  124   56    0    0    0
32705   40   40   40   68   56
32710    0    0    0   48   72
32715   72   48    0    0    0
32720    0    0    0    0  128
32725  192  224  240   15    7
32730    3    1    0    0    0
32735    0  255  126   60   24
32740    0    0    0    0   16
32745   56  124  254  254  214
32750  146   16  240  224  192
32755  128    0    0    0    0
32760    0    0    0    0    1
32765    3    7   15    0    0
32770    0    0    0    0    0
```

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A stunning action packed game with superb large animated graphics. Giant Space Hawks wheel and weave in intricate patterns as they drop their deadly homing mines which will destroy your base on contact. While you are busy defending yourself the Hawks will feed on your helpless population returning only their skulls. All M C game complete with high score table that will blow your mind with its graphics and sound effects.

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Make your printer do some useful work

Here's how to produce cassette inserts and neat-looking letters. Alan Blackham's programs run on the unexpanded VIC-20 with the 1515 printer

Mini Word Pro

You are asked for information about the person you are writing to, as the program prompts you.

When you press the up arrow to enter the letter you are told to get the printer ready and when you press return the letter is printed with your address at the top.

Put your address and phone number in lines 550-570.

Variables

N$ name
S$ street and number
T$ town
C$ city
A$ GETs
P$ post code
L%(1 to 500) the letter
X counter
I FOR loop

Hints on conversion

POKE 36879,8 sets the screen black
PRINT CHR$(14) puts micro into lower case
PRINT CHR$(8) stops switching between upper and lower case
POKE 198,0 clears keyboard buffer
POKE 204,0 flashes the cursor in a GET statement
OPEN 1,4 open the printer as a device
CMD 1 sends all output to the printer
SYS 64802 resets the computer

```
 1 REM   ********************
 2 REM   * ALAN BLACKHAM'S *
 3 REM   * MINI:WORD PRO   *
 4 REM   *                 *
 6 REM   ********************
 9 REM
 10 POKE 36879,8:PRINTCHR$(14):PRINTCHR$(8)
 12 PRINT CHR$(8)
 20 PRINT"■■■
```

```
670 PRINT:PRINT:PRINT
680 PRINT TAB(55)"ALAN BLACKHAM."
682 PRINT#1:CLOSE1
685 PRINT"■■■■■ PRESS SPACE TO STOP!":POKE198,0
687 OPEN 1,4
690 PRINT#1:PRINT#1
695 GETA$:IFA$<>" "THEN 690
697 CLOSE 1
710 PRINT"■■■■■■NOTHER LETTER( I OR /)":POKE 198,0
720 GETA$:IFA$=""THEN720
730 IF A$="Y"THEN RUN
735 PRINT"■■■■■.."
740 SYS 64802
```

Cassette Inserts

This program for the unexpanded VIC-20 with a VIC 1515 Printer allows you to make cassette inserts on your printer for your music tapes or program cassettes.

The program starts by asking you to enter all the titles of what is on the tape. When you have entered them all you enter 'OK' and you are then told to get the printer ready and then press RETURN. Then the insert is printed with a line around it which, when cut out, fits the cassette perfectly.

Hints on conversion

This program should work on any micro with a printer with minor alterations. The main things are:

POKE 36879,8 sets the screen to black

OPEN 1,4:Cmd 1 sets all prints to the printer

CLOSE 1 switches off the printer

POKE 36879,27 sets the screen to white with cyan border

Variables

T$ titles of what's on the tape
X counter
A$ input
I FOR loop
P position to print right side of box

```
1 REM **********************
2 REM * ALAN BLACKHAM'S *
3 REM * CASSETTE INSERTS*
4 REM *                 *
5 REM **********************
7 REM
10 POKE 36879,8
20 PRINT"■■■    CASSETTE INSERT"
25 PRINT"■■■■■■
```

ZX SPECTRUM & ZX81 EDUCATIONAL SOFTWARE

Spectrum Junior Education **£7.50**

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* Use the "draw" program to produce pictures, maps and diagrams.

Suitable for the 16K or 48K Spectrum. Program notes are supplied.

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This cassette contains four clearly presented revision/tutorial programs. The subject matter has been carefully structured to cover the most important aspects of:

* Elements, compounds and mixtures.
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SOFTWARE: 'TEVLINK' package provides 2-machine parallel link (2 Boards needed), overall speed about 8K DATA bytes/second with error checking. A PRINT SPOOLER is included (only 1 Board needed): connect printer port to VIA board on receiving micro and use normal LIST/PRINT etc.

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Jetting ahead

I have found a way to achieve a limitless score in Jet Pac by Ultimate Play The Game. In the fourth screen (where the planes attack you) you fly up and position yourself in the centre of the top right mooncloud.

This way none of the jets can reach you so you cannot be killed. In this screen you receive the points for any alien that crashes or blows up so by just leaving the program running the six digits in the top left can change continously while you can do whatever you want.

Using this technique I have achieved a score of 700,000 while normally I only get about 70,000.

In Planetoids, by Psion, there is also a way of getting a high score. What you do is position your ship in the left column of the screen where it will run half yellow. Any planetoid that goes over it will just clear that area of your ship. By turning you will be able to see it again.

I have gained scores of over 300,000 using this method, but it gets boring after a while.

Marcus Edwards
Bishop's Stortford, Herts

Quirks among the monsters

I have found a bug/quirk in Softek's Monsters In Hell (reviewed in HCW20). My top score is 5,624 kills and this was achieved in just under four hours by hammering away at all levels under where the monsters appear.

When they appear they will fall down all the levels and die. You only have to collect crosses. This, however, is not as simple as it seems. All action stops when a monster falls past the levels, taking about a second. This seems odd as no sound accompanies the fall.

I failed to see any demons after 65 kills (unless they were a different coloured Mad Monk shape as I was using a black and white Television at the time).

My holy power began to overwrite the "L" and then the "I" in "Lives". Once my Holy Power reached over 3,2767, it was made negative and each successive cross made it 100 nearer zero. As I was interested in what would happen when my power became nearer zero I carried on. I got it down to −263, picked up another cross and it stopped and asked me if I wanted another game?

This surprised me as I didn't know why the game had ended. If I had left by power to run out I should have made at least another few thousand kills. This was a good idea for a game but if the monsters always appeared at the same place, why didn't anyone at Softek think of doing what I did?

All that would be needed would be an essential ladder at the left hand side which, if my idea was used, would isolate the man on the lower floors and eventually making the crosses unreachable.

If software companies took as much care checking programs as they did promoting them, then the standard of programs on the market may be a little higher.

Rose Harris
Dunshalt, Copar, Fife

Frank Lech, sales and marketing director of Softek International, said: "We welcome feedback from customers — the more we get the happier we are. We really do appreciate public comment.

"Along with Firebirds, Monster in Hell is our best seller and Mr Harris' comments are the first of this nature that we have had.

"It may be that improvements can be incorporated but it is also possible that there is a technical fault. If he sends us the tape we will see if we come up with the same.

"We will put his comments to the programmer.

"It's very nice to hear of someone who has obviously thought about his criticism and put it into such cohesiv form."

Guitar tutor revisited

Thank you for reviewing my program Learn to Play Guitar in a recent issue.

Obviously, I am rather disappointed at the two star rating you gave it. However, I take heart from your comment that the section displaying chord patterns is an 'excellent reference'.

Further comments are:

1. The title of the program. I never intended this program to be sold as a complete guitar tutor to rival some of the excellent publicatioons on the market.

Rather, it was my intention that the program would provide a useful reference for aspiring musicians.

I was not consulted by Lasersound about the title nor the artwork for the cassette insert. I accepted that the program will not teach classical guitar — it was never intended to.

2. On-screen instructions. I agree that a lack of instructions in a program of this type is unforgiveable. When I sent the original program to Lasersound, they suggested a few alterations/ improvements which I could not incorporate within 16K without cutting out some feature.

The feature which had to be cut was the On-Screen instructions. I assumed that Lasersound would provide these instructions in printed form to complement the very basic on-screen instructions.

Obviously, I was wrong. I have written an instruction sheet and asked Lasersound to supply this with future copies of the program and to make it available to any existing customer who requests it.

3. The table which your reviewer could not understand. If playing the guitar by ear, you would soon notice that certain chords seem to occur together.

For instance, with a song in the key of 'G', other chords which will probably be used are 'C', 'D7' and 'Em'. These are known as the sub-dominate, dominate and relative minor.

If you have worked out the chords used in a particular tune, but the key is not suitable for your voice, you can transpose the tune into a suitable key by referring to this table, which provides the dominant, subdominant and relative minor for any key.

4. Tuning up. I agree that if you read the Spectrum manual you would be able to make the computer do this without the need to buy a ready made program, but then if you read the manual and play around with the computer for long enough, it is surprising what you can make it do.

5. LOADing problems. If the second part of the program refuses to load, try LOAD "part 2" (16K) or MERGE "part 2" (48K). If this is still unsuccessful, contact Lasersound.

I hope that this letter sets the record straight.

J. Douglas Barr, Paisley, Scotland

Top Ten programs for the ZX81

1	Chess	Sinclair (1)
2	Space Raiders	Sinclair (2)
3	Flight Simulation	Sinclair (4)
4	Football Manager	Addictive Games (6)
5	Fantasy Games	Sinclair (5)
6	Scramble	Quicksilva (–)
7	Asteroids	Quicksilva (9)
8	Espionage Island	Sinclair (3)
9	Defender	Quicksilva (7)
10	Ship of Doom	Sinclair (–)

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

Top Ten programs for the VIC-20

1	Arcadia	Imagine (1)
2	Wacky Waiters	Imagine (3)
3	Skyhawk	Quicksilva (2)
4	Cosmiads	Bug Byte (8)
5	Catcha Snatcha	Imagine (9)
6	Cosmic Crunch	Commodore (4)
7	Gridrunner	Llamasoft (5)
8	Sargon II Chess (cart.)	Commodore (7)
9	Frantic	Imagine (10)
10	Panic	Bug Byte (6)

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

Top Ten programs for the Spectrum

1	Jet Pac	Ultimate (3)
2	Tranz-Am	Ultimate (1)
3	Scrabble	Psion (4)
4	The Hobbit	Melbourne House (2)
5	Horace and the Spiders	Psion/M. House (8)
6	Flight Simulation	Psion (5)
7	Ah Diddums	Imagine (9)
8	3D Tanx	dk'tronics (7)
9	Chess	Psion (–)
10	Cookie	Ultimate (–)

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

Top Ten programs for the Dragon

1	The King	Microdeal (1)
2	Frogger	Microdeal (2)
3	Android Attack	Microdeal (3)
4	Space War	Microdeal (6)
5	Nightflight	Salamander (4)
6	Ring of Darkness	Wintersoft (8)
7	Planet Invasion	Microdeal (10)
8	Quest	Dragon (–)
9	Morocco Grand Prix	Microdeal (7)
10	Dragon Trek	Wintersoft (–)

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

How to hit out at your hardware

Aggravated at your computer? If you haven't you will be.

Well, aggravated users and programmers of the world, it is now time to fight back. Microfile Systems Corporation has come up with a little device called the Byte Bat.

This truly user friendly device is a piece of soft hardware (or hard software depending on your point of view) that will give you a satisfying but non-destructive way to get back at your computer.

The Byte Bat is made of foam rubber, is 17 inches long, and is shaped like an American Baseball bat. For a mere $9.95, you get the Bat itself, a user's manual, a Byte Bat badge, a poster showing how to use the Bat, and a decal that warns all who approach that "this computer-friendly liveware is protected by Byte Bat."

Its inventors hope that the device will be another monster seller similar to the Pet Rock. Already the firm has sold out its test run of 10,000.

Believe it or not, this device was designed by a former Texas Instruments engineer who fashioned the prototype out of packing foam. It became an instant success, put into use by numerous TI CAD engineers who took it out on their terminals when their programs crashed.

Four years of testing and product improvement went into the Byte Bat before it was released commercially. How can it fail to sell?

It is made of open-cell foam without a skin. Therefore it is so soft that it will not even get a key to depress on the average keyboard. If it did have a skin, it could possibly cause damage to disc drives or punch out the lights of an LED, for example.

A health and safety warning comes with the Bat, indicating that computer users under three years of age should be watched, so that they do not eat the Bat.

The Byte Bat is compatible, as far as I can tell, with all computers and systems, making it the first globally compatible piece of spongeware (foamware?), in concurrence with statements made by the manufacturer.

If your local dealer only carries computers and software that never create errors, you won't need one. Otherwise you can get one direct from the factory by sending Microfile $12.50 or ordering by phone.

Not having current address, the best I can do is provide you their toll-free phone in the U.S. Call the U.S. and then ask for (800) 227-3900. Or if you are out my way, in California you can call (800) 632-2122. Waddaya mean, it's the silly season? It's like this all the time out here.

★ ★ ★ ★

If you like doing graphics on your Tandy Model III, this program may interest you. It is called DRAW, and is a text and graphics editing package that allows you to design a graphics screen or draw a picture in conjunction with your computer and the Grafyx Solution board (both hardware and software are from the same vendor).

The program contains about 10,000 instructions and is written in assembly. By moving the cursor around the screen and entering simple one-letter command instructions, you can do a variety of graphics tasks using lines, points, boxes, or circles.

It is a very versatile system which allows you to alter point size, reverse images, move any section of the screen to any other section, delete sections, and save any or all of your work at any time.

Once you are satisfied, or must leave off for a while, you can either save you work to disc or tape or have it print out in hard copy on any one of 20 commonly used printers. The program comes with 12 high resolution graphics pictures and costs only $39.95.

I do not know what the necessary piece of hardware costs, but you can find out for yourself by writing or calling Micro-Labs, Inc, 902 Pinecrest, Richardson, Texas 75080, (214) 235-0915.

That's all for this week. See you next time.

Bud Izen
Fairfield, California

Another devastating new game from the fabulous Postern range.

Defeat the flock of marauding FIRE HAWKS.

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The colourful Postern range is available on a variety of micros. Write quantity of each game required in the boxes provided.

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Postern is always on the look out for any new games you might have developed.

Trapped! And there are things which don't want you to escape

Part 1

It is Halloween and you are trapped on the top floor of an old mansion house. There are strange and terrifying things that don't want you to escape so you have to use your skill and judgement to find the stairs and the way out.

This program is in four parts. parts one and two are this week and parts three and four will be in the next two weeks.

Part one is some instructions and a title page with user defined graphics.

How it works Part 1

30-97 draw title page
100-195 play random music, wait for pressed key
200-330 print instructions
400-430 load part two
9000-9050 prints a$
9100-9190 print title block
9200-9270 wait till key pressed
50000-60095 define user characters

The programs will work without this part if you aren't feeling energetic, but it gives the program a bit of atmosphere.

If you have an 8 or 16K RAM pack then part one won't work so just enter part two (it will work wihout part one).

Variables

A$ all gets
I counter in for loops
A data

Hints on conversion

Part one would be very hard to convert to another micro because it uses user defined graphics. But the game will work just as well without part one, anyway.

These are the first two parts of a four-part adventure written for the VIC-20, plus 3K of RAM by Alan Blackham. Part two will appear next week and the final part the week after. But you can start playing straight away . . .

There's evil lurking. A scene from Psycho II, starring Anthony Perkins

```
1 REM      ********************
2 REM      * ALAN BLACKHAM'S *
3 REM      *    HALLOWEEN    *
4 REM      *      PART 1     *
5 REM      *   (22/08/83)    *
6 REM      ********************
7 REM
10 POKE 36879,93:POKE 36869,240
20 GOSUB 50000:POKE 36869,255
30 REM
32 REM ****** TITLE PAGE ******
35 REM
40 REM ****** PRINT 'HALLOWEEN' ******
50 PRINT"
55 PRINT"
60 PRINT"
62 PRINT"
64 PRINT"
66 PRINT"
68 PRINT"
70 PRINT"
72 PRINT"
74 PRINT"
76 PRINT"
80 PRINT"
82 PRINT"
84 PRINT"
86 PRINT"
88 PRINT"
90 PRINT"
92 PRINT"
95 PRINT"
97 PRINT"
100 REM
102 REM ****** PRESS A KEY ******
105 REM
107 POKE 36878,7:POKE 198,0
110 FOR I=88 TO 95
120 POKE 36879,I
125 POKE 36876,INT(RND(1)*20)+200
130 FORR=1TO50:NEXT R
140 POKE 36876,0
150 GETA$:IFA$<>""THEN 190
160 NEXT I
170 POKE 36874,INT(RND(1)*30)+200
180 GOTO 110
190 POKE 36874,0
195 POKE 36878,15
200 REM
202 REM ****** INSTRUCTIONS ******
205 REM
```

```
210 POKE 36869,240
220 POKE 36879,8
225 POKE 52,29:POKE 56,29
230 GOSUB 9100
235 A$="YOU ARE IN A SPOOKY":GOSUB 9000
240 A$="MANSION HOUSE.":GOSUB 9000
245 A$="IT IS HALLOWEEN AND":GOSUB 9000
250 A$="TO ESCAPE YOU MUST":GOSUB 9000
255 A$="FIND YOUR WAY DOWN":GOSUB 9000
260 A$="THE STAIRS AND OUT.":GOSUB 9000
270 GOSUB 9200:GOSUB 9100
275 A$="BUT BEWARE !":GOSUB 9000
280 A$="YOU NEVER KNOW WHO OR":GOSUB 9000
285 A$="WHAT YOU WILL MEET":GOSUB 9000
287 A$="ON HALLOWEEN.":GOSUB 9000
297 GOSUB 9200:GOSUB 9100
300 A$="YOU HAVE SEVERAL":GOSUB 9000
310 A$="COMMANDS INCLUDING":GOSUB 9000
315 A$="GO , GET AND DROP":GOSUB 9000
317 A$="LOOK = WHAT YOU ARE":GOSUB 9000
320 A$="     CARRYING AND":GOSUB 9000
322 A$="EXAMINE  = EXAMINE":GOSUB 9000
324 A$="     SOMETHING":GOSUB 9000
330 GOSUB 9200:GOSUB 9100
400 REM
```

```
402 REM ****** LOAD GAME ******
405 REM
410 A$="NOW LOAD PART TWO":GOSUB 9000
415 A$="  OF 'HALLOWEEN'.":GOSUB 9000
420 A$="     GOOD-LUCK!":GOSUB 9000
425 A$="  YOU WILL NEED IT.":GOSUB 9000
430 END
9000 REM
9002 REM ****** PRINT A$ ******
9005 REM
9010 FOR I=1 TO LEN(A$)
9020 B$=MID$(A$,I,1)
9025 PRINTB$;
9026 IF ASC(B$)<48 OR ASC(B$)>95 THEN 9030
9027 POKE 36876,INT(RND(1)*10)+128
9028 FOR R=1 TO 10:NEXT R
9029 POKE 36876,0
9030 NEXT I
9040 FORR=1 TO 30:NEXT R
9050 PRINT:RETURN
9100 REM
9102 REM ****** TITLE BLOCK ******
9105 REM
9110 A$="                    ":GOSUB 9000
```

```
9115 A$="■■ ■■  ALAN BLACKHAM'S  ■■ ■■":GOSUB 9000
9120 A$="■■ ■■ H A L L O W E E N. ■■ ■■":GOSUB 9000
9125 A$="■■ ■■                   ■■ ■■":GOSUB 9000
9130 A$="■■ ■■                   ■■ ■■":GOSUB 9000
9135 A$="■■ ■■                   ■■ ■■":GOSUB 9000
9140 A$="■■■■                     ■■":GOSUB 9000
9190 RETURN
9200 REM
9202 REM ****** PRESS ANY KEY ******
9205 REM
9210 A$="■■    PRESS ANY KEY      ■■":GOSUB 9000
9220 POKE 198,0
9230 GET A$:IF A$=""THEN 9230
9240 POKE 36876,220
9250 FOR R=1 TO 100:NEXT R
9260 POKE 36876,0
9270 RETURN
50000 REM
50002 REM ****** DEFINE CHARACTERS ******
50005 REM
50006 POKE 36878,15
50007 A$="■■■■■■■■----------------------":GOSUB 9000
50010 A$="■■P L E A S E  W A I T !":GOSUB 9000
50015 A$="■■----------------------":GOSUB 9000
50020 POKE 52,28:POKE 56,28
50025 FOR I=7168 TO 7679:POKEI,PEEK(I+25600):NEXT I
50030 X=7167
50035 X=X+1
50040 READ A:IF A=-1 THEN 50050
50045 POKE X,A:GOTO 50035
50050 PRINT"■":RETURN
60000 REM
60002 REM ****** DATA FOR CHARACTERS ******
60005 REM
60010 DATA 65,65,65,65,65,65,65,65
60015 DATA 65,65,127,127,65,65,65,65
60020 DATA 62,127,65,65,65,65,65,65
60025 DATA 64,64,64,64,64,64,64,64
60030 DATA 64,64,64,64,64,64,127,127
60035 DATA 65,65,65,65,65,65,127,62
60040 DATA 65,65,65,93,93,85,85,85
60045 DATA 85,85,85,85,85,85,85,85
60050 DATA 85,85,85,85,85,85,119,119
60055 DATA 127,127,64,64,64,64,64,64
60060 DATA 64,64,124,124,64,64,64,64
60065 DATA 64,64,64,64,64,64,127,127
60070 DATA 65,97,81,73,73,73,73,73
60075 DATA 73,73,73,73,73,73,73,73
60080 DATA 73,73,73,73,69,69,67,65
60085 DATA 0,255,255,255,255,255,255,0
60087 DATA 255,255,255,255,255,255,255,255
60090 REM ****** END OF DATA ******
60095 DATA -1,-1
```

Part 2

Part two is the first part of the adventure. You have several commands to enter. They are:

Examine
Look
Go
N,E,S and W
Shoot
Get
Drop

In the game you are faced with a screen like:

HALLOWEEN

You are in a
Dark Room

VISIBLE EXITS: N E

You can see
Wolf
Mat

What now
?

This means you are in a dark room and the ways out are North and East. In the room there is a Wolf and a Mat.

So now you can enter Look and that will tell you what you are carrying, if you want to go North you enter N.

If you want to put something down you enter 'Drop' and then what you want to drop. If you want to pick up the mat you would enter 'GET MAT'. If you wanted to examine the Mat you enter 'Examine Mat' and the computer will say something like:

"The mat is dirty".

All you have to do is to work out how to find the stairs and get on to part three of Halloween.

You can play part two without part three so you can try and get to the stairs and then get next weeks magazine and type in part three.

Hints on conversion

This program should be very easy to convert to any micro because it uses no commands that only the VIC has. It's all PRINT and IF...THEN statements.

How it works Part 2

100-245 print information
300-400 check for examine
400-500 check for N,E,S or W
500-600 check for Look
600-700 check for Get
700-800 check for Drop
800-900 check for other commands
9000-9060 print well done etc
9100-9150 print bad luck etc
40000-40025 initialise
40100-50060 set up variables etc

Variables

I,J and **R** FOR loops
P$,N,E,S,W. data
NM$ your input
e$ temp store
F(1 to 10) flags
IS(1 to 10) items in rooms
I(1 to 10) where items are
C(1 to 20) what items you are carrying
no number of items
RO room you are in

Warning: Get a friend to type in lines 800 to 900 because if you do it, you'll find out how to get to the stairs and then there is no fun in the game...

Special Commands

POKE 36879,X change screen colours
POKE 36878,1 to 15 volume
POKE 36874 to **36877** sound channels
POKE 1984,o clear keyboard buffer
SYS 64802 reset computer

```
1 REM   ********************
2 REM   * ALAN BLACKHAM'S *
3 REM   *     HALLOWEEN    *
4 REM   *      PART 2      *
5 REM   *    (24/08/83)    *
6 REM   ********************
7 REM
8 PRINT"■"
10 POKE 36879,8:POKE 36878,15
17 GOSUB 40000
100 REM ****** INPUT COMMAND ******
107 PRINT"■■ H A L L O W E E N "
108 PRINT"■----------------------"
110 PRINT"■    YOU ARE IN A "
111 PRINT"    ■■";
112 RESTORE
113 FOR I=1 TO RO
115 READ P$,N,E,S,W
117 NEXT I
120 PRINT P$
122 PRINT"■----------------------";
125 PRINT"■■  EXITS ARE  ■■";
130 IF N<>0 THEN PRINT"N ";
132 IF E<>0 THEN PRINT"E ";
134 IF S<>0 THEN PRINT"S ";
136 IF W<>0 THEN PRINT"W ";
138 PRINT
140 PRINT"■----------------------";
150 PRINT"■■YOU CAN SEE ■■"
155 REM ****** FIND WHATS IN ROOM ******
160 FOR I=1 TO NO
165 IF I(I)<>RO THEN 180
166 IF C(I)=1 THEN 180
167 FOR J=1 TO LEN(I$(I))
168 IF MID$(I$(I),J,1)<>"/"THEN NEXT J
170 PRINT MID$(I$(I),2,J-2)
180 NEXT I
185 PRINT"■----------------------";
200 REM ****** INPUT WHAT TO DO ******
210 PRINT"■■   WHAT NOW ?" POKE 198,0
220 NM$="":INPUT"■■";NM$
230 POKE 36876,220
235 FOR R=1 TO 100:NEXT R
240 POKE 36876,0
245 IF NM$=""THEN GOSUB 50000:GOTO 100
300 REM ****** CHECK FOR EXAMINE ******
310 IF LEFT$(NM$,7)<>"EXAMINE" THEN 400
315 E$=MID$(NM$,9,9)
330 FOR I=1 TO NO
332 IF I(I)<>RO THEN 345
334 FOR R=1 TO 100
336 IF MID$(I$(I),R,1)<>"/"THEN NEXT R
338 A$=MID$(I$(I),2,R-2)
340 IF A$=E$ THEN 350
345 NEXT I
347 PRINT"■■I DON'T SEE IT!":GOSUB 50015:GOTO 100
350 REM ****** EXAMINE ITEM I ******
355 PRINT"■----------------------";
360 PRINT"■■THE "E$" IS ";
365 FOR G=1 TO 100
367 IF MID$(I$(I),G,1)<>"/" THEN NEXT G
370 PRINT MID$(I$(I),G+1,15)
380 PRINT"■■■    PRESS ANY KEY     ■■";
382 POKE 198,0
390 GET A$:IFA$="" THEN 390
395 GOTO 100
400 REM ****** CHECK FOR N E S OR W ******
410 IF NM$<>"N" THEN 420
415 IF N=0 THEN 490
417 RO=N:GOTO 100
420 IF NM$<>"E" THEN 430
425 IF E=0 THEN 490
427 RO=E:GOTO 100
430 IF NM$<>"S" THEN 440
435 IF S=0 THEN 490
437 RO=S:GOTO 100
440 IF NM$<>"W" THEN 500
445 IF W=0 THEN 490
447 RO=W:GOTO 100
450 GOSUB 50000:GOTO 100
490 PRINT"■YOU CAN'T GO THAT WAY!";
495 GOSUB 50015:GOTO 100
500 REM ****** CHECK FOR LOOK ******
505 IF NM$<>"LOOK" THEN 600
507 PRINT"■----------------------"
510 PRINT"■  YOU ARE CARRYING:"
520 FOR I=1 TO 20
525 IF C(I)=0 THEN 550
530 FOR J=1 TO 100
532 IF MID$(I$(I),J,1)<>"/"THEN NEXT J
540 PRINT"■   A "MID$(I$(I),2,J-2)
550 NEXT I
560 GOTO 380
600 REM ****** CHECK FOR GET ******
605 IF MID$(NM$,1,3)<>"GET" THEN 700
610 E$=MID$(NM$,5,20)
620 FOR I=1 TO NO
625 IF I(I)<>RO THEN 645
630 FOR J=1 TO 100
632 IF MID$(I$(I),J,1)<>"/"THEN NEXT J
635 O$=MID$(I$(I),2,J-2)
640 IF O$<>E$ THEN 645
642 IF MID$(I$(I),1,1)="0" THEN PRINT"■IT'S TO HEAVY!":GOSUB 50015:GOTO 100
643 C(I)=1:CN=CN+1 IF CN<4 THEN 800
644 CN=3:C(I)=0:PRINT"■■YOU CAN'T CARRY ANY   MORE !":GOSUB 50015:GOTO 100
645 NEXT I
647 PRINT"■■I CAN'T SEE IT!":GOSUB 50015:GOTO 100
700 REM ****** CHECK FOR DROP ******
705 IF MID$(NM$,1,4)<>"DROP" THEN 800
710 E$=MID$(NM$,6,15)
715 FOR I=1 TO NO
720 FOR J=1 TO 100
722 IF MID$(I$(I),J,1)<>"/"THEN NEXT J
725 O$=MID$(I$(I),2,J-2)
730 IF O$=E$ THEN 750
735 NEXT I
740 GOSUB 50000:GOTO 100
```

```
750 IF C(I)=0 THEN GOTO 740
755 C(I)=0:I(I)=RO
756 IF NM$="DROP GUN" THEN F(7)=0
757 IF NM$="DROP KEY" THEN F(9)=0
760 CN=CN-1
790 GOTO 100
800 REM ****** CHECK FOR OTHERS ******
805 IF NM$<>"GET MAT" THEN 820
807 IF F(2)=1 THEN 100
810 PRINT"■ A GUN FALLS FROM IT!"
812 NO=NO+1:F(2)=1
817 I$(NO)="1GUN/LOADED":I(NO)=RO
818 GOTO 380
820 IF NM$<>"OPEN SAFE" THEN 830
822 IF RO<>3 THEN GOSUB 50000:GOTO 100
823 IF F(1)=0 THEN PRINT"■I CAN'T YET!":GOSUB 50015:GOTO 100
824 IF F(8)=1 THEN 100
825 PRINT"■THERE IS A KEY IN IT!"
826 NO=NO+1:F(8)=1
827 I(NO)=RO:I$(NO)="1KEY/A DOOR KEY":GOTO 818
830 IF NM$<>"OPEN DRAWER" THEN 840
832 IF RO<>4 THEN GOSUB 50000:GOTO 100
835 PRINT"■SOME VAMPIRE BATS FLY ■OUT OF IT AND KILL YOU"
837 PRINT"■■■■    BAD LUCK!":GOTO 9100
838 GOTO 838
840 IF NM$<>"OPEN CUPBOARD" THEN 850
842 IF RO<>4 THEN GOSUB 50000:GOTO 100
845 PRINT"■■THERE ARE SOME NUMBERSON THE INSIDE!"
847 F(1)=1:GOTO 818
850 IF NM$<>"SHOOT WITCH" THEN 860
852 IF RO<>9 THEN GOSUB 50000:GOTO 100
853 IF F(2)=0 OR F(7)=0 THEN PRINT"■I HAVN'T GOT A GUN!":GOSUB 50015:GOTO 100
854 I$(15)="1WITCH/DEAD":F(3)=1
856 GOTO 100
860 IF NM$<>"OPEN DOOR" THEN 870
862 IF RO<>9 THEN GOSUB 50000:GOTO 100
863 IF F(8)=0 OR F(9)=0 OR F(3)=0 THEN PRINT"■I CAN'T YET !":GOSUB 50015:GOTO 1
00
864 I$(16)="0DOOR/OPEN":F(4)=1
865 GOTO 100
870 IF NM$<>"GO DOOR" THEN 880
872 IF RO<>9 THEN GOSUB 50000:GOTO 100
873 IF F(4)=0 THEN PRINT"■I CAN'T YET!":GOSUB 50015:GOTO 100
875 GOTO 9000
880 IF NM$="STOP" THEN 9100
890 IF NM$="GET GUN" THEN F(7)=1:GOTO 100
900 IF NM$="GET KEY" THEN F(9)=1:GOTO 100
990 IF MID$(NM$,1,3)="GET" THEN 100
995 GOSUB 50000:GOTO 100
9000 REM ****** LOAD NEXT PART ******
9010 PRINT"■■■  WELL DONE !"
9020 PRINT"■■ YOU HAVE FOUND THE    STAIRS TO THE NEXT    FLOOR ."
9030 PRINT"■■■■■■■■■■■■■■■■■■■■■■■■"
9032 FOR I=128 TO 250
9034 POKE 36876,I:NEXT
9037 POKE 36876,0
9040 PRINT"■■NOW LOAD PART THREE"
```

```
9060 END
9100 REM ****** LOST ******
9102 FOR I=220 TO 150 STEP -1
9103 POKE 36877,I:NEXT I
9104 POKE 36877,0
9110 PRINT"■■  DO YOU WANT ANOTHER   GAME (Y OR N)?"
9120 POKE 198,0
9130 GET A$:IF A$<>"N"AND A$<>"Y"THEN 9130
9140 IF A$="Y" THEN RUN
9150 SYS 64802
40000 REM ****** INITIALISE ******
40010 DIM F(10),I$(20),I(20),C(20)
40025 NO=16:C(2)=1:RO=1:CN=1
40100 REM ****** DATA FOR GAME ******
40110 DATA  SMALL ROOM,0,0,0,2
40115 DATA  CORRIDOR,0,1,0,3.
```

```
40120 DATA  DARK ROOM,7,2,0,0
40125 DATA  LARGE ROOM,8,0,0,5
40130 DATA  BED ROOM,6,4,0,0
40135 DATA  DUSTY ROOM,0,4,5,7
40140 DATA  DIRTY ROOM,0,6,3,0
40145 DATA  PASSAGE,0,0,4,9
40150 DATA  CORRIDOR,0,8,0,0
40190 DATA END
40200 READA$:IF A$<>"END" THEN 40200
40205 FOR I=1 TO 16
40210 READ I$(I),I(I)
40220 NEXT I
40225 RETURN
40230 DATA 1TIN CAN/EMPTY,1,1NAIL/RUSTY,1
40235 DATA 0PAINTING/ON THE WALL,2,0LIGHT/SWITCHED ON,2
40240 DATA 0SAFE/LOCKED,3
40245 DATA 0DRAWER/CLOSED,4,0CUPBOARD/CLOSED,4
40250 DATA 1CORPSE/MOULDY,5,1RADIOGRAM/BROKE,5
40255 DATA 1DEAD RAT/STIFF,6,1PEN/BROKEN,6
40260 DATA 0WOOD/SCREWED DOWN,7,1MAT/WOOLEN,7
40265 DATA 1CAT/DEAD,8
40270 DATA 0WITCH/ANGRY,9,0DOOR/LOCKED,9
50000 REM ****** DON'T UNDERSTAND ******
50010 PRINT"■■I DONT KNOW HOW TO      ";NM$
50015 FOR J=1 TO 3
50020 FOR I=200 TO 220
50030 POKE 36877,I:POKE 36874,I+10
50040 FOR R=1 TO 5:NEXT R,I,J
50050 POKE 36877,0:POKE 36874,0
50060 RETURN
```

New games: how do they play?

Adventure and arcade games for the Spectrum are given the once-over by our panel of reviewers

Devils of the Deep 48K £6.50

Richard Shepherd Software, Elm House, 23-25 Elmshott Lane, Cippenham, Slough, Berks

In Devils of the Deep you are a diver searching Atlantis for a lost treasure while trying to avoid the giant electric eels.

You have limited reserves of strength and oxygen, but may pick up items from the sea bed to replenish them or to attack the eels. Otherwise you can escape by hiding behind the ruins or skipping into the next sector of the seabed.

The display of this adventure game shows a three dimensional representation of Atlantis, with ruined buildings and assorted debris, and the diver is moved by the cursor keys, leaving footprints in the sand.

Very useful instructions are given on the cassette inlay, and the program loaded easily. The graphics are bright and cheery, but all the sectors look much the same. The diver moves slowly, and there seem to be few monsters, so the game soon palls.

The game can be saved and restarted later, but running out of strength means a long wait while a new game is generated.

H.W.C.

instructions	80%
playability	60%
graphics	75%
value for money	60%

★ ★ ★

Hard Cheese £5.95

dk'tronics, Shire Hill Industrial Estate, Saffron Walden, Essex

This game reminds me a little of the arcader Mr Do, except that you play a bulldozer instead of a pixie. The fact that I have played Mr Do in the arcades helped enormously since absolutely no playing instructions were supplied with the game.

The idea is to create tunnels with your bulldozer and hide from the ferocious foremen running about in these tunnels.

When a foreman comes too close for comfort you can fire a block of concrete at him — definitely not good for labour relations, though. Placed around the screen are concrete slabs and these can be consumed for points, but the really big score comes when you tunnel a hole under an apple causing the apple to fall on a foreman.

Once all the foremen have been cleared a new screen is created along with more maniac management to pursue you.

Once I understood it, I thoroughly enjoyed this game. The graphics are mediocre and movement is a little jerky, but this is more than made up by excellent use of sound with no less than three catchy tunes thrown in for good measure. Squashing a foreman with an apple results in an explosion of sound — all on my little Spectrum.

T.B.

instructions	10%
playability	75%
graphics	55%
value for money	75%

★ ★ ★ ★

Greedy Gulch 48K £4.95

Phipps Associates, 99 East Street, Epsom, Surrey KT17 1EA

This is an adventure game set in a deserted Wild West mining town and the aim is to find a gold nugget and bring it back to the sheriff's office.

Each obstacle overcome adds to your score. Full instructions are displayed at the beginning of the game. The display shows a series of scenes or sections of a map and the instructions, reports and clues as text above or below it.

The player must pick up a number of objects — maps, guns, lamps and so on — which he will need later, and find his way through the hazards to his target. There are many branch routines, some with useful items, some just dead ends — literally, which means he can die of thirst in the desert.

The usual GO EAST, PICK UP type of instructions are used, and there are HINT and HELP options, though they are often quite unhelpful. The program allows the game to be saved and restarted later if required.

This is a most attractively presented game with excellent graphics. It loaded easily and there did not appear to be any bugs, and the instructions are comprehensive and easy to follow.

H.W.C.

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

★ ★ ★ ★ ★

Maziacs 48K £6.95

dk'tronics, Shire Hill Industrial Estate, Saffron Walden, Essex

This game must be seen to be believed. One of the best uses of Spectrum in all aspects that I have seen.

with more variations than most — you only see about one fiftieth of the maze on the screen at a time. The rest moves in as you run along its paths. You can view about a twelfth of the maze by pressing V.

Having loaded the tape (machine code) you press any key for instructions. These are extremely good and you move quickly onto the game. The object is to run through the maze to pick up some treasure, this being about 200 moves from the start.

On the way you meet the Maziacs who you fight till death.

Around the maze you come to food to keep you going and also prisoners who actually show the way by marking your path in **yellow for a number of moves. You may pick up replacement swords but cannot carry both a sword and the treasure.**

There are different levels of difficulty, which you don't have to use immediately because a completely new maze is created for each game you play. So you will not tire of playing again and again.

C.McL.

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

★ ★ ★ ★ ★

3D Luna Crabs £6.95

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

Yet another bunch of aliens for you to blast out of existence in this very well written arcade game.

This time, you are stuck on an alien planet in a crawler that has lost part of its power. All you can do is to spin round and fire your cannon at the little crabs who have the disgusting habit of galloping up and spitting acid balls at you.

Each crab you kill with your photon cannon counts for 10 points and there is a bonus after each 15 you get.

The graphics really are excellent and the whole program responds extremely quickly to the keyboard. The crabs are rather Earthlike and don't look at all menacing but they still kill.

I did feel, though, that there could have been a bit more in the game to generate more interest. Perhaps a giant turtle which requires a lot more direct hits to kill could be added.

The only other problem that I found was that the game starts running without a pause on loading, so you can lose a couple of lives while you are sorting out your tape recorder.

It is a great pity that, with so many programs, when you have been killed off the computer asks you to press a key for another go, but not to end the game.

N.B.

instructions	90%
playability	75%
graphics	100%
value for money	85%

★ ★ ★ ★ ★

MR. CHIP SOFTWARE

VIC 20 GAMES AND UTILITIES

JACKPOT
This is it, the ultimate Fruit Machine for the VIC with nudge, hold and respin 100% machine code. "Overall Jackpot is a beautifully written simulation giving superb graphics, animation and use of colour. In fact, this program makes Commodore's Fruit Machine cartridge look unbelievably cheap & nasty." Home Computing Weekly No. 20 19/7/83 ..... **£5.50**

KWAZY KWAKS
Accuracy and speed are required for this Shooting Gallery, superb use of colour & graphics in this new and challenging game from the author of **Jackpot.** 100% machine code, joystick or keyboard control **£5.50**

PACMANIA
Choose your own game from the following options — difficulty 1-2, speed 1-3, size of maze 1-3, visible or invisible maze, still or moving power pills, define your own key controls, any combination, if this is your type of game, then this is the one for you, for the 3K expanded VIC only, (available Now) **£5.50**

SNAKE BYTE
Guide your ever hungry snake round the screen, eating the flies and wasps, to stay alive you must avoid the deadly mushrooms, quick reactions are required for this biting game, keyboard control, for the unexpanded VIC, (available NOW) .. **£5.50**

BUGSY (Joystick Only)
This is a Minefield with a difference as you step on the stones whilst collecting purple boxes which give you both time and points, they disappear from beneath your feet. DO NOT DESPAIR! "BUGSY" will randomly replace the stones but avoid bumping into him or its sudden death! An original compulsive and challenging game **£5.50**

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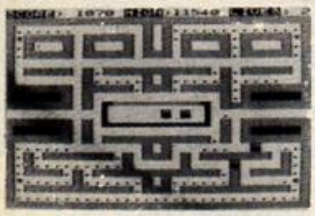

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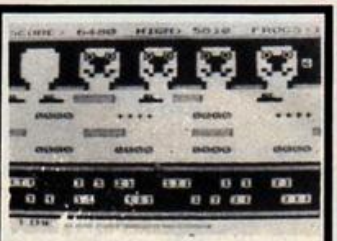

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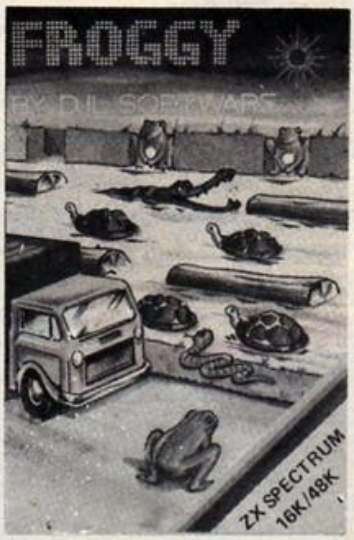


How to corner the software market

Lyversoft, software originators and wholesalers, are selling software in the strangest places. Managing director Barry O'Neill told Dave Carlos all about it

Just think...no more long bus rides, no more waiting weeks for the post to arrive or for your favourite software to become available in your local shop. All that could become a reality if a new idea being promoted by Lyversoft works out.

This brainwave is Computer Corners, which provides a service for shops who have no computer expertise, but who want to sell software. Lyversoft will set up such 'corners' and stock them with top-selling games cassettes for a wide variety of micros.

The idea came from Barry O'Neill, managing director of Lyversoft, who tried it out in four local shops to start with.

"It went so well that since February we have had to become software wholesalers. We have corners in shops of all varieties; wine, video and record, greengrocers, garages, and newsagents.

"Retailers were frightened and bewildered by the vast number of titles and types of software available, so we help by stocking their shelves with proven best sellers, either 50, 100 or 150 titles. We can also supply books and magazines if required."

Computer Corners have now caught on to such an extent that five full-time staff now take orders from shops at least once a week and then supply from vans or by mail. The operation grew out of the other Lyversoft activities of software publishing and retailing.

Equipment Centre, is right in the heart of Liverpool, at 66 Lime Street. It sells only software, magazines and books, and the company claims to stock over 600 software titles already, with a planned 1,000 or more by Christmas. What is more they have programs for nearly every home computer.

Jim Pendlebury, who joined the company from Rumbelows in March, said that they "intend to be the biggest software shop in the North West of England or even the entire UK". Their range covers all kinds of programs; games, adventures, business packages and the educational titles which Jim believes will be the big growth area of the future.

It was from the shop that the software publishing side of the business sprang. "In Autumn 1982, some of our customers started to bring in their programs which we just sold in plain packaging on a purely local basis. They sold very well, and proved popular enough for us to collect together a package for full release in April this year."

The original release was of six VIC-20 games, some of which had two programs on the cassette.

"Apple Bug and Crazy Climber seemed to catch the imagination and did much better than even we expected", Barry recalls. These programs were all written by 13 to 18 year olds, some of whom are now employed as consultants advising on new software that comes in.

Another of the company's new ideas is to provide a room in the shop for their programmers, all whom are freelance, to meet, swop ideas and hold Think Tanks. "We believe that the discussions they have can only help the program quality and assist in the conversion of a program from one machine to another, something we expect to do more of soon", said Barry.

Barry O'Neill (right) and Jim Pendlebury of Lyversoft — helping the retailers

Now, with a range of programs already established, Lyversoft is preparing for the release of another group which should be ready by November. The list is provisional as yet but covers many more micros and types of program.

These are in the hands of Paul Foster who recently rejoined the company after taking an extended computer course and who originally joined them after management experience with Habitat.

There could be five releases for the Spectrum: Liberator, a pilot's eye view shooting game, Lunar Rescue, converted from the VIC, Golf, a double games pack and one game that is too secret even to mention.

There should be a database from the BBC, which Paul is currently working on, two releases for the Dragon 32, Picture Puzzler, which has a moving block theme, and Humanoid Invader which Barry described as "an inverted space invader game".

They are not abandoning the VIC, however and have several titles for that micro too. One, called Space Eggs is a shooting game, Digger will be a two-level arcade type game, Hopping Mad (guess what?) and a space adventure game.

A number of ZX81 games are also under consideration.

All these new releases, together with the existing operations, need a great deal of money. It is here that the parent company comes into its own.

As Barry said "We started this side of the business back in September 1981 when very few companies were involved. The company's background in computers and office equipment meant we had the technical background needed. Now business has grown to such an extent that I have been seconded from the board to oversee Lyversoft's development.

"Having the shop means we know what is selling and how far out some of the published charts are in this respect. We look forward to the price of machinery dropping even more, as this can only help everyone — Lyversoft included."

Practical programs: how they perform

A selection of serious software is put through its paces by our team of reviewers

BC BASIC Commodore 64 £19.95

BC Computers, 31A Grosvenor Avenue, Long Eaton, Nottingham.

BC BASIC is a cassette-based BASIC extension with extra commands for hi-res, sound, sprites and various other elements.

To use BC BASIC you must first load it into memory — which takes about five minutes. You are now ready to go.

The hi-res/screen commands are not very advanced; they do nothing more complicated than draw lines and plot points. Compared with Simon's BASIC this is not a lot. Simon's can fill complicated areas, draw circles, plot gradients, etc.

The sound commands make your programs more readable. They do away with lists of POKEs and allow a wide range of control over the SID chip. Unlike Simon's BASIC they do not allow music composing.

Sprite commands allow you to define sprites and characters. There is a long list of sprite setting commands. I found these quite pointless — they do nothing a POKE or two to the VIC chip cannot do.

Finally, the structured programming commands include features such as IF..THEN ..ELSE, REPEAT ..UNTIL. There are also commands to read the joysticks, paddles, user-port and keyboard.

To sum up, I found well over half have a single PEEK/POKE equivalent. This more or less rendered most pointless to me. Simon's BASIC offers an extensive range of extremely useful and powerful commands.

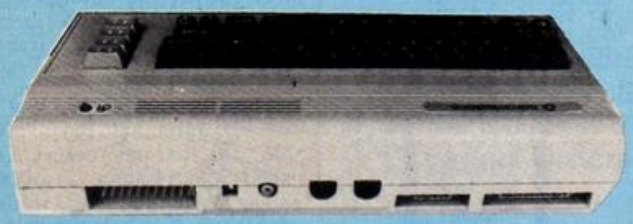
Graphics and sound sections of the manual explain some related instructions, for the rest you must hunt through the glossary. It would have been better organised into subject sections, as Commodore has done with Simon's BASIC.

At £20 it is a few pounds overpriced. It is, however, a fairly cheap way of getting hi-res and sound commands. The package is well below the standard of Simon's BASIC, but if your budget only runs to about £20 then this is available and it does seem to work well. You only get what you pay for.

K.I.

instructions	50%
ease of use	70%
display	60%
value for money	50%

★ ★ ★



GP COPY BBC B £3.95

Logic Systems, Cambridge Rd, Gornal, Dudley DY3 2UR

This program is for those BBC owners with a Seikosha GP80,100 or 250 dot matrix printer. It allows high resolution screens to be copied to the printer at the touch of a button.

The routine loads into a reserved section of memory and is accessed by a three-line addition which you simply tack on to the end of your graphics program.

It will produce a screen copy in modes 0,1,2,4 and 5, and has the option of altering which logical colour on the screen will be represented by black on the printer.

If you don't want to use up half a printer ribbon in one go it is better to set the printout background colour to white, so that all black sections of the screen appear white on the copy. This does not affect the rest of the colours, which appear in shades of grey.

The routine took approximately six minutes to produce a mode 0 dump with most of the screen used.

Instructions were clear, but the manufacturers do recommend that users read their printer manuals carefully before using the copier. Even so, the routine was very easy to use, only requiring the press of any key to produce the printout.

D.A.

instructions	70%
ease of use	80%
display	n/a
value for money	96%

★ ★ ★ ★

First Aid 48K Spectrum £4.99

Network Computer Systems

This BASIC program is a comprehensive guide to first aid, presented in a lively and interesting manner. It's easy to use and rewarding.

On loading, you are presented with a menu with options for: studying the whole course, revising any topic, or testing yourself on any topic. The list of topics comprises: scope of first aid, body mechanism, asphyxia, bleeding, broken bones, burns and scalds, poisoning, shock, and emergency procedures. In short, all you need to know.

The program really gets to the heart of the matter (sorry!) with concise and lucid text displays. These are supported by simple but effective diagrams. For example, the blood circulation is shown in full colour with sound effects for the pulse. You study at your own pace, the next page being accessed by pressing any key.

When you answer questions, the program compares your input with key words held in a string variable. This means it will accept the right words in a line full of gibberish! Also, it doesn't tell you which of the words in your answer were the right ones. Despite these drawbacks, it's satisfying when you score well.

C.C.

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

★ ★ ★ ★

Beebcalc BBC B £19.95

Gemini Marketing, 18 Littleham Rd, Exmouth, Devon

Beebcalc allows the user to design and set up spreadsheets. It is well documented, easy to load and the screen display excellent, enabling a non-experienced person to use it with ease.

The spreadsheets can have up to 50 rows, 26 columns and each column can be up to 32 characters wide. Each cell accepts text or numerical data. A formula can be assigned to individual cells and the formula can relate to the numerical contents of other cells combined with a wide range of mathematical functions, and will accept any valid BBC expression.

Cells are accessed by direct command or by cursor keys, the screen scrolling as required. The information regarding any cell is easily manipulated and the program will automatically recalculate after each entry or it can be set to calculate the whole sheet after all changes have been made.

Screen display is in colour and information concerning the current cell, such as contents, related formula and prompts are displayed at the bottom of the screen. Other information regarding modes and cell number are shown above the spreadsheet.

J.H.D.

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

★ ★ ★ ★ ★

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You have my absolute Guarantee of the complete authenticity of every claim, cheque, document, letter, etc, contained herein.

I do have losing weeks, but ON AVERAGE my winnings show over SIX DIVIDENDS **EVERY WEEK** for the past 25 years.

I know that you are now utterly flabbergasted, it always happens to everyone with whom I come into contact. Please just sit back and **imagine** for a moment my **FIRST DIVIDEND** wins alone — they now number 765 (seven hundred and sixty-five) and will probably be even more by the time this advertisement appears in print.

I AM NUMBER ONE IN THE WORLD AND NO ONE DISPUTES IT.

For as long as I continue to enter the Football Pools my wins will continue. I have already said, they apply, with equal success to both English and Australian Football Seasons.

I intend to release a STRICTLY LIMITED NUMBER of copies of my cassette, (either for Sinclair ZX81 or Sinclair Spectrum) — DO NOT DELAY AND FIND YOU ARE TOO LATE, in which case I would have to refund your money.

I am so confident of **YOUR** success that if do **not** win at least THREE FIRST TREBLE CHANCE DIVIDENDS in the first 20 weeks of entering, I will completely cancel the balance of the purchase price and you do not have to pay me another penny, at any time, no matter how vast your winnings.

I only wish that space would allow me to give you photographs of my winnings slips, cancelled cheques, etc, but it is of course impossible — they now number 8,201 dividends. I have however given JUST A FEW EXTRACTS from ORIGINAL LETTERS I hold from my small Clientele.

I am the Inventor and Sole Proprietor of my method, Registered as EUREKA — ('I have found it'). I am known as The Professor in Pools Circles — I am of the Highest Rank in Forecasting — this is beyond dispute. I am marketing a limited number of Computer Cassettes, under my Registered Company — FOOTBALL ENTERPRISES.

My initial charge for a copy was £75, but for this SPECIAL REDUCED PRICE OFFER I will send you a copy, (for ZX81 or Spectrum) for £20, (twenty pounds) ONLY, plus your Promise to pay me the balance of £55 — **ONLY** IF YOU WIN AT LEAST THREE FIRST TREBLE CHANCE DIVIDENDS IN YOUR FIRST 20 WEEKS OF ENTERING — otherwise you owe me NOTHING FURTHER.

This is surely proof absolute of my supreme and utter confidence in my own abilities and in the capabilities of my discovery. I could easily CHARGE £2,000 per cassette on the evidence I possess, but that would not be fair to everyone, which is what I want to do.

My method is WORLD COPYWRIGHT, any infringement and immediate proceedings will be taken, without prior warning. It is truly ingenious and has stood the test of time.

My cassette is simplicity itself to operate and you'll be given FULL DETAILS for weekly calculating. Your entry need not involve you in any large weekly stakes, you can enter for as little as 25p, if you wish.

I charge NO COMMISSION on any of your wins — no matter how BIG they may be.

I realised a long time ago, that it was no good sitting down and **dreaming** about winning the pools, so I burnt the candle at both ends, working late into the night, occasionally RIGHT THROUGH THE NIGHT, I **KNEW** there was a way, eventually it all paid off and has been doing so ever since.

I am unable to vary my offer to anyone, so please do not request it, as I shall very easily dispose of the cassettes I have prepared and am making available.

IMMEDIATELY I perfected my method I commenced winning right away, (first with just a little £163, the first week I used it), I HAVE NEVER LOOKED BACK SINCE, amongst all those dividends was one for over **EIGHT THOUSAND POUNDS** for just **one eighth of a penny stake.**

I will release a copy on cassette, to you, on receipt of the completed order form and your Signature thereon, confirming you will treat it in the STRICTEST CONFIDENCE between us and retain it for your **OWN USE ONLY.**

PLEASE NOTE:
If you happen to be the proud owner of a Computer, **other than** a Sinclair ZX81 or Sinclair Spectrum, you can still purchase a copy of my method, for the same price and program it YOURSELF on to YOUR OWN COMPUTER.

Don't take my word for it, read what people write about me and my method:—

I won on Zetters last weekend. It was not a big sum, but all the same it was a very nice surprise for me. J.C., Lancs.

I appreciate the straightforward method you adopt, which is such a contrast to the rubbish of misrepresentation which is so common in the Betting World, by unscupulous and self-opinionated charlatans. C.H., Devon

Winnings cheque received today, sincere thanks. D.N., Devon

I congratulate you on your achievement. R.R., Wales

I should like to thank you for a most exciting season and look forward to hearing from you again. J.C., Hants.

I would like to acknowledge cheque and say how much I appreciate your integrity. J.M., Scotland

Many thanks for your system, it is all you say and more. J.C., Lancs.

Your wonderful system won me £3,527. I intend to visit London soon and will be able to come and see you personally. (Overseas Client). P.M., Kampala.

Many thanks for trying so hard to please us all, your brother should be thanked also. One of our daughters, WHOSE HUSBAND YOU HELPED ENORMOUSLY, has just phoned, the four of them have just spent a lovely holiday in Spain. K.R.,Isle of Man.

I sent in my FIRST entry last week and won 2nd and 3rd dividends, as you will see from the enclosed certificate. One more and I would have collected over £400 for FIRST dividend. Once I've won a fair amount I shall be staking from winnings and at 2p per line, A FIRST DIVIDEND last week at this would have been over £3,000. C.A., Yorks.

I am very interested indeed and enclose £20 herewith. I agree to pay you the balance of £55 **ONLY** if I win at least THREE FIRST TREBLE CHANCE DIVIDENDS in my first 20 weeks of entering — otherwise I owe you NOTHING FURTHER at any time — no matter how much money I win. My Signature below is my Undertaking to retain complete and absolute confidence about the method.

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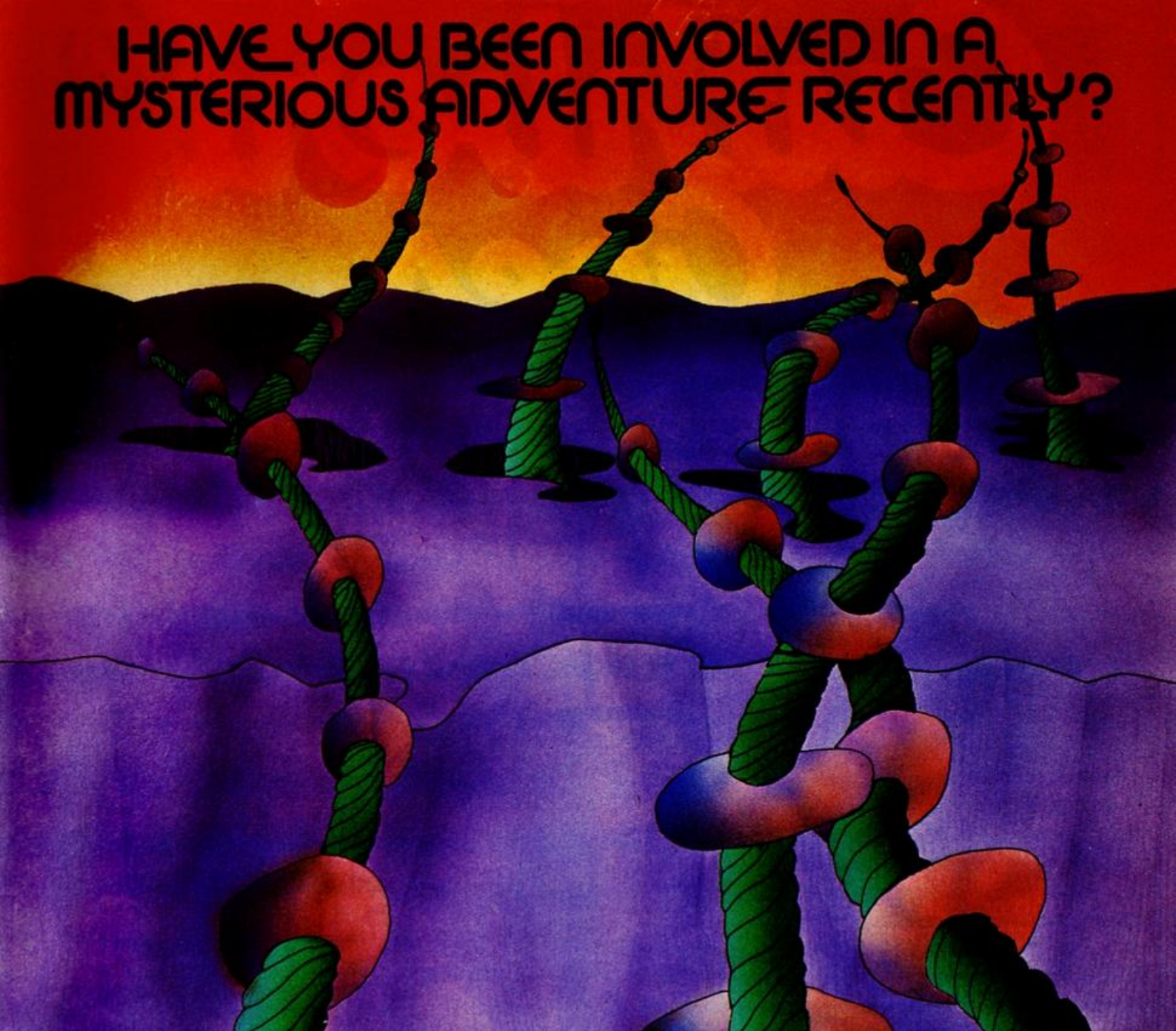

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