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# CONTENTS

**Graphics instructions** 5



Soft Focus

**Listings** 22

**Program Tutor** 23

**Listings** 26

**Got it licked** 30

**Pen friends** 31

**Sprogs** 33

**Beginners'** 45

**Spectrum competition** 49

**Soft spot** 50

**Listings** 53

**Editorial** 5

**Letters** 7

**News** 10

**Chart** 15

**Soft focus** 16

**ZX-81 competition** 21



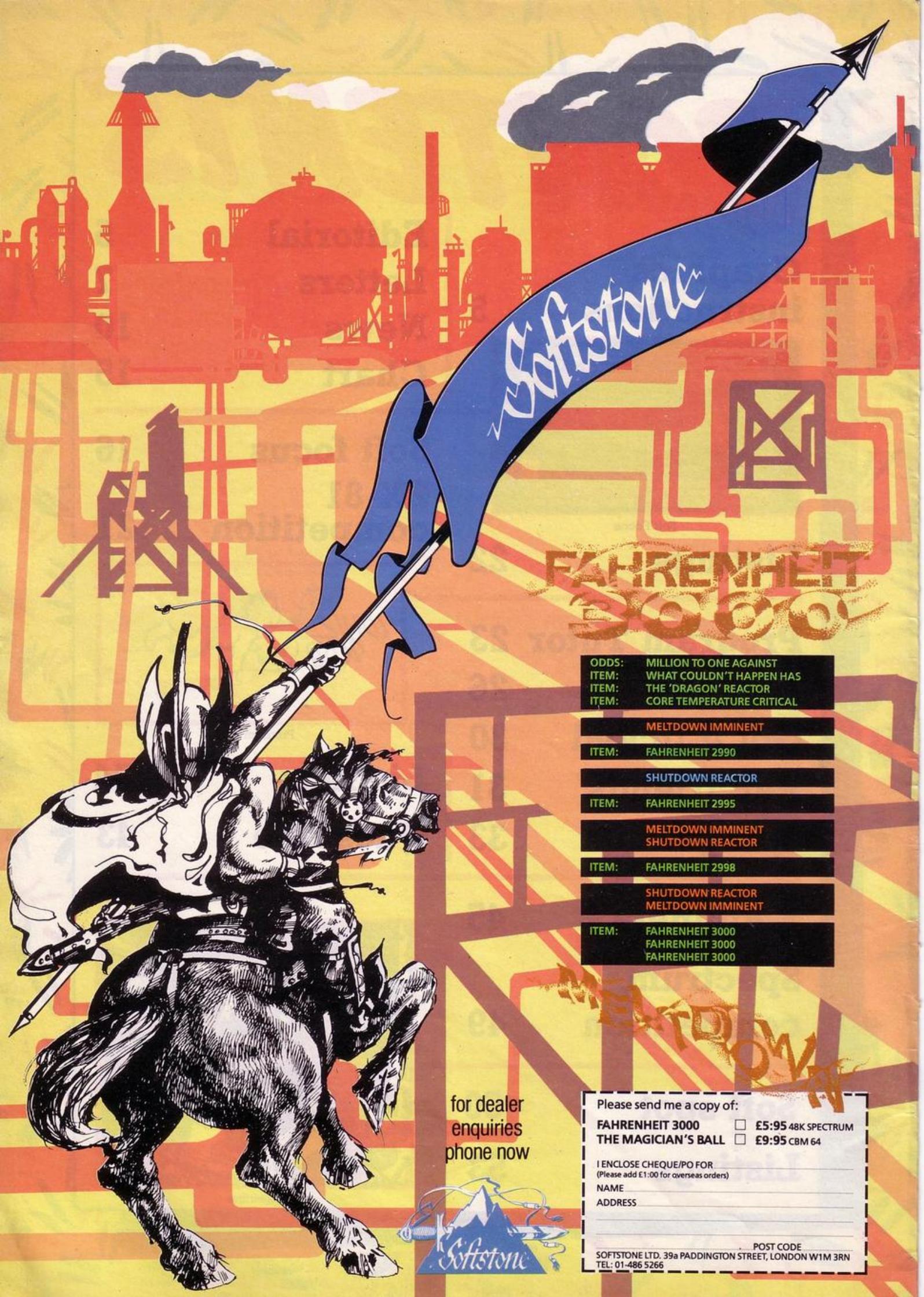
Program Tutor

**Listings** 34

**Questline** 43



Questline



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**A**LL THE listings which we publish in *Sinclair Programs* are written by readers. Everything from the simplest Basic listing to the most complicated machine code routine has been written, not by a professional, but by one of our readers.

If you have written a program which you would like us to consider for publication, there are several simple guidelines which you should follow. First, debug the program. Then run the program and do all the stupidest things which you can imagine. Try to run off the edge of the screen. Deliberately jump to your death in the most unlikely places. Type in responses which are totally ridiculous. If you find any problems, debug the game again.

Next, look at the length of the program. Constraints of space mean that we cannot publish all the long programs which are submitted to us. If your listing fills fewer than ten screens of text, then it is around the right length. If it is too long, check it again. Have you wasted space with repetition of subroutines, or needless use of BIN statements? Make your listing as short as possible, so that other people will find it quick to type in to their computer.

Finally, record your program on a cassette, label it clearly with your name and address, write a covering letter explaining what the program does, and post it to us, together with a stamped, addressed envelope.



**Editor**  
Rebecca Ferguson

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Telephone 01-251 6222

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EMAP,  
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London EC1R 3AU

Programs should be on cassette. We cannot undertake to return them unless a stamped, addressed envelope is included. We pay £25 for the copyright of listings published and £10 for the copyright of listings published in the Beginners' section.

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**Cover Illustration—Paul Carney**

Instructions for graphics characters are printed in lower-case letters in our listings. They are enclosed by brackets and separated by colons to distinguish them and the brackets and colons should not be entered. Do not attempt to underline the characters, the underlining is used specifically to point out a graphic character.

Inverse characters are represented by the letter "i" and graphics characters by "g" on the ZX-81. Thus an inverse W would be represented by "iW", a graphics W by "gW", and an inverse graphics W by "igW".

Spaces are represented by "sp" and inverse spaces by "isp". Whenever any character is to be used more than once, the number of times it is to be used is shown before it, together with a multiplication sign. Thus "6★isp" means six inverse spaces and "(g4:4★i4:g3)" would be entered as a graphic four, followed by an inverse four repeated four times, followed by a graphics three.

Where whole words are to be written in inverse letters they appear in the listings as lower-case letters. Letters to be entered in graphics mode on the Spectrum and Spectrum+ are underlined.

Inverse characters may be entered on the ZX-81 by changing to graphics mode and then typing the appropriate characters and on the Spectrum and Spectrum+ by changing to inverse video and typing the appropriate letters. Graphics characters may be entered on the ZX-81 by changing to graphics mode and then pressing symbol shift while the appropriate characters are entered. On the Spectrum and Spectrum+ graphics characters may be obtained by changing to graphics mode and then pressing the appropriate character. User-defined graphics will appear as normal letters until the program has been RUN.

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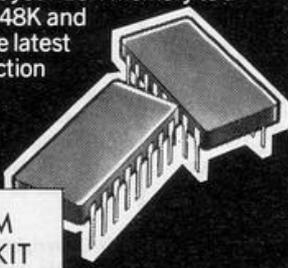
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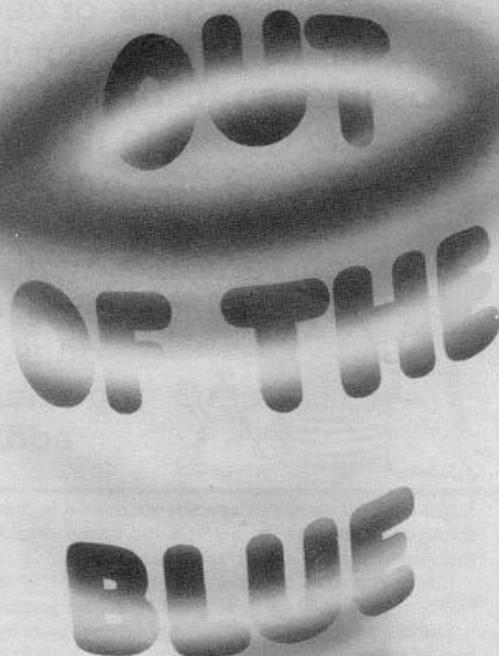
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## LETTERS

Send your thoughts to us at Letters, Sinclair Programs, Priory Court, 30-32 Farringdon Lane, London EC1. We pay £2 for every letter published.

## Loading problems

I AM writing to say that I have been buying **Sinclair Programs** for two years now, and I think that it is excellent.

I would like to know whether anyone has any loading and saving information for the ZX-81, because I have been having problems trying to save the programs which I have copied from *Sinclair Programs*. I have tried: moving the leads and changing them, changing the volume, changing the tapes, moving the tape recorder around, and moving the plugs to different power points. If you have any suggestions, please contact *Sinclair Programs*.

**Timothy Moore,  
Dawlish, Devon**

• Try cleaning the heads on your cassette recorder, Timothy. Dirt may be interfering with the recording process.

## Light pen advice

I AM writing to you about my experiences with the **Trojan light pen**. At the time I bought mine I owned a black and white television. I have now invested in a colour television and the pen will not work. When successfully loaded, the program crashes the

Spectrum's memory, causing a reset. My advice to other Spectrum owners is to check the pen on a television similar to their own before purchasing it.

**Gary Hale,  
Wallsend, Tyne & Wear**

## Decathlon impossible

After buying **Daley Thompson's Decathlon** I thought that it was great until I reached the high jump. I am sure that it is impossible. I cannot jump it even on level one.

If anybody has done it, please let me know how they did it.

**Chris Buxton,  
8 Byrl Street,  
Keighley, Yorks.**

## Helpful Menzies

FOR months and months I have been pleading with my Mum to let me buy the all-new games development program, *White Lightning*. Finally she gave in and I jogged into my local *John Menzies* and bought *White Lightning*. When I got home I quickly loaded it

and, to my surprise, the demonstration tape would not load. So, two weeks later, I returned it. At the desk, they were just about to put another copy of *White Lightning* on the shelves. I told them of my problem and they gave me a brand new replacement package. I was very pleased. I find the language extremely hard to understand so, if anyone has any tips, please let me know via *Sinclair Programs*.

**Daniel Meldrun,  
Letchworth,  
Hertfordshire.**

## High-res on the 81

ON THE subject of hi-res display on the ZX-81. I should like to share the following information with readers. The following routine sets the ZX-81's I register to 0. As the start of the Z80's dot pattern table is determined by the I register, any CHR\$ PRINTed, followed by RAND USR 16514 will be turned into a meaningless pattern. POKEing 16515,30 will return the characters to normal.

```

HEX
3E 00 LDA 0
ED 47 LD I A
C9 RET

```

```

MAIN PROGRAM
PRINT CHR$ 255
RAND USR 16514
PAUSE 4E4
POKE 16515,30
RAND USR 16514

```

**Philip Parker,  
Whitnash,  
Leamington Spa.**

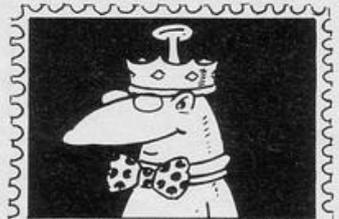
## Alchemist wanted

ON reading your September issue I saw James Sheahan's letter saying that he had completed **Sabre Wulf** from *Ultimate*. Well, I completed the game on the 4th of May this year and therefore two months before him. Sorry James, not quick enough.

I have since completed it eight times. My highest score is 154,940 with a percentage of 94. I had nine lives at two points in the game.

If anyone out there in computerland can complete the **Alchemist** I would like to know what the four objects are that you have to collect, because the game is driving me MAD.

**Stephen Barrett,  
Cramlington,  
Northumberland.**



I AM writing to tell you that Richard Bairstow, aged 12, was neither the youngest player nor the first player to solve **Lords of Midnight**. My brother, aged nine, solved **The Hobbit** when aged seven, and solved **Lords of Midnight** in September. I, on the other hand, am baffled by it, so thanks for the tips, Richard.

**Kathryn Taylor, aged 12  
Widnes, Cheshire.**

Please complete this form and enclose it with any program which you send to us for possible publication.

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# 3

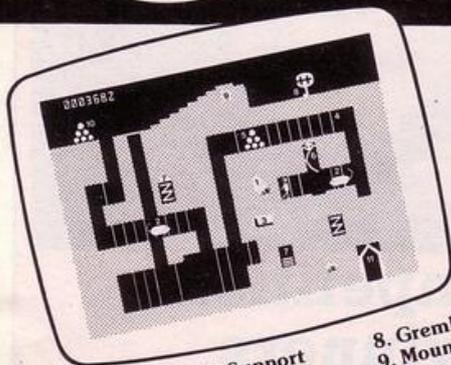


### FORTY NINER

In 1849 the Great American Gold Rush started. Almost everyone who could sold up everything and dashed to the west coast to look for this precious metal – including you!

You must excavate this precious metal – but can you survive the giant rats and that vicious Gremlin which will come to infest your mine? Can you trick the snakes into leaving their comfortable nests and destroy the rats for you? Can you keep the Gremlin at bay?

Riches await you – but so do the hazards!



1. Nuggets
2. Giant Rats
3. Burrowing Rat
4. Support
5. Cave In
6. Snake
7. Snake Nest
8. Gremlin
9. Mound
10. Pile of Earth
11. Cave

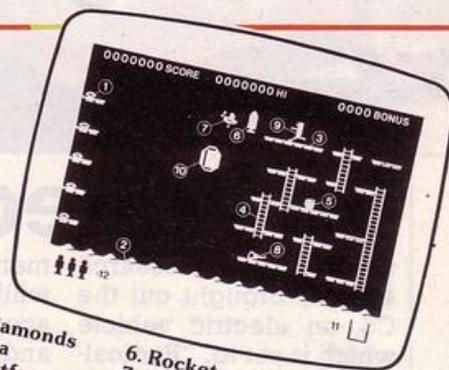
### ROCKET MAN

Get rich quick by collecting Diamonds that are simply lying there waiting for you! Oh... I forgot to mention that there are one or two problems!

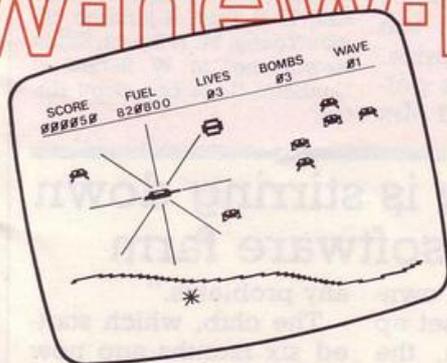
There is an expanse of shark infested water between you and the Diamonds and a strange breed of Bubble that seems hell bent on getting you in it! Somehow you must cross it....

You have a Rocket Pack to help you (a Vulture on higher levels) but you must rush around the platforms and ladders collecting cans of fuel (legs of lamb with the Vulture) and cursing that weird Bubble. Once you have enough fuel then it's Chocks Away!

Oh... but don't run out of fuel on the way – otherwise it's... SPLASH!



1. Diamonds
2. Sea
3. Platforms
4. Ladders
5. Fuel Cans
6. Rocket
7. Vulture
8. Leg of Lamb
9. Player
10. Bubloid
11. Fuel Gauge
12. Men remaining



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# NEWS



## Switched on

**S**INCLAIR Research have brought out the C5, an electric vehicle which is set to, "Radically reshape and expand the market for practical and personal transport." as Sir Clive Sinclair said at its launch.

Anybody over the age of 14 is legally entitled to drive the C5. Tax, insurance and even a licence are not required.

Driven by a rechargeable battery, the C5 is open-topped and therefore exposed to the ele-

ments, unless you are willing to pay extra for accessories. It costs £399 and its top speed is 15 m.p.h.

C5s come in one uniform colour and, since they have no distinguishing features such as registration numbers, serious misunderstandings between owners seem possible.

Advantages of the C5, apart from the low price and running expenses are that they are pollution free and quiet.

## Currah shut up

**C**URRAH, the producers of the micro-speech unit, have gone into liquidation. Dk' Tronics are taking over the trading name to become sole manufacturer of all their products; Microspeech, Microslot and Microsource.

At present Welwyn Electronics have the right to manufacture the

units, but this is expected to change as soon as their stocks are exhausted.

Both firms, for the present, are responsible for handling enquiries and may be contacted on the following numbers: Dk 'Tronics: Saffron (0799) 26350 and Welwyn Electronics: (0670) 822181.



## Cub competition: all the winners

**W**INNER of our December competition to win a Microvitec CUB Monitor, was 14 year old Robert Bibby from Radcliffe, Lancashire. He has only owned his Spectrum for six months but is already busy writing a program to help his mother with an evening course she is studying. When told of his prize Robert said "I'm really glad I won the prize because I have become a real computer freak." Robert's mother and younger brother are quickly becoming addicted to the computer themselves and all are delighted with his prize. "The television has gotten a little old," said Mrs

Bibby.

The runners-up who will receive either Fighter Pilot, Pyjamarama or Witch's Cauldron are:

Mr R. Evans, Alan Taylor, John Stevenson, Andrew Brame, John Lucas, W J de Jong, Simon Jinks, Mark Parker, Brian Walbey, David James, Simon Fowkes, Keith Thompson, Mr T Clarke, Denise Jennians, Philip Cooper, Paul Carpenter, R J Day, N F Dudley, Andrew McCrae, Mr S I Hedges, Richard Balke, Colin Gilmore, Henrik Nielsen, John Watt, John Ramsden, Neil Johnson, C and A Smith, Nigel Rogers, J Crane, M Davies, Zoe Stewart, B W Roper, Brian Traymor, S Brodie, Jamie Martin, Mr Brooke, C Arnold, Jane Lusk, Allan Schmalz, Mark Bittorf, Michael Ball, W H Tratt, R Johnson, Simon Young, Mr N Bright, Susan Newcombe, M W Barlett, P Lambeth, Colin Lee, Scott Hilton.

## Something is stirring down on the software farm

**A** CLUB for ZX-81 owners has been set up by Software Farm, the firm dedicated to producing good games for the ZX-81.

Julian Chappel, owner of Software Farm explains. "We started the club to give support to all the owners of ZX-81 machines. We wish to keep all these people up-to-date with information, new programs and generally help with

any problems."

The club, which started six months ago now has more than 200 members. There is a membership fee of £4 per year for which members receive: a quarterly newsletter, membership card, club badge and discounts of 10 per cent on any Software Farm programs. The club can be contacted through Software Farm, 155 Whiteladies Road, Clifton, Bristol.

# Through the square window

**E**ASTER will see the launch of three new games from Beyond Software, which are intended to take your Spectrum into a new dimension.

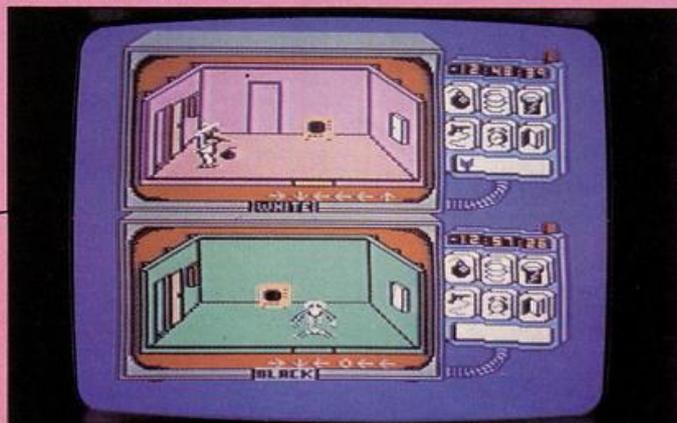
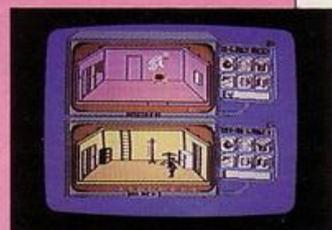
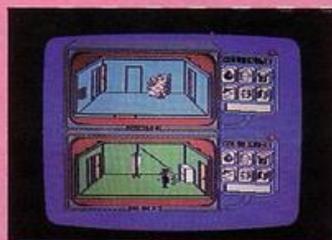
**Spy v Spy** is being converted from the successful Commodore version. Based on the characters from **MAD** magazine, it is described

as a "Simulvision game." Using arcade action, the game takes place with window effects, that is, you see two different locations on screen at the same time.

**Shadow Fire**, described as a "Text adventure without text," will be, as far as we know, the first game to incorporate the option to use a light pen. The game involves control of six individual characters set in arcade scroll scenery. "Adventure games usually involve a plot

where, to reach your final target, you must fight your way through obstacles designed to hinder your progress. We have taken this theme and used it for **Shadow Fire**," explained Marc Peirson.

**Romper Room**, is their new education program. Using different themes it takes you through the alphabet with the aid of a 'Little man who draws the letters and demonstrates their meaning.' It is aimed at 2-7 year old children and is accompanied by music.



## Hot and cold-on and off

**R**ICHARD Shepherd Software, publishers of **Inferno**, have been tempted back to producing games for the Spectrum, and will soon launch a new game.

Shepherd explained: "Although we had changed to the Commodore market, we now know that the Spectrum

is the biggest selling microcomputer in this country. Our decision has been further influenced by our new game."

Called **Ski Star 2000**, it is described as "A real 3D simulation game with highly developed qualities. The scene shows you looking through a pair of goggles onto a slalom, down which you ski."

## It's the reflex

**F**ANTASY Software are planning to launch two new games for Easter, one of which involves some hush, hush talks with a well known company.

A name has yet to be decided, but it is being referred to as **Reflex** at this stage. Without giving too much away, Paul

having discussions with one of the leading electrical-type firms in this country." The only information he was able to give was that "It will be a definite arcade game, involving a piece of equipment which will cause people to react with surprise!"

## Harassed hackers hurry to holiday in Herefordshire

**I**F YOU cannot bear the idea of leaving your computer even while you go on holiday, or if you would like to devote your spare time to learning a useful accomplishment, a computer holiday may be the one for you this year.

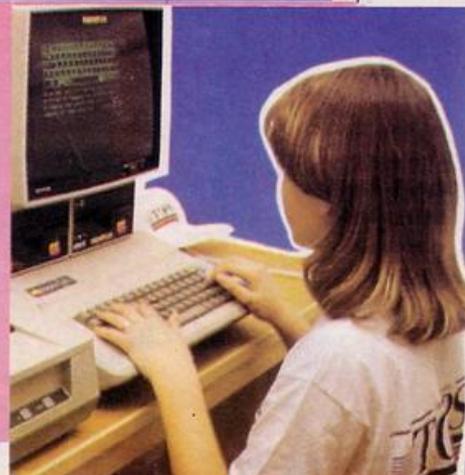
Tops are running

week-long computer holidays from March until August this year. Each student is given individual use of a BBC B or Tatung Einstein computer, and has access to the centre's other computer equipment which ranges from an extensive software library to

robotic arms.

The computer courses include study of music and graphics on the computer, as well as the opportunity to program buggies and to work on your own projects. Also included in the week are a number of outdoor activities.

For further details contact TOPS, Old Gloucester Road, Ross on Wye, Herefordshire.





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**Weston-super-Mare.** K & K Computers, 32 Alfred Street. Tel: 0934 419324.

## BEDFORDSHIRE

**Bedford.** Boots, The Harpur Centre, Harpur Street. Tel: 0234 56231.  
**Dunstable.** Dormans, 7-11 Broad Walk. Tel: 0582 38302.  
**Leighton Buzzard.** Datasine, 59 North Street. Tel: 0525 374200.  
**Leighton Buzzard.** Milton Keynes Music & Computers, 17 Bridge Street. Tel: 0525 382504.  
**Luton.** Hobbyte, Unit 16, The Armdale Centre. Tel: 0582 457195.  
**Luton.** Laskys, 190-192 Armdale Centre. Tel: 0582 38302.  
**Luton.** Terry More, 49 George Street. Tel: 0582 23391.

## BERKSHIRE

**Reading.** Heelas, Broad Street. Tel: 0734 559555.  
**Reading.** Laskys, 118-119 Prior St. Tel: 0734 595459  
**Slough.** Data Supplies, Templewood Lane, Farnham Common. Tel: 2 820004.  
**Slough.** Laskys, 75 Queensmere Centre. Tel: 0753 78269.  
**Slough.** MV Games, 245 High Street. Tel: 75 21594.

## BUCKINGHAMSHIRE

**Bletchley.** RAMS Computer Centre, 117 Queensway. Tel: 0908 647744.  
**Chesham.** Reed Photo & Computers, 113 High Street. Tel: 0494 783373.  
**Milton Keynes.** John Lewis, 11 Field Walk, Secklow Gate East, Tel: 0908 679171.

## CAMBRIDGESHIRE

**Cambridge.** Boots, 65-67 Sidney Street and 28 Petty Curry Street. Tel: 0223 350213.  
**Cambridge.** Heffers Stationers, 19 Sidney Street. Tel: 0223 358241.  
**Cambridge.** Robert Sayle, St Andrews Street. Tel: 0223 612929.  
**Peterborough.** Boots, 40-42 Bridge Street, Queensgate. Tel: 0733 65352.  
**Peterborough.** John Lewis, Queensgate Centre. Tel: 0733 44644.

## CHESHIRE

**Chester.** Boots, 47-55 Foregate Street. Tel: 0244 28421.  
**Chester.** Computer Link, 21 St Werburgh Street. Tel: 0244 316516.  
**Chester.** Laskys, 7 The Forum, Northgate Street. Tel: 0244 317667.  
**Crew.** AS Wootton & Sons, 116 Edleston Road. Tel: 0270 214118.  
**Crew.** Midshires Computer Centre, 68-78 Nantwich Road. Tel: 0270 211086.  
**Ellesmere Port.** RFR TV & Audio, 1 Pooltown Road, Whitby. Tel: 051-356 4150.  
**Hyde.** C.Tech Computers, 184 Market Street. Tel: 061-366 8223.  
**Macclesfield.** Camera Computer Centre, 118 Mill Street. Tel: 0625 27468.  
**Macclesfield.** Computer Centre, 68 Chestergate. Tel: 0625 618827.  
**Marple.** Marple Computer Centre, 30-32 Market Street. Tel: 061-427 4328.  
**Stockport.** National Micro Centres, 36 St Petersgate. Tel: 061-429 8080.  
**Stockport.** Stockport Micro Centre, 4-6 Brown Street. Tel: 061-477 0248.  
**Widnes.** Computer City, 78 Victoria Road. Tel: 051-420 3333.  
**Wilmslow.** Wilmslow Micro Centre, 62 Grove Street. Tel: 0625 530890.

## CLEVELAND

**Middlesbrough.** Boots, 88-90 Linthorpe Road, The Cleveland Centre. Tel: 0642 249616.

## CUMBRIA

**Kendal.** The Kendal Computer Centre, Stramontgate. Tel: 0539 22559.

**Whitehaven.** PD Hendren, 15 King Street. Tel: 0946 2063.  
**Workington.** Technology Store, 12 Finkle Street. Tel: 0900 66972.

## DERBYSHIRE

**Alfreton.** Gordon Harwood, 69-71 High Street. Tel: 0773 836781.  
**Chesterfield.** Boots, 35-37 Low Pavement, Market Place. Tel: 0246 203591.  
**Chesterfield.** Computer Stores, 14 Stephenson Place. Tel: 0246 208802.

## DEVON

**Exeter.** Boots, 251 High Street. Tel: 0392 32244.  
**Exeter.** Open Channel, Central Station, Queen Street. Tel: 0392 218187.  
**Plymouth.** Syntax, 76 Cornwall Street. Tel: 0752 28705.  
**Seaton.** Curtis Computer Services, Seaton Computer Shop, 51c Harbour Road. Tel: 0297 22347.  
**Tiverton.** Actron Microcomputers, 37 Bampton Street. Tel: 0884 252854.

## DORSET

**Bournemouth.** Brook Computers, 370 Charnminster Road. Tel: 0202 533054.  
**Bournemouth.** Lansdowne Computer Centre, 1 Lansdowne Crescent, Lansdowne. Tel: 0202 20165.  
**Dorchester.** The Paper Shop, Kings Road. Tel: 0305 64564.

## ESSEX

**Chelmsford.** Maxton Hayman, 5 Broomfield Road. Tel: 0245 354595.  
**Colchester.** Boots, 5-6 Lion Walk. Tel: 0206 577303.  
**Grays.** H Reynolds, 28a Southend Road. Tel: 0375 31641.  
**Harlow.** Laskys, 19 The Harvey Centre. Tel: 0279 443495.  
**Hornchurch.** Comptel Computer Systems, 112a North Street. Tel: 0402 446741.  
**Ilford.** Boots, 177-185 High Road. Tel: 01-553 2116.  
**Southend-on-Sea.** Computerama, 88 London Road. Tel: 0702 335443.  
**Southend-on-Sea.** Computer Centre, 336 London Road. Tel: 0702 337161.  
**Southend-on-Sea.** Estuary Personal Computers, 318 Chartwell North, Victoria Circus Shopping Centre. Tel: 0702 614131.

## GLOUCESTER

**Cheltenham.** Laskys, 206 High Street. Tel: 0242 570282.  
**Cheltenham.** Screen Scene, 144 St Georges Road. Tel: 0242 528979.  
**Gloucester.** Boots, 38-46 Eastgate Street. Tel: 0452 423501.

## HAMPSHIRE

**Basinstoke.** Fishers, 2-3 Market Place. Tel: 0256 22079.  
**Southampton.** Business Electronics, Micromagic At Atkins, 7 Civic Centre Road. Tel: 0703 25903.  
**Southampton.** Tyrrell & Green, Above Bar. Tel: 0703 27711.

## HERTFORD

**Hitchin.** County Computers, 13 Bucklesbury. Tel: 0462 36757.  
**Hitchin.** GK Photographic & Computers, 68 Hermitage Road. Tel: 0462 59285.  
**Potters Bar.** The Computer Shop, 197 High Street. Tel: 0707 44417.  
**Stevenage.** DJ Computers, 11 Town Square. Tel: 0438 65501.  
**Watford.** Laskys, 18 Charter Place. Tel: 0923 31905.  
**Watford.** SRS Microsystems, 94 The Parade, High Street. Tel: 0923 26602.  
**Watford.** Irewins, Queens Road. Tel: 0923 44266.  
**Welwyn Garden City.** DJ Computers, 40 Frertherne Road. Tel: 96 28444.  
**Welwyn Garden City.** Welwyn Department Store. Tel: 0707 323456.

## HUMBERSIDE

**Beverley.** Computing World, 10 Swabys Yard, Dyer Lane. Tel: 0482 881831.

## KENT

**Beckenham.** Supa Computers, 425 Croydon Road. Tel: 01-650 3569.

**Bexleyheath.** Laskys, 15-16 Broadway Shopping Centre. Tel: 01-301 3478.  
**Bromley.** Boots, 148-154 High Street. Tel: 01-460 6688.  
**Bromley.** Computers Today, 31 Market Square. Tel: 01-290 5652.  
**Bromley.** Laskys, 22 Market Square. Tel: 01-464 7829.  
**Bromley.** Walters Computers, Army & Navy, 64 High Street. Tel: 01-460 9991.  
**Chatham.** Boots, 30-34 Wilmott Square, Pentagon Centre. Tel: 0634 405471.  
**Sevenoaks.** Ernest Fielder Computers, Dorset Street. Tel: 0732 456800.  
**Sittingbourne.** Computer Plus, 65 High Street. Tel: 0795 25677.  
**Tunbridge Wells.** Modata Computer Centre, 28-30 St Johns Road. Tel: 0892 41555.

## LANCASHIRE

**Blackburn.** Tempo Computers, 9 Railway Road. Tel: 0254 691333.  
**Blackpool.** Blackpool Computer Store, 179 Church Street. Tel: 0253 20239.  
**Burnley.** IMO Business Systems, 39-43 Standish Street. Tel: 0282 54299.  
**Preston.** 4Mat Computing, 67 Friargate. Tel: 0772 561952.  
**Preston.** Laskys, 1-4 Guildhall Arcade. Tel: 0772 24558.  
**Wigan.** Wildings Computer Centre, 11 Mesnes Street. Tel: 0942 44382.

## LEICESTERSHIRE

**Leicester.** Boots, 30-36 Gallowtree Gate. Tel: 0533 21641.  
**Market Harborough.** Harborough Home Computers, 7 Church Street. Tel: 0858 63056.

## LONDON

**W1.** Computers of Wigmore Street, 104 Wigmore Street. Tel: 01-486 0373.  
**W1.** HMV, 363 Oxford Street. Tel: 01-629 1240.  
**W1.** John Lewis, Oxford Street. Tel: 01-629 7711.  
**W1.** Laskys, 42 Tottenham Court Road. Tel: 01-636 0845.  
**W1.** Lion House, 227 Tottenham Court Road. Tel: 01-637 1601.  
**W1.** Rother Cameras, 256 Tottenham Court Road. Tel: 01-580 5826.  
**W1.** The Video Shop, 18 Tottenham Court Road. Tel: 01-580 5380.  
**W1.** Walters Computers, DH Evans, Oxford Street. Tel: 01-629 8800.  
**W1.** Transam Micro Systems, 59-61 Theobalds Road. Tel: 01-405 5240.  
**W5.** Laskys, 18-19 Ealing Broadway Shopping Centre. Tel: 01-567 4717.  
**W8.** Walters Computers, Barkers, Kensington High Street. Tel: 01-937 5432.  
**SW1.** Peter Jones, Sloane Square. Tel: 01-730 3434.  
**SE9.** Square Deal, 373-375 Footscray Road, New Etham. Tel: 01-859 1516.  
**Lewisham.** Laskys, 164 High Street. Tel: 01-852 1375.  
**SE13.** Walters Computers, Army & Navy, 33 and 63 High Street, Lewisham. Tel: 01-852 4321.  
**SE15.** Castlehurst Ltd, 152 Rye Lane, Peckham. Tel: 01-639 2205.  
**EC2.** Devron Computer Centre, 155 Moorgate. Tel: 01-638 3339.  
**N7.** Jones Brothers, Holloway Road. Tel: 01-607 2727.  
**N14.** Logic Sales, 19 The Bourne, The Broadway, Southgate. Tel: 01-882 4942.  
**NW3.** Maycraft Micros, 58 Rosslyn Hill, Hampstead. Tel: 01-431 1300.  
**NW4.** Davinci Computer Store, 112 Brent Street, Hendon. Tel: 01-202 2272.  
**NW7.** Computers Inc, 86 Golders Green. Tel: 01-209 0401.  
**NW10.** Technomatic, 17 Burnley Road, Wembley. Tel: 01-208 1177.

## MANCHESTER

**Manchester.** Boots, 32 Market Street. Tel: 061-832 6533.  
**Manchester.** Laskys, 61 Arndale Centre. Tel: 061-833 9149.  
**Manchester.** Laskys, 12-14 St Marys Gate. Tel: 061-833 0268.  
**Manchester.** Mighty Micro, Sherwood Centre, 268 Wilmslow Road, Fallowfield. Tel: 061-224 8117.

**Manchester.** NSC Computer Shops, 29 Hanging Ditch. Tel: 061-832 2269.  
**Oldham.** Home & Business Computers, 54 Yorkshire Street. Tel: 061-633 1608.  
**Swinton.** Mr Micro, 69 Partington Lane. Tel: 061-728 2282.

## MERSEYSIDE

**Heswall.** Thornguard Computer Systems, 46 Pensby Road. Tel: 051-342 7516.  
**Liverpool.** George Henry Lee, Basnett Street. Tel: 051-709 7070.  
**Liverpool.** Hargreaves, 31-37 Warbreck Moor, Walton. Tel: 051-525 1782.  
**Liverpool.** Laskys, Dale Street. Tel: 051-236 3298.  
**Liverpool.** Laskys, St Johns Precinct. Tel: 051-708 5871.  
**St Helens.** Microman Computers, Rainford Industrial Estate, Mill Lane, Rainford. Tel: 0744 885242.  
**Southport.** Central Studios, 38 Eastbank Street. Tel: 0704 31881.

## MIDDLESEX

**Enfield.** Laskys, 44-48 Palace Garden Shopping Centre. Tel: 01-363 6627.  
**Harrow.** Camera Arts, 42 St Anns Road. Tel: 01-427 5469.  
**Hounslow.** Boots, 193-199 High Street. Tel: 01-570 0156.  
**Teddington.** Andrews, Broad Street. Tel: 01-977 4716.  
**Twickenham.** Twickenham Computer Centre, 72 Heath Road. Tel: 01-892 7896.  
**Uxbridge.** JKL Computers, 7 Windsor Street. Tel: 0895 51815.

## NORFOLK

**Norwich.** Bonds, All Saints Green. Tel: 0603 24617.

## NOTTINGHAMSHIRE

**Sutton in Ashfield.** H.N & L Fisher, 87 Outram Street. Tel: 0623 54734.  
**Nottingham.** Jessops, Victoria Centre. Tel: 0602 418282.  
**Nottingham.** Laskys, 1-4 Smithy Row. Tel: 0602 413049.

## OXFORDSHIRE

**Abingdon.** Ivor Fields Computers, 21 Stert Street. Tel: 0235 21207.  
**Banbury.** Computer Plus, 2 Church Lane. Tel: 0295 55890.  
**Oxford.** Science Studio, 7 Little Clarendon Street. Tel: 0865 54022.

## SCOTLAND

**Edinburgh.** Boots, 101-103 Princes Street. Tel: 031-225 8331.  
**Edinburgh.** John Lewis, St James Centre. Tel: 031-556 9121.  
**Edinburgh.** Laskys, 4 St James Centre. Tel: 031-556 1864.  
**Glasgow.** Boots, 200 Sauchiehall Street. Tel: 041-332 1925.  
**Glasgow.** Boots, Union Street and Argyle Street. Tel: 041-248 7387.

## SHROPSHIRE

**Telford.** Telford Electronics, 38 Mall 4. Tel: 0952 504911.

## STAFFORDSHIRE

**Newcastle-under-Lyme.** Computer Cabin, 24 The Parade, Silverdale. Tel: 0782 636911.  
**Stafford.** Computerama, 59 Foregate Street. Tel: 0785 41899.  
**Stoke-on-Trent.** Computerama 11 Market Square Arcade, Hanley. Tel: 0782 268524.

## SUFFOLK

**Bury St Edmunds.** Boots, 11-13 Cornhill. Tel: 0284 701516.  
**Ipswich.** Brainwave Micros, 24 Crown Street. Tel: 047 350965.

## SURREY

**Croydon.** Laskys 77-81 North End. Tel: 01-681 8443.  
**Croydon.** The Vision Store, 96-98 North End. Tel: 01-681 7539.  
**South Croydon.** Concise Computer Consultants, 1 Carlton Road. Tel: 01-681 6842.  
**Epson.** The Micro Workshop, 12 Station Approach. Tel: 0372 721533.  
**Guildford.** Walters Computers, Army & Navy, 105-111 High Street. Tel: 0483 68171.  
**Haslemere.** Haslemere Computers, 17 Lower Street. Tel: 0428 54428.  
**Wallington.** Surrey Micro Systems, 53 Woodcote Road. Tel: 01-647 5636.  
**Woking.** Harpers, 71-73 Commercial Way. Tel: 0486 225657.

## SUSSEX

**Bexhill-on-Sea.** Computerware, 22 St Leonards Road. Tel: 0424 223340.  
**Brighton.** Boots, 129 North Street. Tel: 0273 27088.  
**Brighton.** Gamer, 71 East Street. Tel: 0273 728681.  
**Brighton.** Laskys, 151-152 Western Road. Tel: 0273 725625.  
**Crawley.** Gatwick Computers, 62 The Boulevard. Tel: 0293 37842.  
**Crawley.** Laskys, 6-8 Queensway. Tel: 0293 544622.

## TYNE & WEAR

**Newcastle-upon-Tyne.** Bainbridge, Eldon Square. Tel: 0632 325000.  
**Newcastle-upon-Tyne.** Boots, Eldon Square. Tel: 0632 329844.  
**Newcastle-upon-Tyne.** Laskys, 6 Northumberland Street. Tel: 0632 617224.  
**Newcastle-upon-Tyne.** RE Computing, 12 Jesmond Road. Tel: 0632 815580.

## WALES

**Aberdare.** Inkey Computer Services, 70 Mill Street, The Square, Aberystwyth. Tel: 0685 881828.  
**Aberystwyth.** Aberdare at Galloways, 23 Pier Street. Tel: 0970 615522.  
**Cardiff.** Boots, 26 Queens Street & 105 Frederick Street. Tel: 0222 31291.  
**Cardiff.** P & P Computers, 41 The Hayes. Tel: 0222 26666.  
**Swansea.** Boots, 17 St Marys Arcade, The Quadrant Shopping Centre. Tel: 0792 43461.

## WARWICKSHIRE

**Coventry.** Coventry Micro Centre, 33 Far Gosford Street. Tel: 0203 58942.  
**Coventry.** JBC Micro Services, 200 Earlsdon Avenue, North Earlsdon. Tel: 0203 73813.  
**Coventry.** Laskys, Lower Precinct. Tel: 0203 27712.  
**Leamington Spa.** IC Computers, 43 Russell Street. Tel: 0926 36244.  
**Leamington Spa.** Leamington Hobby Centre, 121 Regent Street. Tel: 0926 29211.  
**Nuneaton.** Micro City, la Queens Road. Tel: 0203 382049.  
**Rugby.** OEM Computer Systems, 9-11 Regent Street. Tel: 0788 70522.

## WEST MIDLANDS

**Birmingham.** Boots, City Centre House, 16-17 New Street. Tel: 021-643 7582.  
**Birmingham.** Laskys, 19-21 Corporation Street. Tel: 021-632 6303.  
**Dudley.** Central Computers, 35 Churchill Precinct. Tel: 0384 238169.  
**Stourbridge.** Walters Computer Systems, 12 Hagley Road. Tel: 0384 370811.  
**Walsall.** New Horizon, 1 Goodall Street. Tel: 0922 24821.  
**West Bromwich.** D S Peakman, 7 Queens Square. Tel: 021-525 7910.  
**Wolverhampton.** Laskys, 2 Wulfrum Square. Tel: 0902 714568.

## YORKSHIRE

**Bradford.** Boots, 11 Darley Street. Tel: 0274 390891.  
**Leeds.** Boots, 19 Albion Arcade, Bond Street Centre. Tel: 0532 33551.  
**Sheffield.** Cole Brothers, Barkers Pool. Tel: 0742 78511.  
**Sheffield.** Laskys, 58 Leopold Street. Tel: 0742 750971.  
**York.** York Computer Centre, 7 Stonegate Arcade. Tel: 0904 641862.



1	Daley's Decathlon	Ocean
2	Sabre Wulf	Ultimate
3	Lords of Midnight	Beyond
4	Jet Set Willy	Software Projects
5	Knight Lore	Ultimate
6	The Hobbit	Melbourne House
7	Manic Miner	Software Projects
8	Ghostbusters	Activision
9	Matchday	Ocean
10	Pyjamarama	Mikrogen

## HEIGHTS ↑ DEPTHS ↓

1	Transylvanian Tower	Richard Shepherd
2	Make a chip	Sinclair
3	Chequered Flag	Psion
4	3D Tunnel	New Generation
5	Vu 3D	Psion

To register your votes, let us know the program you like most, and the program you hate most. Add your name and address, which will make you eligible for the £10 chart prize. Send your votes to CHARTLINE, Sinclair Programs, Priory Court, 30-32 Farringdon Lane, London EC1R 3AU.

Winner of this month's chart prize is Jennifer Millar of Bangor, County Down.

# GOD GIVEN

## GIFT OF THE GODS

**T**HE trend in 1984 was towards George Orwell and modern literature. Computer games in 1985 seem to be reacting against this, with a strong movement towards Greek mythology. **Gift from the Gods** takes up the classical story of Orestes. You star as Orestes, and your aim is to avenge the murder of your father, Agamemnon, by your mother Clytaemnestra. In doing so you have the help of your sister, Electra and the gods Zeus and Apollo.

All good stuff and, for

once, a powerful storyline is backed by an excellent game. Gift from the Gods takes the form of an animated adventure in which Orestes moves through the labyrinth, flies through the air, fights the monsters and attempts to find and follow his sister.

Orestes' aim is to find the six Euclidian shapes which will reveal the exit to the labyrinth when positioned correctly in the Guardian's chamber. Orestes is opposed by the demi-gods who live in the Guardian's chamber. They use their

powers of illusion in order to prevent discovery of the shapes.

Electra knows where to find the correct six shapes, but Clytaemnestra knows of her purpose and is trying to kill her, and to steal the shapes. Another problem is the terrifying illusory creatures created by the demi-gods to sap Orestes' strength. Enormous spiders, skulls with worms twisting through

their eye sockets, any amount of weird creatures which you would fear to meet in broad daylight not alone in a hostile maze.

Great fun and very complex, Gift from the Gods is produced by Ocean Software, Ocean House, 6 Central Street, Manchester M2 5NS.

**Price: £9.95**

**Game type: Animated adventure**

**Rating: 79%**



## AIRWOLF

**J**UDGING difficulty levels in a game is never easy for a reviewer. If a game appears easy is that because the reviewer has played ten other games like it in the past week? If it appears difficult, is that because the reviewer has not devoted enough time to it?

However, without qualification, **Airwolf** can be defined as difficult to the point of absurdity. The first screen is easy enough, for there are no obstacles to overcome, but on the second screen your way is blocked by a massive wall. Touching the wall or the ground below it means certain death, but in order to shoot a passage through it, you must steer your helicopter up and down it many times.

A further problem is that the wall rebuilds itself very quickly, so you only have a short period in which to shoot your way through.

It is not impossible to get through this wall, although it is probably next to impossible if you do not possess a joystick. After half an hour's work from six reviewers, one finally made it through the wall only to meet... another wall.

Those people who are attracted to Airwolf with the aim of 'beating the reviewers' may be interested to know that the game sets you up as Stringfellow Hawke, the only man who can fly the billion dollar helicopter Airwolf and, therefore, the man who can save five US scientists.

Airwolf is produced by Elite Systems Ltd, 55 Bradford Street, Walsall.

**Price: £6.95**

**Game type: Arcade**

**Rating: 10%**



## SKOOLDAZE

**T**AKE 600 lines boy, you are not a kangaroo, barks the harsh history master. Not an auspicious start to **Skooldaze**, and there is worse to follow. You arrive in your geography class to find that overcrowding in schools is worse than you thought. There are six boys, and only four seats. Two people are going to have to stand. Well aware that if you stand you will be given lines, you push the swot, Einstein, out of his seat. The creep pushes you out again. You push the smallest boy in the school to the floor and sit down smugly. The master enters and begins the lesson as the smallest boy pushes the next boy to the floor, he then pushes the tearaway down, the tearaway hits the bully, the bully and the swot fight for a seat, and then the inevitable happens, the bully pushes you to the floor. The master looks up

from the list of questions he is reeling off, "600 lines, Eric, get off the floor immediately", "Oh, but sir..."

Your main worry, though, is not the injustice of school life, but the fact that, locked in the school safe, is your school report. This is bound to be bad news if anyone sees it, so you find and destroy it. How? Now, that is a good question. Each of the masters knows one element of the safe combination. Of course, though, they do not want to tell it to you. Your only chance is to set all the shields in the school flashing in order to disorientate the masters, and then knock the masters down so that they involuntarily shout out part of the code. A very complex plan.

Produced by Microsphere, 72 Roseby Road, London N10.

**Price: £5.95**

**Game type: Arcade**

**Rating: 75%**

## GHOSTBUSTERS

**S**URELY no program can have achieved as much popularity before its launch as has **Ghostbusters**. Three weeks before its launch it was already in the top ten of one computer magazine. Even *Sinclair Programs* readers were naming it as their favourite game before it went on sale.

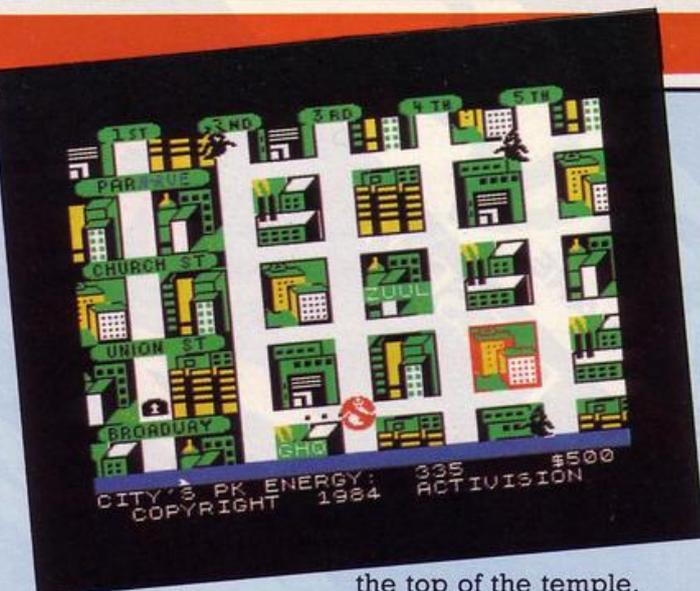
Sadly, this enthusiasm is misplaced. Much of the appeal of the film on which the game was based lay in its humour and its use of sound. The game follows the plot of the film faithfully without ever catching its mood.

The first stage of the game involves collecting your ghost busting equipment. This could

be done quickly and simply, but instead you have to manoeuvre a fork lift truck to collect items. A slow way of covering one of the less interesting parts of the game.

Despite a rousing, if rather tinny, version of the Ghostbusters theme before the game begins, the game continues in stony silence. An exception to this is the occasional use of speech, created without any hardware add-ons. A clever effect, but a more lively use of sound throughout the game would have been better.

The game involves catching some ghosts, and preventing others



from reaching the Temple of Zuul. Success will lead to fat profits for your ghost busting business which are essential to your success in the game. Eventually you must make your way to the Temple of Zuul, sneak in, and make your way to the entrance at

the top of the temple.

Ghostbusters is a straightforward game with little to recommend it. It is produced by Activision, 15 Harley House, Marylebone Road, Regents Park, London NW1.

**Price: £9.99**

**Game type: Arcade**

**Rating: 40%**

## AIR TRAFFIC CONTROL

**S**OME simulations are games, intended purely for enjoyment. Others make claims to be completely accurate simulations, and they have considerable educational value as well as being fun. **Heathrow International Air Traffic Control** falls into the latter category.

The program comes in two parts. One side allows you to simulate controlling air traffic at Heathrow airport, the other side allows you to try out the same job at Schiphol airport.

The programs are divided into eight levels. Level one allows you to practice landing light aircraft at your airport. By level eight you have to cope with incoming and outgoing aircraft of

all types, the likelihood that one aeroplane will declare an emergency and have to land as soon as possible and the possibility that some of your equipment will break down, you will lose radio contact with one plane.

The programs are startling in their complexity, but their accuracy does, in some ways, lower their appeal. After all, while it is interesting to understand the problems of an air traffic controller, it is not necessarily fun to have to deal with them all, or to have train yourself to the skill level necessary to complete even the simplest operation.

Detailed, but perhaps rather more worthy than fun Air Traffic Control is produced for the 48K Spectrum by Hewson Consultants, 60a St Mary's Street, Wallingford, Oxfordshire.

**Price: £7.95**

**Game type: Simulation**

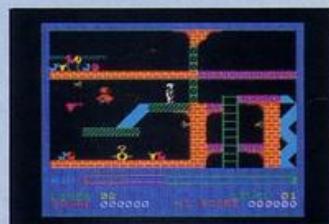
**Rating: 65%**

## SON OF BLAGGER

**I**T IS safe to say that I liked **Jet Set Willy**, you liked **Jet Set Willy**, we all liked **Jet Set Willy**. It is safe to say that because sales figures, charts, readers' letters, readers' votes and reviews all agree on these points. What it is not safe to say, bearing these things in mind, is that we will all like every game which is based on the **Jet Set Willy** theme.

There are major differences between **Son of Blagger** and **Jet Set Willy**, but it is the latter which wins in every case. As **Slippery Sid**, the son of **Blagger**, you must make your way through the Spectrum Security Headquarters, collect the golden keys from the maze of passages in the complex.

Sid is larger than **Willy**, the screen scrolls smoothly from one part of the maze to another rather than changing



only when you leave a room, the monsters and layouts are different in both games. Despite these differences it is obvious from the moment the first room appears on screen where the idea for **Son of Blagger** came from.

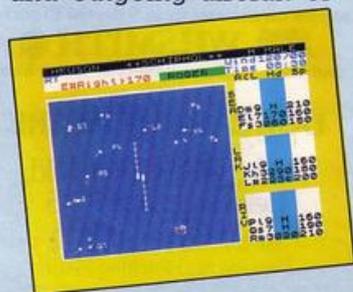
Unfortunately, the idea is a failure. The game shows the fragility of the success of **Jet Set Willy**, how easily it could have slipped from the excellent to the mundane if it had shed its quirky humour and all the small touches which made it a pleasure to move from one room to the next.

**Son of Blagger** is produced for the 48K Spectrum by Alligata Software, 1 Orange Street, Sheffield.

**Price: £5.95**

**Game type: Arcade**

**Rating: 40%**



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- Sound Effects

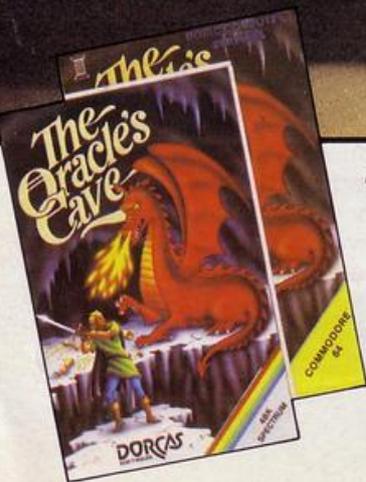
The tiny principality of DORCASIA was a pleasant fertile land until the wizard ZENDOS used his evil powers to cast the country into perpetual darkness until all citizens pledge obedience to him.

It is known that through the SPELL OF DARKNESS Zendo has trapped the spirit of each month into one of 12 GOLDEN TEMPUS RUNES or RUNIC HOUR GLASSES hidden deep within his mysterious and magical castle.

As the land dies in the grip of the black desolation a hero must be found to locate and destroy the 12 hour glasses thus releasing the months and returning Dorcasia to the natural forces of the seasons.

Each glass has a RUNIC inscription around its base which you must read and understand. Only saying these words will lift that part of the spell. To protect the hour glasses Zendo has placed them in 12 separate rooms in his castle, each room linked to a different exterior gateway by a devious route.

Depending on which entrance you select Zendo casts spells which change the locations of rooms within his castle to confuse you. The menacing creatures and challenging problems which confront you at every turn mean that only the brave and the clever will succeed.



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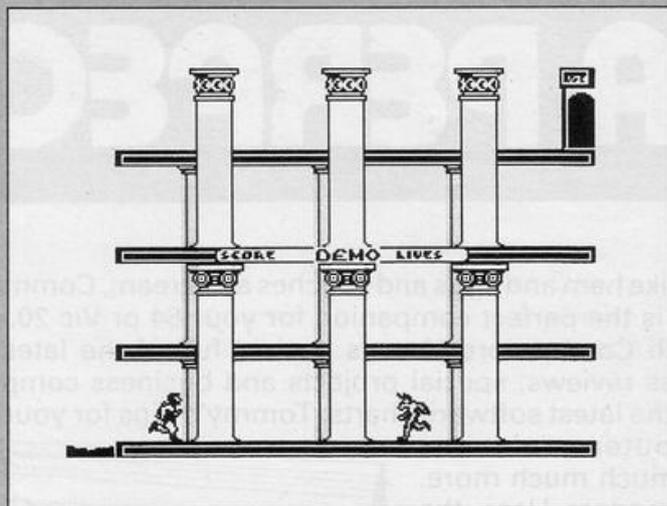
## HELLFIRE

**T**HE incongruity of the combination of literary epic and computer game appears to appeal to software houses. Melbourne House have taken up this genre once again with the release of **Hellfire**, a computerised version of the trials of Ulysses.

The first screen sees you, as Ulysses, jumping from slope to slope up to the top of Mount Olympus, avoiding the bouncing boulders which fall from time to time. If you delay your ascent for too long, the Gorgon will appear at the top of the screen and start giving you dirty looks, so it is best to move quickly. Classical **Donkey Kong**, whatever next?

Next is an extremely original screen, you move into a maze-like sacred temple. It looks simple to negotiate, but running behind the first pillar brings you out on the fourth floor, and trying to run back again transports you to the third floor. To make matters worse, a minotaur, apparently oblivious to the maze-like qualities of the place, is charging around the first floor, and another one is likely to appear if you hang around for too long. Your route is likely to tend toward the circular unless you bear in mind that the temple door mat can be used as a springboard.

Having passed through the Temple of



Knossos you then pass onto another maze which, this time, is inhibited by the reptilian Assassin and the Fireball Thrower. Solve this maze and you can join your friends in the Elysium Fields and make it into the ranks of the superhero gods.

Great fun, although probably slightly too easy for experienced arcade game players, Hellfire is produced for the 48K Spectrum by Melbourne House, Church Yard, Tring, Herts.

**Price: £6.95**

**Game type: Arcade**

**Rating: 70%**

## GREAT SPACE RACE

**L**EGEND promised great things of **The Great Space Race**. Characters with animated faces; a program that goes one step beyond their last program, **Valhalla**; a development of the computer movie concept: all these were



promised, and have been delivered. Unfortunately, it all goes wrong.

The game centres around delivery of the potent intoxicant, Natof, to ninety six different planets. Staff must be chosen, equipped and guided in order to deliver Natof to all planets as quickly as possible.

Choice of staff is important, and choices can be made based on the accompanying booklet, and on experience

gained from past games. Some characters spend all their time asking whether they can fight pirates, and get very little work done. Others drink Natof too frequently, and have to be dried out at great expense. Others never ask you for guidance, and spend their time visiting the same planets.

The main problem is that, true to the computer movie formula, the game virtually plays itself, and all decisions will be made for you if you do not enter an an-

swer quickly enough. As this is a long game, and bound to take over an hour to complete, it is easy to lose concentration for vital seconds, and thus miss your opportunity to make important decisions.

There is little to hold the attention in a game which plays itself.

The Great Space Race is produced for the 48K Spectrum by Legend, PO Box 435, Station Road, London E4.

**Price: £14.95**

**Game type: Simulation**

**Rating: 45%**

## AFGHAN ATTACK

**D**ESPITE the disclaimer in the introduction to **Afghan Attack** that the title is of no political significance, it seems likely that the title will probably discourage potential purchasers of any political persuasion.

The game itself is definitely aimed at the more war-mongering adven-

turer. The situation at the beginning of the game is that you and your troops have just been airlifted into Afghanistan. Your helicopter has been camouflaged and it is now up to you to make the decisions.

The game has several special features including real time simulation and the opportunity to

communicate with allies. This communication is, however, fairly limited. Your sergeants and corporals are always happy to be told to open fire, or to do something suitably militaristic, but they are less enthusiastic about being helpful, being ordered around when it does not suit them, or simply indulging in lighthearted banter.

The vocabulary of the game appears to omit

many of the most common adventure terms, and employs many words specific to the situation. This is, at first, difficult to adapt to, as war simulation is an unusual subject for an adventure.

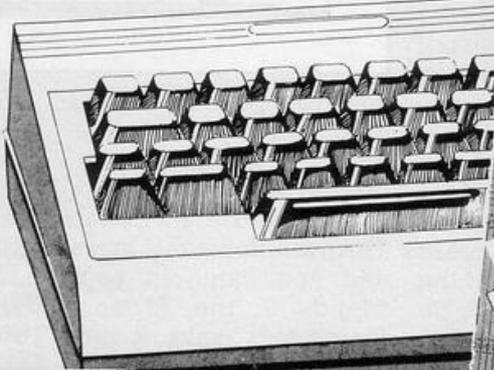
Afghan Attack is produced for the 48K Spectrum by Southern Software, 6 The Hillway, Fareham, Hampshire.

**Game type: Adventure**

**Rating: 45%**

# A PERFECT COUPLE

Just like ham and eggs and peaches and cream, Commodore User is the perfect companion for your 64 or Vic 20. Every month Commodore User is packed full of the latest new games reviews, special projects and business computing, plus the latest software charts, Tommy's Tips for your tricky computer problems, and much much more. Commodore User, the perfect magazine for Commodore owners, at your newsagent on the first of every month. All for only 95p.



## The March Issue of Electronics & Computing Monthly on sale February 13th includes...

Mike James with the definitive description of the operation of the BBC micro.  
Paul Beverley with some thought on the implementation of low-cost BBC micro networks.

An in-depth look at the technology of portable computers, advances in LCD display manufacture, in CMOS device fabrication and in high density mass storage systems.

We know all our readers don't have BBC machines so we'll also make sure there is plenty to interest QL, Spectrum, Commodore... owners with our wide range of projects, features and extensive news coverage.

### ELECTRONICS & COMPUTING

# COMPETITION

## ROCKET MAN, FORTY NINER, ZX-TRICATOR



### TWENTY SETS OF SOFTWARE FARM'S COMPLETE HI-RES RANGE TO BE WON.

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Since the launch of the ZX-81 computer nothing in the ZX-81 world has equalled the excitement generated by the launch of **Forty Niner**, the first game produced by Software Farm featuring high-resolution graphics. Before that time, Software Farm had been known to computer owners for games such as **Asteroid** and **Gobblers**. Forty niner signalled a revolution in people's view of what could be achieved on the ZX-81. Since then the company's logo, the cosmic cockerel, has signalled the best ZX-81 software on the market.

To win a complete set of high resolution programs for the ZX-81, study the word square opposite. Hidden within it are ten words or phrases relating to Software Farm, their games, their logo, their graphics, and where their games might appear in *Sinclair Programs*. Words appear in straight lines either horizontally, vertically or diagonally. Some letters may be used in more than one word. We have shaded one word as an example. Simply find the other ten, shade them in on the grid, fill in your name and address, and send the completed form to: Sinclair

Programs, EMAP, Priory Court, 30-32 Farringdon Lane, London EC1R 3AU, to arrive before March 31st.

T	F	O	R	T	Y	N	I	N	E	R	S
O	Z	C	T	R	C	I	M	S	O	C	
P	X	E	I	G	O	D	O	G	F	C	S
S	T	P	H	R	C	A	N	T	N	K	O
T	R	S	I	I	K	A	W	M	O	E	F
F	I	C	L	A	E	A	I	E	S	T	T
O	C	N	S	P	R	O	G	S	E	M	F
S	A	I	A	E	E	I	T	I	R	A	O
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M	A	S	T	E	R	O	I	D	H	U	Z

NAME .....

ADDRESS .....

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Employees of Software Farm and EMAP are not eligible to enter. The editor's decision in all matters concerning the competition is final.

Your top-secret, inter-temporal spying mission involves leaving the twentieth century to cross The Cavern of Time. Access to other centuries is closely guarded, and flying too low will invite a rocket attack, while flying too high may mean that you crash into the roof of the cavern.

Written for the 16K ZX-81 by Jason Perry of Devizes, Wiltshire.

```
1 PRINT AT 0,7;"CAVERN OF TIME"
2 PRINT "USE KEYS 8 FOR ACROSS
3 6 FOR DOWN 7 FOR UP AND 5 FOR
BOHBS"
3 PRINT "IF YOU FLY TO LOW YO
U COULD GET HIT BY A ROCKET AND
IF YOU FLY TO HIGH YOU MIGHT HIT
THE CAVERN WALLS AND BLOW UP"
4 PRINT "YOUR MISSION IS TO GET
TO THE OTHER SIDE OF THE SCREE
IN 50 SECONDS OR LESS OTHER W
ISE YOU WILL BLOW UP"
5 PRINT "ALSO TO DESTROY AS M
ANY TARGETS AS POSSIBLE, IF YOU H
IT A FUEL DUMP YOUR FUEL WILL GO
UP 5. IF YOU HIT AN AMMUNITION B
ASE YOU WILL GET 10 POINTS AND I
F YOU HIT A ROCKET YOU WILL GET
1 POINT"
6 PRINT "AFTER YOU HAVE FINIS
HED READING PRESS NEWLINE"
7 INPUT A$
8 IF A$=" " THEN GOTO 9
9 CLS
10 REM GRAPHICS FOR VALLEY
20 FOR C=0 TO 21
30 PRINT AT C,0;"
40 NEXT C
50 PRINT AT 9,0;"
60 PRINT AT 10,0;"
70 PRINT AT 11,0;"
80 PRINT
90 PRINT
100 PRINT
110 PRINT
120 PRINT
130 PRINT AT 17,0;"
170 REM TARGETS
180 PRINT AT 13,0;"
190 PRINT AT 14,0;"
200 PRINT AT 14,26;"
200 PRINT AT 14,26;"
```

```
=12 AND A=23 OR B=12 AND A=24 TH
EN STOP
306 IF B=15 AND A=28 OR B=17 AN
D A=27 OR B=14 AND A=29 OR B=14
AND A=26 OR B=16 AND A=1 OR B=16
AND A=12 OR B=16 AND A=17 OR B=16
1 AND A=9 OR B=16 AND A=16 OR B=1
15 AND A=10 OR B=5 AND A=20 OR B=
5 AND A=25 THEN PRINT AT B,A;"
/"
307 IF B=15 AND A=28 OR B=17 AN
D A=27 OR B=14 AND A=29 OR B=14
AND A=26 OR B=16 AND A=1 OR B=16
AND A=12 OR B=16 AND A=17 OR B=16
1 AND A=9 OR B=16 AND A=16 OR B=1
15 AND A=10 OR B=5 AND A=20 OR B=
5 AND A=25 THEN STOP
320 IF INKEY$="6" THEN LET B=B+
1
330 IF INKEY$="7" THEN LET B=B-
1
340 IF INKEY$="8" THEN LET A=A+
1
345 IF INKEY$="B" THEN GOSUB 45
0
346 PRINT AT B,A;" " AT B,A;" "
347 IF B=15 AND A=27 OR B=14 AN
D A=27 OR B=16 AND A=27 THEN PRI
NT AT 17,27;" " AT 16,27;" " AT
16,27;" " AT 14,27;" " AT 14,27;" " AT
13,27;" " AT 13,27;" "
348 IF B=13 AND A=27 OR B=14 AN
D A=27 OR B=15 AND A=27 THEN PRI
NT AT B,A-1;" "
349 IF B=13 AND A=27 OR B=14 AN
D A=27 OR B=15 AND A=27 THEN STO
P
350 IF B=12 AND A=28 OR B=13 AN
D A=28 THEN PRINT AT 15,28;" " A
T 14,28;" " AT 14,28;" " AT 13,2
8;" " AT 13,28;" " AT 12,28;" "
/"
```



# Cavern of Time

```
AT 12,28;" " AT 11,28;"R"; AT 11,
28;"
351 IF B=12 AND A=28 OR B=13 AN
D A=28 THEN PRINT AT B,A-1;" "
352 IF B=12 AND A=28 OR B=13 AN
D A=28 THEN STOP
354 IF B=15 AND A=5 OR B=14 AND
A=4 OR B=13 AND A=3 THEN PRINT
AT 16,6;" " AT 15,5;" " AT 15,5;"
" AT 14,4;" " AT 14,4;" " AT 1
3,3;" " AT 13,3;" "
355 IF B=15 AND A=5 OR B=14 AND
A=4 OR B=13 AND A=3 THEN PRINT
AT B,A-1;" "
356 IF B=15 AND A=5 OR B=14 AND
A=4 OR B=13 AND A=3 THEN STOP
360 PRINT AT 4,6;"POINTS=";P
380 IF B=11 AND A=30 THEN GOTO
890
390 PRINT AT 2,7;"FUEL=";F
400 LET F=F-1
410 IF F=0 THEN PRINT "YOU ARE
BLOWN TO BITS"
420 IF F=1 THEN STOP
430 GOTO 300
450 PRINT AT B+1,A;"*"; AT B+1,A
"
460 PRINT AT B+2,A;"*"; AT B+2,A
"
470 IF B+1=16 AND A=1 THEN LET
F=F+5
471 IF B+2=16 AND A=1 THEN LET
F=F+5
472 IF B+1=16 AND A=5 THEN LET
F=F+5
473 IF B+2=16 AND A=5 THEN LET
F=F+5
474 IF B+1=15 AND A=11 THEN LET
F=F+5
475 IF B+2=15 AND A=11 THEN LET
F=F+5
476 IF B+1=15 AND A=19 THEN LET
F=F+5
477 IF B+2=15 AND A=19 THEN LET
F=F+5
478 IF B+1=15 AND A=25 THEN LET
F=F+5
479 IF B+2=15 AND A=25 THEN LET
F=F+5
480 IF B+1=14 AND A=24 THEN LET
P=P+10
481 IF B+2=14 AND A=24 THEN LET
P=P+10
482 IF B+1=16 AND A=12 THEN LET
```

```
483 IF B+2=16 AND A=12 THEN LET
P=P+10
484 IF B+1=16 AND A=17 THEN LET
P=P+10
485 IF B+2=16 AND A=17 THEN LET
P=P+10
486 IF B+1=15 AND A=22 THEN LET
P=P+10
487 IF B+2=15 AND A=22 THEN LET
P=P+10
488 IF B+1=15 AND A=28 THEN LET
P=P+10
489 IF B+2=15 AND A=28 THEN LET
P=P+10
490 IF B+1=17 AND A=27 THEN LET
P=P+10
491 IF B+2=17 AND A=27 THEN LET
P=P+10
492 IF B+1=14 AND A=29 THEN LET
P=P+10
493 IF B+2=14 AND A=29 THEN LET
P=P+10
494 IF B+1=16 AND A=6 THEN LET
P=P+10
495 IF B+2=16 AND A=6 THEN LET
P=P+10
496 IF B+1=15 AND A=9 THEN LET
P=P+10
497 IF B+2=15 AND A=9 THEN LET
P=P+10
498 IF B+1=15 AND A=15 THEN LET
P=P+10
499 IF B+2=15 AND A=15 THEN LET
P=P+10
500 RETURN
510 REM SCORING SYSTEM AND INST
RUCTIONS
590 CLS
900 PRINT "WELL DONE YOU HAVE C
OMPLETED YOUR MISSION"
1000 PRINT AT 13,5;"POINTS+FUEL=";
P+F
1010 PRINT AT 18,3;"DO YOU WANT
ANOTHER GO Y/N."
1020 INPUT A$
1030 IF A$="Y" THEN GOTO 10
1040 IF A$="N" THEN CLS
1050 LIST
```

# Smooth screen scrolling in machine code

**In part two of his series dealing with m/c Tony Rickwood looks at simple commands**

**I**N THE last issue, I introduced some of the background concepts of machine code programming. We are now ready to make a start on practical machine code by looking at two short routines for scrolling the display to both sides of the screen.

Take a quick look at the two routines listed in this article and you will see how just a few machine code instructions can achieve a smooth scroll, pixel by pixel. First, a few notes about the format which will be used to present all examples in the series. Each program is presented in two parts: a Basic program followed by an Assembler listing. To use a routine, it is not essential for you to understand the assembler or to use an assembler to enter it. All machine code is contained in and entered into memory by the Basic program which will also demonstrate the routine in execution. It will even save the machine code for you to build up

program. Much of what I will have to say in this series will teach you machine code by explaining the assembler instructions. The important thing, though, is to get the routine running first from the Basic program and then to settle down to understand how it works.

## SCROLL RIGHT: BASIC

First, enter and run the Basic listing for Program one. Provided you enter the data correctly, you will see a screen listing of the program disappearing to the right.

```

Program One: Basic
10 REM PROGRAM ONE- RIGHT PIXE
L SCROLL
20 LET s=0: FOR i=64000 TO 640
23: READ n: POKE i,n: LET s=s+n:
NEXT i
30 READ sum: IF s <> sum THEN
PRINT "error in data entry - re
typeline 40": STOP
40 DATA 6,0,197,33,255,63,6,19
2,197,175,6,32,35,203,30,16,251,
193,16,244,193,16,235,201,2795
50 PRINT "data entry o.k." "no
w running m/c": PAUSE 100
60 CLEAR 63999: LIST : RANDOMI
ZE USR 64000: STOP
  
```

Line 10 does most of the work by reading the machine code as decimal numbers and POKEing them into a part of spare memory. 24 bytes of spare memory from locations 64000 to 64023 are used in this case. What do we mean by

set to the byte immediately preceding the part of memory reserved for UDG's. This can be found by:

```
PRINT PEEK 23730 + 256*PEEK
23731
```

which evaluates the system variable called RAMTOP (see page 176 of the manual). On power up, this will be 65367 for a 48K machine and 32599 for a 16K machine.

b) How low can a spare byte be? This will depend mainly on the size of any Basic program and variables, and can be found by:

```
PRINT PEEK 23653 + 256*PEEK
23654
```

which evaluates the system variable called STKEND.

Subtracting high and low bytes gives you the number of spare bytes so you can change the numbers in line 20 to suit your own requirements (and machine i.e. 16 or 48K).

Line 30 checks your data entry in the DATA statement (line 40), as an attempt to execute defective machine code will often



cause the machine to crash. Line 60 executes the routine following a CLEAR command. This lowers RAMTOP to ensure that the routine is not erased when NEW is pressed, or another Basic program is loaded (remember that you will often want to use the same machine code routine with different Basic programs). The LIST is necessary to give you a display to be scrolled when the routine is executed by RANDOMIZE USR 64000.

## SCROLLING RIGHT: ASSEMBLER

This has been prepared using one of the better commercially available assembler programs. To reiterate, you do not have to enter this unless you have an assembler of your own and wish to experiment with different ways of doing the same job (a good way

Program One: Assembler

```

10 ;ASSEMBLER FOR PROGRAM 1- RIGHT PIXEL SCROLL
20 ;
0600 30 LD B,0 ;LOOP THROUGH
C5 40 PIXEL PUSH BC ;256 PIXEL COLUMNS
21FF3F 50 LD HL,16383 ;1 LESS THAN DF START
06C0 60 LD B,192 ;LOOP THROUGH
C5 70 ROW PUSH BC ;192 PIXEL ROWS
AF 80 XOR A ;SET CARRY TO ZERO
0620 90 LD B,32 ;LOOP THROUGH
23 100 COL INC HL ;32 BYTE COLUMNS
CB1E 110 RR (HL) ;ROTATE EACH BYTE
10FB 120 DJNZ COL ;END OF COLUMN LOOP
C1 130 POP BC
10F4 140 DJNZ ROW ;END OF ROW LOOP
C1 150 POP BC
10EB 160 DJNZ PIXEL ;END OF PIXEL LOOP
C9 170 RET ;RETURN TO BASIC
  
```

a dedicated toolkit of routines for you to call from your own Basic programs.

The assembler listing is there to help you understand what is being done by the numbers POKEd into memory by the Basic pro-

gram. Page 165 of your Spectrum manual gives you a complete memory map. The important things to find out are:

a) How high can a spare byte be? When you first switch on, RAMTOP (the top of available RAM) is

to make learning machine code faster and more enjoyable). If you do not like the idea of pre-cooked machine code, and do not own an assembler, you may wish to use a Hex Loader. There are many such utility programs listed in books and magazines which you can key in in Basic. These will accept the hexadecimal equivalents to the Z80 mnemonics as they appear in assembler listings, convert them to decimal numbers, and POKE them into memory. If you wish to use a hex loader then, instead of

register H with the binary form for "63" and register L with that for "255".

Now we can start to understand how this little routine hangs together, but do make sure you properly understand the previous paragraph as it is fundamental to all machine code programming.

Firstly, we must define what the routine has to do. This can be simply stated as "moves the whole screen to the right, pixel by pixel". We can visualise a display as a matrix of dots (black or

works through the 32 bytes in each row. We can break down our analysis by looking at what goes on in the inner loop first and working outwards.

**The COLUMN Loop:** The lines



my Basic interface programs, the hex equivalents are given in my assembler listings (first column).

The second column shows assembler line numbers which I will refer to frequently for explanatory notes. These are followed by the assembler instruction. Anything preceded by a semi-colon is like a Basic REMark. To see the relationship between Assembler, hexadecimal equivalents and the decimal numbers you have entered in the Basic program, have a close look at line 50 : LD HL,16383. The hex equivalent of a Z80 instruction of this form is "21 xx xx" where "xx xx" is the two byte representation of the number to be loaded into register pair HL (which is what the CPU understands by the hex code "21"). In machine code terminology, a number in the range 0 to 65535 has to be split into a "high order" and a "low order" byte (HOB and LOB). HOB is the number of times a number will divide by 256 and LOB is the remainder. Thus:  $HOB = INT(n/256)$  and  $LOB = n - 256 * INT(n/256)$ . The HOB and LOB for 16382 are 63 and 255 respectively (in hex, 3F and FF).

You may recall from a previous article on Numbers that the LOB is stored first, so this convention is also used with machine code instructions. Therefore, the instruction we are examining here becomes "21 FF 3F" in hex. In decimal, this is "33 255 63," as you will find it in the Basic listing. When running, the CPU will automatically interpret the binary representation of "33" (BIN 0100001) as instructing it to load

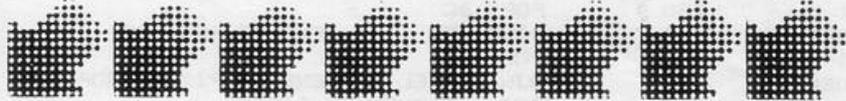
white) which spread 256 wide (32 columns \*B) and 192 deep (24 rows \*8). Next, we must decide how this is to be done. The method I have used is to work through each consecutive byte of the display file, working with each of the 32 bytes (representing 32 columns) across the screen before moving down to the next pixel row. Remember that there



are 192 pixel rows and it is these rows (not the 24 character rows) with which we will be dealing.

The display file which is used to store all 6144 bytes (32\*192) of data which make up the display starts at location 16384 and ends at 22527. Our scroll routine has to change the bit pattern of all these bytes, not just once (as this will only give a single pixel move for the whole screen) but 256 times.

For the Basic programmer, this immediately brings to mind the concept of nested FOR/NEXT loops. There are three such loops



in this routine, labelled PIXEL, ROW and COL (for COLUMN). The outer PIXEL loop serves to repeat for 256 pixel moves (so that the leftmost pixels are the last to disappear). The middle ROW loop works down through 192 rows and the inner COL loop

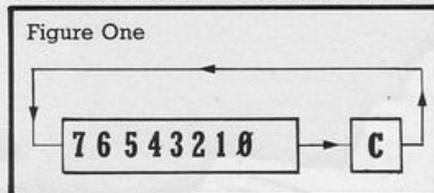
of interest here are numbered 80 to 120. Two are to initialise this loop, starting with XOR A. This stands for "eXclusive OR on register A" and represents one of three commonly found logical operators (OR, AND, XOR). We shall be seeing much more of all three in future examples. For the moment all you need to know is that this instruction has the important property of clearing the carry flag. You will see how the carry flag is used to hold the bit which is forced out of each byte to become the first bit of the next byte. Remember that we are at the start of a pixel row at this point in the routine. To ensure that the last bit of the previous row does not become the first bit of the current row, it is therefore vital to reset the carry flag to zero.

"LD B,32" means "Load Register B with the number 32". I explained the principle of addressing in the previous article. You need to know that there are several types of addressing. The type being used here is called immediate addressing. In plain language, it means that register B can be loaded immediately with a number instead of having to look up a value somewhere in memory. In Basic, an analogy would be let B=32:LET B=A. The command sets up a loop counter similar to that of a FOR B=32 to 1 STEP -1 and covers the 32 bytes

(for each column) in a row. Line 100 is the first instruction to be executed in the inner loop proper. The part which is converted to machine code by the assembler is "INC HL", as "COL" is just a label to mark the start of the loop. "INC HL" is read as

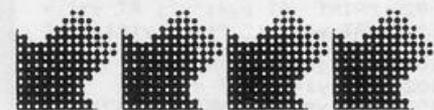
"INCrement the contents of the HL register pair by 1". As we will see, HL is used to point to each consecutive byte of the display file.

The real work in this routine is done by line 110. "RR (HL)" which is read as "Rotate Right the contents of the address pointed to by HL (i.e. the current byte of the display file)". This is an example of an instruction which uses indirect addressing. Here,



the CPU is working indirectly on a memory location to which the HL register pair is pointing. The appearance of brackets in machine code can generally be read in this way. Why do we not use direct addressing by calling in the number to be operated on, doing the operation, and putting it back again? We could, but this would require three instructions. So indirect addressing makes machine code more compact and efficient.

Figure one shows how "RR" works on a byte of data. Used once, it moves bit 7 to bit 6, bit 6 to bit 5 etc, down to bit 0 which is moved to figure 1 occupy the carry flag. What was the carry flag is moved to bit 7. Thus, as we move across the 32 bytes of a pixel row, each byte is moved one pixel to the right, with the carry flag holding the overflow



bit ready to start the next byte.

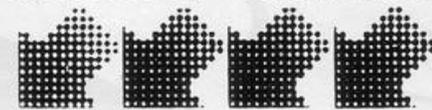
The COLumn loop is terminated by Line 120, "DJNZ COL" which reads as "Decrement the B Register and Jump to label COL if the contents of B are Non Zero". DJNZ must always be used in conjunction with B holding the loop counter and gives us the nearest machine code equivalent of the FOR/NEXT loop. The assembler program automatically works out which instruction has been assigned the label COL and enters an offset (number of steps backward) into the machine code for DJNZ.

**The ROW loop:** This is initialised

by line 50, which points HL to the byte immediately below the start of the display file so that, the first time INC HL is executed, HL is pointing to the start of the display. Line 60 sets up the loop counter for 192 rows.

Now we hit a small snag. As we have seen, all DJNZ loops must use the B register as the loop counter so, for nested loops, we must be able to store an outer loop counter while an inner loop is being processed. We could load B into another register and load it back again, although there are two instructions which are more compact. These are "PUSH BC" and "POP BC".

Look at your Spectrum manual again, and you will see a chunk of memory called the stack. This is a place where numbers can be stacked on top of one another. It



is a convenient place for the machine code programmer to store numbers temporarily, without having to worry about addressing.

To use the stack, a number is PUSHed onto it from a register pair, and POPped off again when required. For example, suppose the CPU is about to start on the 50th row. Line 70 will PUSH the number 50 (along with whatever register C is holding — this is irrelevant in this example) onto the stack. It can then work through the COL loop with B=1

loops, except that here we are executing the single pixel move (for whole screen), 256 times. You need not worry that all the PUSHing and POPping will confuse matters because the CPU auto-

#### Program Two: Assembler

```
10 REM PROGRAM TWO - LEFT PIXE
L SCROLL
20 LET s=0: FOR i=64000 TO 640
23: READ n: POKE i,n: LET s=s+n
: NEXT i
30 READ sum: IF s <> sum THEN
PRINT "ERROR in DATA ENTRY - RE
TYPE LINE 40": STOP
40 DATA 6,0,197,33,0,88,6,192,
197,175,6,32,43,203,22,16,251,19
3,16,244,193,16,235,201,2565
50 PRINT "data entry o.k." "no
w running m/c": PAUSE 100
60 CLEAR 63999: LIST : RANDMI
ZE USR 64000: STOP
```

matically works with the stack on a first in, last out basis.

You might be a bit puzzled by line 30, "LD B,0" for 256 repetitions. Imagine a register as a milometer which can only register up to 255 miles before re-setting to zero. If we set it to zero to start with, then the first time the DJNZ PIXEL instruction is executed, our milometer will be turned back to 255. Therefore, another 255 passes through the outer loop will be required to bring B down to zero and finally allow the CPU to exit back to Basic through the RETURN instruction.

Program 2 lists the routine for a left pixel scroll. As you would expect, the assembler listing is very similar to Program One except that now we are working backward through the display file. Therefore, we need to DECrement HL (from the end of the

#### Program Two: Basic

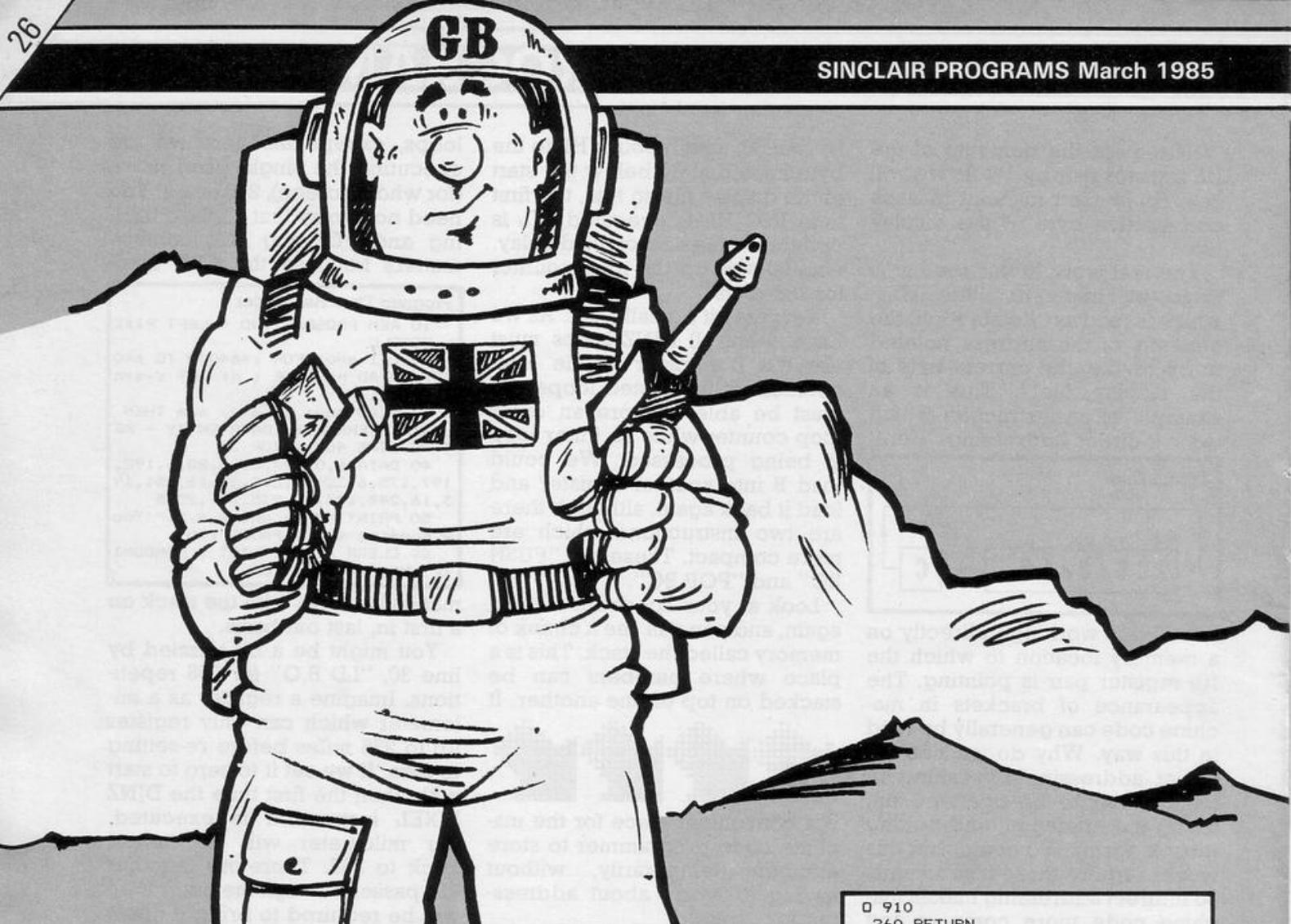
```
10 ;ASSEMBLER FOR PROGRAM 2- LEFT PIXEL SCROLL
20 ;
0600 30 LD B,0
C5 40 PIXEL PUSH BC
210058 50 LD HL,22528 ;1 MORE THAN DF END
06C0 60 LD B,192
C5 70 ROW PUSH BC
AF 80 XOR A
0620 90 LD B,32
2B 100 COL DEC HL
CB16 110 RL (HL)
10FB 120 DJNZ COL
C1 130 POP BC
10F4 140 DJNZ ROW
C1 150 POP BC
10EB 160 DJNZ PIXEL
C9 170 RET
```

TO 32. The B=50 is then POPped back off the stack, and the DJNZ in line 140 decrements it to 49, ready for the next row.

**The PIXEL loop:** starts at line 40 and ends on line 160. The same principles apply as for the inner

display file) and "Rotate Left" (RL) each byte of the display.





# ROCKET MAN

```

1 LET s=0: LET h=0
5 INVERSE 0: BRIGHT 0: PAPER
0: BORDER 0: INK 7: CLS : RESTOR
E : GO TO 6000
10 FOR k=60 TO 40 STEP -4: BEE
P .002,k: BEEP .002,k-10
11 NEXT k: RETURN
20 FOR k=40 TO 60 STEP 4: BEEP
.002,k: BEEP .002,k-10: NEXT k
25 RETURN
100 IF ATTR (y,x)<7 OR ATTR (
y+1,x)<7 THEN LET y=y1: LET x=x
1: GO TO 1071
110 IF ATTR (y,x)=6B OR ATTR
(y+1,x)=6B THEN BEEP .1,55: LET
s=s+25: PRINT #0: AT 1,6- LEN
STR# s;s: GO TO 1061
115 IF ATTR (y,x)>128 OR ATTR
(y+1,x)>128 THEN GO TO 300
120 IF ATTR (y,x)=69 OR ATTR
(y+1,x)=69 THEN PRINT AT y1,x1
;" ": AT y1+1,x1;" ": AT y+1,x;m
$(a+2): BORDER 1: FOR i=1 TO 2:
PRINT AT y,x;"A": GO SUB 20: PR
INT AT y,x;"C": GO SUB 20: NEXT
i: BORDER 0: LET d=d-20: PRINT

```

```

#0: AT 1,28;" " : AT 1,28;d: IF
d=0 THEN GO TO 8700
122 IF p=y AND q=x OR p=y+1 AND
q=x THEN GO TO 910
123 GO TO 900
210 IF x<27 AND a=1 THEN PRINT
INK 6: AT y,x+1;"IIII": GO SUB
10: PRINT AT y,x+1;" "
220 IF x>4 AND a=2 THEN PRINT
INK 6: AT y,x-4;"IIII": GO SUB
10: PRINT AT y,x-4;" "
230 IF ATTR (e,f)=7 THEN GO S
UB 9000: FOR i=e TO 21: PRINT 0
VER 1: INK 8: PAPER 8: BRIGHT 8:
FLASH 8: AT i,f;"E": BEEP .002,
35-i: BEEP .002,40-i: PRINT OVE
R 1: INK 8: PAPER 8: BRIGHT 8: F
LASH 8: AT i,f;"E": NEXT i: GO T
O 900
240 IF ATTR (p,q)=7 THEN GO S
UB 9000: FOR i=p TO 21: PRINT 0
VER 1: INK 8: PAPER 8: BRIGHT 8:
FLASH 8: AT i,q;"G": BEEP .002,
35-i: BEEP .002,40-i: PRINT OVE
R 1: INK 8: PAPER 8: BRIGHT 8: F
LASH 8: AT i,q;"G": NEXT i: GO T

```

```

0 910
260 RETURN
310 IF y=0 THEN LET y=19: GO T
O 4000
320 IF y=20 THEN LET y=1: GO T
O 4000
330 IF x=0 THEN LET x=30: GO T
O 4000
340 IF x=31 THEN LET x=1: GO T
O 4000
900 RANDOMIZE : PRINT AT e,f;"
": LET f=1+ INT ( RND *30): LET
e=1+ INT ( RND *20): PRINT AT
e,f: INK 5: BRIGHT 1;"E": GO TO
911
910 RANDOMIZE : PRINT AT p,q;"
": LET q=1+ INT ( RND *30): LET
p=1+ INT ( RND *20): PRINT AT
p,q: INK 5: BRIGHT 1;"G"
920 PRINT AT y,x;" ": AT y+1,x
;" ": AT y1,x1;" ": AT y1+1,x1;"
"
1000 FOR j=1 TO 4
1020 LET y1=y: LET x1=x
1030 LET y=y+(( INKEY$ ="w")-( I
NKEY$ ="2"))
1040 IF INKEY$ ="0" THEN LET x
=x+1: LET a=1
1041 IF INKEY$ ="9" THEN LET x
=x-1: LET a=2
1060 IF ATTR (y,x) <> 7 OR ATT
R (y+1,x) <> 7 THEN GO TO 100
1070 PRINT AT y1,x1;" ": AT y1+
1,x1;" ": AT y,x;m$(a): AT y+1,x
;m$(a+2)
1090 IF INKEY$ ="m" THEN GO SU
B 200
1110 IF j=2 OR j=4 THEN GO TO 1
142
1120 LET e1=e: LET f1=f
1125 IF RND >.8 THEN LET e=e+(
y<e)-(y>e)): GO TO 1131
1130 LET e=e+((y>e)-(y<e))
1131 LET f=f+2*((x>f)-(x<f))
1135 IF ATTR (e,f) <> 7 THEN L
ET e=e1: LET f=f1
1140 PRINT AT e1,f1;" ": AT e,f
: INK 5: BRIGHT 1;b$(j)
1141 GO TO 1171

```



# SPECIAL

A whole variety of colourful screen effects are gathered within Special fx for the Spectrum computer. When RUN, the computer will demonstrate each in turn.

```

0> REM Special fx
  @1984 Ian Brownridge
  1 BORDER 0: PAPER 0: INK 7: B
  RIGHT 1: CLS
  2 GO TO 9000
  5 LET pitch=40136: LET dur=40
  138: LET sound=40132: LET left=4
  0000: LET right=40051: LET up=40
  090: LET down=40111: LET junk=40
  039: REM Initialise the four att
  ribute scrolls and screen fill
  routines
  10 REM fill screen with junk
  15 LET j=0
  20 RANDOMIZE USR junk
  30 POKE 40044,j: REM move poin
  ter up through the ROM
  40 LET j=j+1
  50 IF j>30 THEN LET j=0: REM
  check to make sure pointer does
  not find group of similar bytes
  thus keeping random effect
  60 IF INKEY$="" THEN GO TO
  20
  65 POKE pitch,15: RANDOMIZE U
  SR sound
  70 POKE 23296,71: REM restore
  paper colour
  80 FOR f=1 TO 16: REM call rou
  tines 16 times to clear screen
  90 RANDOMIZE USR left: RANDOM
  IZE USR right: RANDOMIZE USR u
  p: RANDOMIZE USR down
  100 NEXT f
  110 REM stripes
  115 FOR g=0 TO 5: REM call rout
  ine six times
  120 LET x=0
  130 FOR f=0 TO 16
  140 POKE 23296,x
  150 LET x=x+8
  160 IF x>56 THEN LET x=0
  170 RANDOMIZE USR left: RANDOM
  IZE USR right
  180 NEXT f
  185 NEXT g
  190 PRINT #0; AT 1,0; INK 2; PA
  PER 6; BRIGHT 1; FLASH 1;" PRE
  SS ANY KEY TO CONTINUE ": IF
  INKEY$="" THEN GO TO 190
  200 POKE 23296,71
  205 FOR f=12 TO 2 STEP -1: POKE
  pitch,f: RANDOMIZE USR sound:
  NEXT f
  210 FOR f=0 TO 16
  220 RANDOMIZE USR left: RANDOM
  IZE USR right
  230 NEXT f
  235 FOR f=8 TO 2 STEP -1: POKE
  pitch,f: RANDOMIZE USR sound: N
  EXT f
  240 REM more stripes
  245 FOR g=0 TO 5: REM call rout
  ine six times
  250 LET x=0
  260 FOR f=1 TO 13
  270 POKE 23296,x
  280 LET x=x+8
  290 IF x>56 THEN LET x=0
  300 RANDOMIZE USR up: RANDOMIZ
  E USR down
  310 NEXT f
  320 NEXT g
  330 IF INKEY$="" THEN GO TO
  330
  340 POKE 23296,71
  345 FOR g=1 TO 3: FOR f=6 TO 2
  STEP -1: POKE pitch,f: RANDOMIZE
  USR sound: NEXT f: NEXT g
  350 FOR f=0 TO 13
  360 RANDOMIZE USR up: RANDOMIZ
  E USR down
  370 NEXT f
  380 REM part screen attribute s
  crolls
  390 LET x=79
  395 POKE 23296,x
  400 FOR f=1 TO 16
  410 RANDOMIZE USR up: RANDOMIZ
  E USR left
  420 NEXT f
  425 PAUSE 10: PAUSE 0

```

# EFFETS

The listing is clearly labelled with REM statements which allow for removal of individual routines for use in your own programs.

```

428 FOR f=5 TO 10: FOR g=6 TO 2
STEP -1: POKE pitch,g: POKE dur
,f: RANDOMIZE USR sound: NEXT g
: NEXT f
430 LET x=x+8
440 POKE 23296,x
450 FOR f=0 TO 16
460 RANDOMIZE USR up: RANDOMIZ
E USR right
470 NEXT f
475 PAUSE 0
477 FOR f=1 TO 3: FOR g=6 TO 2
STEP -1: POKE pitch,g: POKE dur,
f: RANDOMIZE USR sound: NEXT g:
NEXT f
480 LET x=x+8
490 POKE 23296,x
500 FOR f=0 TO 16
510 RANDOMIZE USR down: RANDOM
IZE USR left
520 NEXT f
525 PAUSE 0
527 POKE dur,1: POKE pitch,2: F
OR f=1 TO 10: RANDOMIZE USR sou
nd: NEXT f
530 LET x=x+8
540 POKE 23296,x
550 FOR f=0 TO 16
560 RANDOMIZE USR down: RANDOM
IZE USR right
570 NEXT f
575 PAUSE 0
580 POKE pitch,12: POKE dur,30:
RANDOMIZE USR sound
590 REM Flag
600 LET x=0
610 FOR f=0 TO 60
620 LET x=x+8
630 IF x>128 THEN LET x=0
640 POKE 23296,x
650 RANDOMIZE USR up: RANDOMIZ
E USR down: RANDOMIZE USR left
: RANDOMIZE USR right
660 NEXT f
670 FOR f=1 TO 5: RANDOMIZE US
R sound: NEXT f

```

```

680 POKE 23296,71
690 FOR f=0 TO 16
700 RANDOMIZE USR up: RANDOMIZ
E USR down: RANDOMIZE USR left
: RANDOMIZE USR right
710 NEXT f
720 PRINT AT 11,8;"Thats all f
olks !!!"
999 STOP
9000 CLEAR 39999: RESTORE 9100:
FOR a=40000 TO 40146
9005 PRINT AT 11,8;"Poking in m
/c now"
9010 READ b
9020 POKE a,b
9030 NEXT a
9040 LET x=0: FOR f=40000 TO 401
46
9050 LET x=x+ PEEK f
9060 NEXT f
9070 IF x <> 10232 THEN PRINT
INK 2; PAPER 6; BRIGHT 1; FLASH
1; AT 11,9;"ERROR IN DATA": BEEP
2,-10: STOP
9080 CLS
9090 GO TO 5
9100 DATA 33,0,88,58,0,91,14,24,
6,15,35,94,43,115,35,16,249,119,
35,35,35,35,35,35,35,35,35,35,
,35,35,35,35,35,35,13,32,226,201
9110 DATA 17,0,88,33,0,0,1,224,2
,237,176,201
9120 DATA 33,255,90,58,0,91,14,2
4,6,15,43,94,35,115,43,16,249,11
9,43,43,43,43,43,43,43,43,43,
43,43,43,43,43,43,43,13,32,226,2
01
9130 DATA 33,32,88,17,0,88,1,128
,1,237,176,58,0,91,6,32,18,19,16
,252,201
9150 DATA 33,223,90,17,255,90,1,
96,1,237,184,58,0,91,6,32,18,27,
16,252,201
9160 DATA 6,255,33,0,6,17,10,0,4
3,205,181,3,16,250,201

```

30

**You've got it**



**Licked**

**S**olve Jet Set Willy with: POKE 35899,0 which gives you infinite lives; POKE 36477,1 which allows you to fall without dying; POKE 59900,0 which stops the attic bug, POKE 35123,0 which removes all moving objects and POKE 37874,0 which will automatically collect any object in a room.

**Craig Lemon,  
Braintree, Essex**

**F**inish Jet Set Willy more quickly than you ever dreamed of by adding 38 POKE 37925,0 to the loader program. You will then be able to go straight to bed, for Maria will have gone.

**Paul Williams,  
Tamworth, Staffs  
Who put this one here?  
Come on, own up. Ed.**

**A** slick way of disabling the BREAK key on your Spectrum is to enter as your first line: 10 LET W=PEEK 23613-2: POKE 23613,W

The effect of this is sometimes negated by FOR...NEXT loops, GOTOs and GOSUBs so it may have to be repeated within your program.

Also: make your program disappear with POKE 23755, 100 and make it reappear with POKE 23755,0.

**Russell Haydon,  
East London**

**E**ntering PRINT USR 12345 will cause your Spectrum to freeze. It will only start to work again if you switch it on and off again.

**Toby Drysdale,  
Moss, Doncaster**  
Much the same effect can be produced by unplugging your computer. A more permanent effect will be achieved if you persuade a large elephant to jump up and down on your machine (this will work on any type or make of computer). Ed.

### NOTICE TO ALL WRITERS

Infinite lives, freedom from all difficulties, what is happening? Software Projects wanted their game to be difficult, not a short romp through the loader program. No more Jet Set Willy tips will be printed, whether useful, funny or just plain ridiculous.  
By order,  
**THE EDITOR**

**A**chieve infinite lives in your favourite arcade games:

**Tranz Am** POKE 25446,0  
**Kosmic Kanga** POKE 2394

**Jet Set Willy** No, no, no. Ed.

**Eskimo** Eddie POKE 24686,24 and then POKE 24687,76 before line 30  
**Hunchback** POKE 26888,0

**Arcadia** POKE 25776,0  
**Andrew Warwick,  
South Shields**

**C**heck your spare memory with: PRINT 65536-USR 7962; " Bytes left"

Set the computer to CAPS LOCK with POKE 23658,8 and return it to normal with POKE 23658,0. Scroll the whole page up to the top line with LET S=USR 3330, which must be followed by CLS. Scroll whole page one line only with LET S=USR 3582.

All these will work on the 48K Spectrum.

**Andrew Grant,  
Budleigh, Devon.**

**I**n Jet Set Willy, remove the star on the main landing with: 31 POKE 54814,0 and make Willy walk backwards with: 35 POKE 36477,1

**M Jones,  
Wolverhampton.**



**M**ake your programs by finishing them with:  
 RUN automatically  
 9997 STOP  
 9998 SAVE "THE NAME OF YOUR PROGRAM"  
 LINE 1  
 9999 GOTO 1  
 and then entering GOTO 9998 when you want to save your program.

**Blake Gilchrist,**  
 Dulverton, Somerset

**Z**x-81 owners, help your fingers to find the correct keys whilst playing a game by sticking file paper hole strengtheners onto the appropriate keys.

**Michael Chadwick,**  
 Heywood, Lancs

**W**hen writing a program on your ZX-81 you may need most, if not all, of the memory. If you have 32K, to set a higher ramtop enter:  
 POKE 16389,192  
 For the 48K Ram, key in  
 POKE 16388,255  
 POKE 16389,255

**Paul Slaven,**  
 Exeter, Devon

# pen-friends

**Rachel Key,** 4 High View, Feniton, Devon EX14 0EG is 12 years old and would like to correspond with someone who also owns a 48K Spectrum. She enjoys programming her computer to play games, and her favourite game is **Pac-man**. She is not yet able to study computing at school and so wishes to improve her computing by finding a pen-friend.

**Carl Murphy,** 87 Selwyn Street, Kirkdale, Liverpool L4 3TN is eleven years old and owns a 48K Spectrum. His favourite magazine is **Sinclair Program** and he too would like to swap games, ideas and programs.



**Andrew Hutchinson,** 32 Water Royd Avenue, Mirfield, West Yorkshire is 14 years old and owns a 48K Spectrum, joystick and interface. He enjoys arcade games, his favourites being **Atic Atac** and **Pyjamarama**.

**Benjamin Gill,** 2 Beechwood Close, Crays Pond, Goring Heath, Reading, Berkshire is 12 years old and owns a 48K Spectrum. He likes fast-moving games such as **Decathlon**, **Harrier** and **Chequered Flag**.

**Steen Jacobsen,** Tornerosevej 4, 4200 Slagelse, Denmark is 15 years old and owns a ZX-81. He would like to exchange tips, news, advice and programs, and is willing to write in English.

**James Hills,** 10 The Laurels, Gledhow Lane, Leeds 8 is 10 years old and is looking for a pen-pal to help him with his computing and swap ideas and program listings.

**Stephen Davies,** 47 Win-canton Road, Southfields, London SW18 5TZ is 13 years old and owns a 48K Spectrum. He buys **Sinclair Programs** regularly, enjoys programming and games, and now knows a lot about the Spectrum.



The winner of the grand prix will win fame and fortune, the loser will finish with a badly dented car and wounded pride. Through your windscreen you can see the cars you are about to overtake. It is essential to avoid crashes if you wish to score enough points to win. To succeed before your time runs out you must take the chance of driving as fast as possible.

3D Grandprix was written for the 16K ZX-81 by Neil I Cottrell of Brentford, Middlesex.

```

1 PRINT "N.C. PRODUCTION", "YOU
ARE THE SEAT OF A FORMULA ONE
RACING CAR. YOU HAVE A 3D VIEW
OF THE CARS YOU OVER TAKE. IF
THEY HIT YOU, YOU LOSE TIME. YOU
NEED TIME TO WIN BY SCORING
POINTS BEFORE YOUR TIME UP. THE
FASTER YOU DRIVE THE MORE YOU
SCORE AND THE LESS TIME YOU USE."

```

```

2 PRINT "SCORE IS ON TOP OF
T RACK, TIME IS ON BOTTOM.", "
CONTROLS... " "8=RIGHT" "5=LEFT"
"0=DECREASE SPEED" "9=INCREASE
SPEED"

```

```

3 PRINT "PRESS ANY KEY.", "
HAPPY CRASHING."

```

```

4 IF INKEY$="" THEN GOTO 4
5 CLS
10 LET HS=0
20 LET S=0
25 LET T=300
35 LET D=10
40 CLS

```

```

45 PRINT AT 3,14;S;AT 21,15;T;
AT 4,16;" ";TAB 15;" ";TAB 14;
" ";TAB 13;" ";TAB 12;
" ";TAB 20;" ";TAB 11;" ";TAB 2
0;" ";TAB 11;" ";TAB 21;" ";TAB
10;" ";TAB 22;" ";TAB 10;" ";TA
B 22;" ";TAB 9;" ";TAB 23;" ";TA
B 9;" ";TAB 23;" ";TAB 8;" ";TAB
24;" ";TAB 8;" ";TAB 24;" ";TAB
7;" ";TAB 24;" ";TAB 7;" ";TA
B 25;" ";TAB 7;" ";TAB 25;" "

```

```

46 IF S>500 THEN GOTO 3000
47 IF T<=0 THEN GOTO 1900
50 PRINT AT 5,16;" "
55 GOSUB 200
60 LET A=1
70 LET Z=INT (RND*2)+1
80 LET X=0

```

```

100 IF Z=1 THEN PRINT AT 8,15;"
"

```

```

110 IF Z=2 THEN PRINT AT 8,17;"
"

```

```

120 IF INKEY$="5" THEN GOSUB 20
0

```

```

130 IF INKEY$="8" THEN GOSUB 30
0

```

```

150 LET X=X+1
155 LET Z=Z+(RND)>.8 AND Z<2)-(R
ND<.2 AND Z>1)

```

```

156 FOR N=1 TO D
157 NEXT N

```

```

158 LET D=D+(INKEY$="0" AND D<2
0)-(INKEY$="9" AND D>1)

```

```

159 LET T=T-D/2
160 IF X=3 THEN GOTO 1200
170 IF X=2 THEN GOTO 1100
180 IF X=1 THEN GOTO 1000

```

```

190 IF X=4 THEN GOTO 1300
195 GOTO 120
200 LET A=1
210 PRINT AT 17,12;" " " " "
2;" " " " " " " " " " " " "
";TAB 12;" " " " " " " " "
";TAB 17;" " " " " " " " "
"

```

```

220 RETURN
300 LET A=2
310 PRINT AT 17,17;" " " " "
7;" " " " " " " " " " " " "
";TAB 17;" " " " " " " " "
";TAB 12;" " " " " " " " "
"

```

```

320 RETURN
1000 IF Z=1 THEN PRINT AT 10,14;
" "
1010 IF Z=2 THEN PRINT AT 10,17;
" "
1020 GOTO 120
1100 IF Z=1 THEN PRINT AT 12,13;
" "
1110 IF Z=2 THEN PRINT AT 12,17;
" "
1120 GOTO 120

```

```

1200 IF Z=1 THEN PRINT AT 14,13;
" " " " " " " " " " " " "
";TAB 13;" " " " " " " " "
1210 IF Z=2 THEN PRINT AT 14,17;
" " " " " " " " " " " " "
";TAB 17;" " " " " " " " "
1220 GOTO 120

```

```

1300 IF Z=1 THEN PRINT AT 17,12;
" " " " " " " " " " " " "
";TAB 12;" " " " " " " " "
";TAB 12;" " " " " " " " "
"
1310 IF Z=2 THEN PRINT AT 17,17;
" " " " " " " " " " " " "
";TAB 17;" " " " " " " " "
";TAB 17;" " " " " " " " "
"

```

```

1320 IF Z=A THEN GOTO 1400
1330 LET S=S+21-D
1350 LET D=D-(D>1)
1360 GOTO 40
1400 FOR N=1 TO 5
1500 PAUSE 2
1600 NEXT N
1700 LET T=T-10
1800 GOTO 40
1900 PRINT AT 12,13;"GAME";TAB 1
3;"OVER"

```

```

2000 IF HS>S THEN GOTO 2200
2010 PRINT AT 21,0;"INPUT NAME"
2100 INPUT E$
2150 LET HS=S
2200 PRINT AT 0,0;"HIGHEST SCORE
=";HS;" BY ";E$
2300 PAUSE 4E4
2500 CLS
2600 GOTO 20
3000 PRINT AT 15,13;"YOU WON"
3050 LET S=S+T
3100 GOTO 2000
9000 SAVE "3D GRANDPRIX"
9990 RUN

```

# SPROGS

THE SPROGS ARE TAKING THEIR ASTRONAUT FRIEND TO LUNCH-



SUDDENLY... HE'S BEEN GIVEN NATOF



THE SPROGS ARE TAKING THEIR FRIEND TO LAUNCH



THE SPROGS TAKE OFF..



AND CAREER THROUGH SPACE



THERE IT IS

STOP HERE



I PROCLAIM YOU THE WINNERS OF THE GREAT SPACE RACE!!



THE SPROGS RETURN TO THEIR SHIP..



# DESPERATE DESCENT

At the bottom of the screen sits Daphnia, trapped in the caves. Above her are caverns swarming with pitiless monsters. Can you venture into the depths to save Daphnia, or will you die in the attempt? Desperate Descent was written for the Spectrum by D Spinks of Hyde, Cheshire.

```

20 PRINT INK 2; AT 10,0;"Do y
ou require instructions y/n?"
30 INPUT b$
40 IF b$="y" THEN GO SUB 1620

50 GO SUB 1470
60 DIM x(40): DIM y(40)
70 LET rand=6: LET total=0: LE
T monsters=10: LET damsel=0: LET
col=0: BORDER 0: PAPER 0: CLS

80 REM create random cavern
90 FOR q=1 TO 20: STEP 2
100 FOR w=0 TO 27
110 LET e=INT (RND *32)
120 IF ATTR (q,e)=4 THEN GO T
O 110
130 PRINT INK 4; AT q,e: CHR$
145
140 NEXT w: NEXT q
150 LET rand=rand-1: LET m=0: L
ET n=0: LET lives=1: LET w=31: L
ET total=total+1: LET monsters=m
onsters+10: LET col=col+1: LET d
ynamite=2
160 PRINT INK 2; AT 21,0;"Dams
els rescued ";damsel
170 REM print man and damsel
180 PRINT INK 5; AT m,n: CHR$
144: PRINT INK 6; AT 20,w: CHR$
147
190 REM create monsters
200 FOR l=1 TO monsters
210 LET x(1)=1+INT (RND *19):
LET y(1)=INT (RND *32)
220 IF ATTR (x(1),y(1))=56+col
THEN GO TO 210
230 PRINT INK col; AT x(1),y(1
): CHR$ 146
240 NEXT l
250 REM create random movement
of monster,create movement of da
msel and check key for movement
of man
260 LET a=1+INT (RND *monster
s): LET b=1+INT (RND *4)
270 LET v=1+INT (RND *rand)

280 IF v=3 AND damsel<total THE
N GO SUB 1400
290 IF b=1 AND y(a)-1 >= 0 THEN
GO SUB 620
300 IF b=2 AND y(a)+1 <= 31 THE
N GO SUB 700
310 IF b=3 AND x(a)-1 >= 1 THEN
GO SUB 780
320 IF b=4 AND x(a)+1 <= 19 THE
N GO SUB 860
330 IF INKEY$="z" AND n-1 >=
0 THEN GO SUB 950
340 IF INKEY$="x" AND n+1 <=
31 THEN GO SUB 1030
350 IF INKEY$="k" AND m-1 >=
0 THEN GO SUB 1110
360 IF INKEY$="m" AND m+1 <=
20 THEN GO SUB 1180
370 IF INKEY$="j" THEN LET p
=m-1: GO SUB 1320
380 IF INKEY$="n" THEN LET p

```

```

=m+1: GO SUB 1320
390 IF lives=0 THEN GO TO 420

400 IF total=damsel AND m=0 THE
N GO TO 460
410 GO TO 260
420 PAPER 6: CLS
430 PRINT INK 2; AT 10,3;"Hard
luck"
440 IF w=0 THEN PRINT INK 1;
AT 12,3;"You were unable to reac
h the": PRINT INK 1; AT 13,3;"d
amsel in time"
450 GO TO 570
460 IF damsel=3 THEN GO TO 530

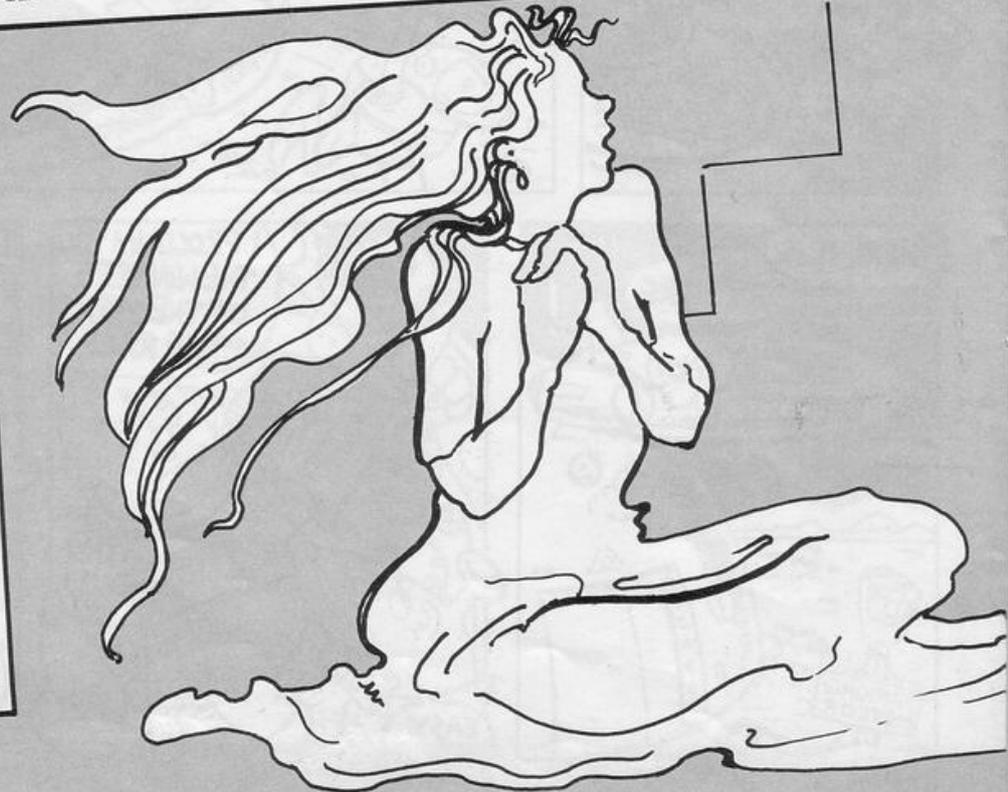
470 REM clear monsters
480 FOR l=1 TO monsters
490 PRINT AT x(l),y(l);" "
500 NEXT l
510 PRINT AT m,n;" "
520 GO TO 150
530 PAPER 6: CLS
540 PRINT INK 2; AT 10,3;"well
done you saved all three"
550 PRINT INK 2; AT 12,3;"dams
els"
560 FOR l=1 TO 5: BEEP .3,20: B
570 PRINT INK 1; AT 15,3;"Anot
her go y/n?"
580 IF INKEY$="" THEN GO TO
580
590 IF INKEY$="y" THEN GO TO
70
600 STOP
610 REM movement of monsters
620 IF ATTR (x(a),y(a)-1)=5 TH

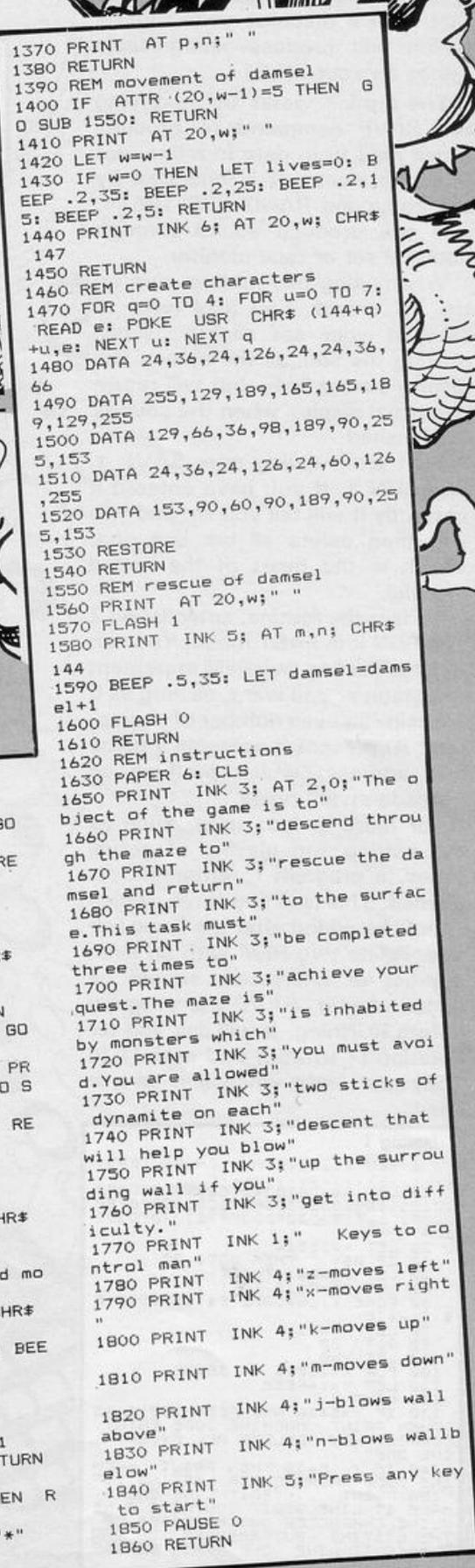
```

```

EN PRINT AT x(a),y(a);" ": GO
SUB 1270: RETURN
630 IF ATTR (x(a),y(a)-1)=4 TH
EN RETURN
640 IF ATTR (x(a),y(a)-1)=col
THEN RETURN
650 PRINT AT x(a),y(a);" "
660 LET y(a)=y(a)-1
670 BEEP .005,60
680 PRINT INK col; AT x(a),y(a
): CHR$ 146
690 RETURN
700 IF ATTR (x(a),y(a)+1)=5 TH
EN PRINT AT x(a),y(a);" ": GO
SUB 1270: RETURN
710 IF ATTR (x(a),y(a)+1)=4 TH
EN RETURN
720 IF ATTR (x(a),y(a)+1)=col
THEN RETURN
730 PRINT AT x(a),y(a);" "
740 LET y(a)=y(a)+1
750 BEEP .005,60
760 PRINT INK col; AT x(a),y(a
): CHR$ 146
770 RETURN
780 IF ATTR (x(a)-1,y(a))=5 TH
EN PRINT AT x(a),y(a);" ": GO
SUB 1270: RETURN
790 IF ATTR (x(a)-1,y(a))=4 TH
EN RETURN
800 IF ATTR (x(a)-1,y(a))=col
THEN RETURN
810 PRINT AT x(a),y(a);" "
820 LET x(a)=x(a)-1
830 BEEP .005,60
840 PRINT INK col; AT x(a),y(a
): CHR$ 146

```





```

850 RETURN
860 IF ATTR (x(a)+1,y(a))=5 TH
EN PRINT AT x(a),y(a); " ": GO
SUB 1270: RETURN
870 IF ATTR (x(a)+1,y(a))=4 TH
EN RETURN
880 IF ATTR (x(a)+1,y(a))=col
THEN RETURN
890 PRINT AT x(a),y(a); " "
900 LET x(a)=x(a)+1
910 BEEP .005,60
920 PRINT INK col; AT x(a),y(a)
); CHR# 146
930 RETURN
940 REM movement of man
950 IF ATTR (m,n-1)=col THEN
PRINT AT m,n; " ": LET n=n-1: GO
SUB 1270: RETURN
960 IF ATTR (m,n-1)=6 THEN PR
INT AT m,n; " ": LET n=n-1: GO S
UB 1550: RETURN
970 IF ATTR (m,n-1)=4 THEN RE
TURN
980 PRINT AT m,n; " "
990 LET n=n-1
1000 BEEP .005,5
1010 PRINT INK 5; AT m,n; CHR#
144
1020 RETURN
1030 IF ATTR (m,n+1)=col THEN
PRINT AT m,n; " ": LET n=n+1: GO
SUB 1270: RETURN
1040 IF ATTR (m,n+1)=6 THEN PR
INT AT m,n; " ": LET n=n+1: GO S
UB 1550: RETURN
1050 IF ATTR (m,n+1)=4 THEN RE
TURN
1060 PRINT AT m,n; " "
1070 LET n=n+1
1080 BEEP .005,5
1090 PRINT INK 5; AT m,n; CHR#
144

```

```

1100 RETURN
1110 IF ATTR (m-1,n)=col THEN
PRINT AT m,n; " ": LET m=m-1: GO
SUB 1270: RETURN
1120 IF ATTR (m-1,n)=4 THEN RE
TURN
1130 PRINT AT m,n; " "
1140 LET m=m-1
1150 BEEP .005,5
1160 PRINT INK 5; AT m,n; CHR#
144
1170 RETURN
1180 IF ATTR (m+1,n)=col THEN
PRINT AT m,n; " ": LET m=m+1: GO
SUB 1270: RETURN
1190 IF ATTR (m+1,n)=6 THEN PR
INT AT m,n; " ": LET m=m+1: GO S
UB 1550: RETURN
1200 IF ATTR (m+1,n)=4 THEN RE
TURN
1210 PRINT AT m,n; " "
1220 LET m=m+1
1230 BEEP .005,5
1240 PRINT INK 5; AT m,n; CHR#
144
1250 RETURN
1260 REM collision of man and mo
nster
1270 PRINT INK 5; AT m,n; CHR#
148
1280 FOR o=10 TO 60 STEP 10: BEE
P .5,o: NEXT o
1290 LET lives=0
1300 RETURN
1310 REM explosion of wall
1320 LET dynamite=dynamite-1
1330 IF dynamite<0 THEN RETURN
1340 IF ATTR (p,n) <> 4 THEN R
ETURN
1350 PRINT INK 2; AT p,n; "*"
1360 BEEP 1,55

```

```

1370 PRINT AT p,n; " "
1380 RETURN
1390 REM movement of damsel
1400 IF ATTR (20,w-1)=5 THEN G
O SUB 1550: RETURN
1410 PRINT AT 20,w; " "
1420 LET w=w-1
1430 IF w=0 THEN LET lives=0: B
EEP .2,35: BEEP .2,25: BEEP .2,1
5: BEEP .2,5: RETURN
1440 PRINT INK 6; AT 20,w; CHR#
147
1450 RETURN
1460 REM create characters
1470 FOR q=0 TO 4: FOR u=0 TO 7:
READ e: POKE USR CHR# (144+q)
+u,e: NEXT u: NEXT q
1480 DATA 24,36,24,126,24,24,36,
66
1490 DATA 255,129,189,165,165,18
9,129,255
1500 DATA 129,66,36,98,189,90,25
5,153
1510 DATA 24,36,24,126,24,60,126
,255
1520 DATA 153,90,60,90,189,90,25
5,153
1530 RESTORE
1540 RETURN
1550 REM rescue of damsel
1560 PRINT AT 20,w; " "
1570 FLASH 1
1580 PRINT INK 5; AT m,n; CHR#
144
1590 BEEP .5,35: LET damsel=dams
el+1
1600 FLASH 0
1610 RETURN
1620 REM instructions
1630 PAPER 6: CLS
1650 PRINT INK 3; AT 2,0;"The o
bject of the game is to"
1660 PRINT INK 3;"descend throu
gh the maze to"
1670 PRINT INK 3;"rescue the da
msel and return"
1680 PRINT INK 3;"to the surfac
e.This task must"
1690 PRINT INK 3;"be completed
three times to"
1700 PRINT INK 3;"achieve your
quest.The maze is"
1710 PRINT INK 3;"is inhabited
by monsters which"
1720 PRINT INK 3;"you must avoi
d.You are allowed"
1730 PRINT INK 3;"two sticks of
dynamite on each"
1740 PRINT INK 3;"descent that
will help you blow"
1750 PRINT INK 3;"up the surrou
ding wall if you"
1760 PRINT INK 3;"get into diff
iculty."
1770 PRINT INK 1; " Keys to co
ntrol man"
1780 PRINT INK 4;"z-moves left"
1790 PRINT INK 4;"x-moves right"
"
1800 PRINT INK 4;"k-moves up"
"
1810 PRINT INK 4;"m-moves down"
"
1820 PRINT INK 4;"j-blows wall
above"
1830 PRINT INK 4;"n-blows wallb
elow"
1840 PRINT INK 5;"Press any key
to start"
1850 PAUSE 0
1860 RETURN

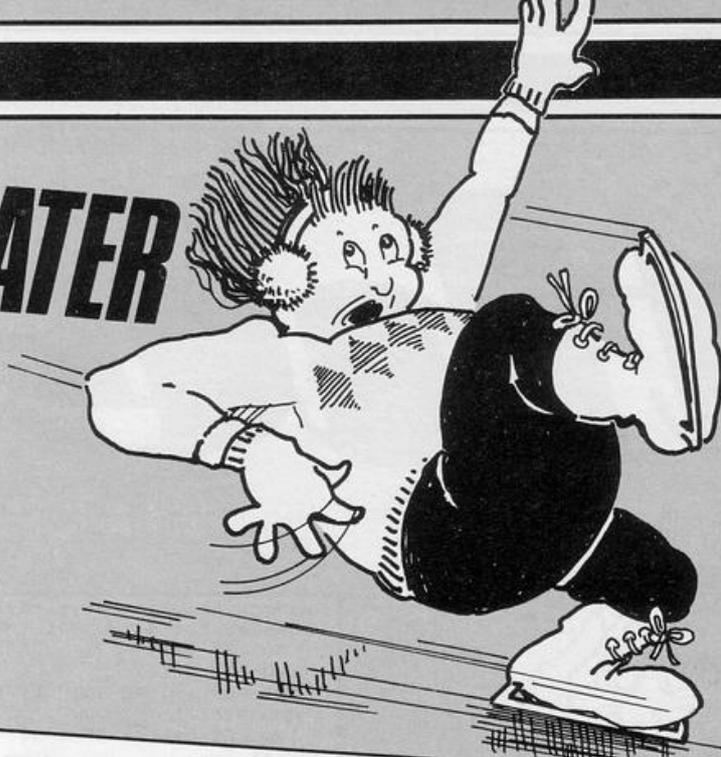
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# INDY THE SKATER

Round and round the pond goes Indy the Skater, moving faster and faster. Then, just as this game begins, the temperature drops and much of the ice on the pond becomes lethal black ice. Control Indy with keys five and eight to keep her circling the pond and save her from hitting the black ice.

Written for the 16K ZX-81 by Wayne Pope and Michael Walters of Faversham, Kent.



```

5 REM INDY
6 LET S=0
7 GOTO 1000
10 LET A=520
15 LET B=-1
20 LET P=PEEK 16396+PEEK 16397
*255+1
30 PRINT "

```



```
40 PRINT "
```

```

200 POKE P+A,0
205 LET C=B
210 LET D#=INKEY#
215 IF D#="8" THEN GOTO 270
220 IF D#("<")"5" THEN GOTO 310
225 IF B=-32 THEN LET B=-33
230 IF B=1 THEN LET B=-32
235 IF B=34 THEN LET B=1
240 IF B=33 THEN LET B=34
245 IF B=32 THEN LET B=33
250 IF B=-1 THEN LET B=32
255 IF B=-34 THEN LET B=-1
260 IF B=-33 AND C=-33 THEN LET
B=-34
265 GOTO 310
270 IF B=-34 THEN LET B=-33
275 IF B=-1 THEN LET B=-34
280 IF B=32 THEN LET B=-1
285 IF B=33 THEN LET B=32
290 IF B=34 THEN LET B=33
295 IF B=1 THEN LET B=34
300 IF B=-32 THEN LET B=1
305 IF B=-33 AND C=-33 THEN LET
B=-32
310 LET A=A+B
315 IF PEEK (P+A)("<>") THEN GOTO
350
320 POKE P+A,52

```

```

321 LET S=S+1
325 GOTO 200
350 GOTO 1360
1000 PRINT TAB 9;"INDY"
1001 PRINT TAB 9;"INDY"
1002 PRINT TAB 9;"INDY"
1003 PRINT TAB 9;"INDY"
1010 PRINT AT 5,15;"BY";AT 7,11;
"WAYNE POPE";AT 9,14;"AND ";AT
11,9;"MICHAEL WALTERS";AT 16,6;"
PRESS ""C"" TO CONTINUE"
1020 IF INKEY#("<")"C" THEN GOTO-10
20
1030 CLS
1060 PRINT AT 1,13;"KEYS";AT 2,1
3;"-----";AT 4,8;"5<LEFT RIGHT>8
1070 PRINT AT 8,9;"PLAYER SELECT
";AT 9,9;"-----"
1080 PRINT AT 11,11;"1 PLAYER";A
T 13,11;"2 PLAYERS"
1085 LET A#=INKEY#
1090 IF A#="1" OR A#="2" THEN GO
TO 1100
1095 GOTO 1085
1100 IF A#="1" THEN LET Z=1
1105 IF A#="2" THEN LET Z=2
1110 PRINT AT 9+(Z*2),11;CHR# (Z
+156)
1115 FOR X=1 TO 50
1120 NEXT X
1125 CLS
1130 DIM X(Z)
1135 FOR N=1 TO Z
1140 PRINT AT 12,12;"PLAYER ";N
1145 FOR M=1 TO 50
1150 NEXT M
1155 CLS
1165 GOTO 10
1360 FOR F=0 TO 21
1365 SCROLL
1370 PRINT "*****"
1375 NEXT F
1380 FOR G=1 TO 20
1385 PRINT AT 11,13;"CRASH"
1390 PRINT AT 11,13;"CRASH"
1395 NEXT G
1400 PRINT AT 15,9;"YOUR SCORE W
AS ";S
1405 PRINT AT 17,10;"PRESS A KEY"
1410 PAUSE 4E4
1420 CLS
1425 LET S=0
1430 NEXT N
1480 CLS
1490 GOTO 1000

```

# the Po



```

mshugeyklmbqjoahfeyitbylialwiug
rnhpseeitacoai"
  80 LET y$=""
  90 DIM s(16)
  100 FOR i=1 TO 16: LET k= INT (
RND *16)+1
  120 LET k=k+1: IF k=17 THEN LE
T k=1
  130 IF s(k)=1 THEN GO TO 120

  140 LET y$=y$+z$(6*(k-1)+ INT (
RND *6)+1)
  150 LET s(k)=1
  160 NEXT i
  230 PRINT AT 18,0: INVERSE 1:
INK 3: BRIGHT 1:" Do you want in
structions?(y/n) "
  240 IF INKEY$ ="n" OR INKEY$
="N" THEN BEEP .1,10: BEEP .1,1
3: CLS : BORDER 6: GO TO 1e3
  250 IF INKEY$ ="y" OR INKEY$
="Y" THEN CLS : BEEP .1,10: BEE
P .1,13: BORDER 7: GO TO 2e3
  260 GO TO 240
  300 INK 2: PAPER 6: BORDER 6: C
LS : FOR f=1 TO 3: FOR i=1 TO 7:
PRINT AT 2,10: INK i:"The Puzz
ler": NEXT i: NEXT f: PRINT AT
2,11: INK 2:"The Puzzler"
  305 INK 0: PLOT 80,127: DRAW 10
,10: DRAW 88,0: DRAW -10,-10: DR
AW 10,10: DRAW 0,-87: DRAW -10,-
10
  400 INVERSE 1: INK 1: PAPER 7

  410 PRINT AT 6,10;"
"
  420 FOR i=7 TO 16
  430 PRINT AT i,10;" "; AT i,20
;" "
  440 NEXT i
  450 PRINT AT 16,10;"
"
  460 INVERSE 0
  500 LET m=93: LET n=54
  510 FOR i=m TO m+48 STEP 16
  520 FOR j=n TO n+48 STEP 16
  530 LET y=j: LET x=i
  540 PLOT x,y: DRAW 0,12: BEEP .
0016,50
  550 LET y=y-1: LET x=x+1
  560 FOR k=1 TO 12: PLOT x,y: DR
AW 0,14: LET x=x+1: NEXT k
  590 LET y=y+1
  600 PLOT x,y: DRAW 0,12
  610 NEXT j
  620 NEXT i
  625 LET l=USR bleep
  630 RETURN
  700 REM letter selection
  701 LET w$=y$
  740 RANDOMIZE : FOR i=12 TO 18
STEP 2: FOR j=8 TO 14 STEP 2: PR
INT AT j,i:w$(INT (RND *16)+1
): NEXT j: NEXT i
  770 RETURN
  1000 PRINT AT 18,0;"
": GO SUB 3
e2
1010 GO SUB 7e2
1020 POKE 23672,0
    
```

```

10 REM Puzzler by Chris Hall
20 REM 48K ZX Spectrum
25 REM For SINCLAIR PROGRAMS

30 PAPER 6: BORDER 6: INK 2: C
LS
31 CLEAR 63999
32 LET hi=0
33 LET n$="ZX SPECCY"
34 POKE 23609,7
35 GO SUB 9e3
40 PRINT AT 1,8: INVERSE 1:"S
inclair Programs": AT 1,6: INVER
SE 0: INK 3:"CD": AT 1,25: INK 3
;"D"
45 PRINT AT 3,12:"present"
50 RANDOMIZE USR 60059
53 PRINT AT 6,4:
55 RESTORE 60: READ a$: FOR f=
1 TO LEN a$: PRINT a$(f): BEEP
.004,f*2
56 NEXT f
60 DATA "The Puzzler by Chris
Hall"
65 PRINT #0;" Press any key
to continue "
66 PAUSE 0: BEEP .1,10: BEEP .
1,13: CLS
69 BORDER 6
70 LET z$="vgtniexfbriopelusta
cesrlezavndpecadmntdkouenosdwora
    
```

```

1030 POKE 23673,0
1040 LET min=0: LET sec=0
1050 LET tim=0
1060 IF tim+50>( PEEK 23672+256*
PEEK 23673) THEN GO TO 1060
1070 LET sec=sec+1: IF sec=60 TH
EN LET sec=0: LET min=min+1
1080 LET tim=tim+50
1090 LET s$="Time = "+ STR$ min+
": "
1100 IF sec<10 THEN LET s$=s$+"
0"
1110 LET s$=s$+ STR$ sec: BEEP .
001,55
1120 PRINT AT 20,1;s$
1140 IF min<3 THEN GO TO 1060
1150 PRINT AT 20,18: FLASH 1: I
NK 2: BRIGHT 1:"Time Up!": FLASH
0: FOR f=1 TO 3: RANDOMIZE USR
60035: RANDMMIZE USR 60083: NE
XT f
1151 RANDOMIZE USR 60059
1155 LET l=USR bleep
1160 PAUSE 2e2
1190 PRINT AT 6,1:"Letters": AT
6,24:"Points"
1200 PRINT AT 8,1:"3 or 4": AT
8,26;"1": AT 10,3;"5": AT 10,26:
"2": AT 12,3;"6": AT 12,26;"3":
AT 14,3;"7": AT 14,26;"5": AT 16
,0;"8 or more": AT 16,26;"10"
1240 FOR l=1 TO 3
    
```



# Puzzler

```

1250 RESTORE 1260: FOR f=1 TO 8:
  READ t,n: BEEP t,n: NEXT f: PAU
SE 40:
1260 DATA .1,11,.1,11,.8,16,.05,
11,.05,16,.05,11,.05,16,1,20
1270 NEXT 1
1271 POKE 23617,236: INPUT "What
was the top score ";thi
1272 IF thi>hi THEN LET hi=thi:
GO TO 1278
1273 IF thi<hi THEN GO TO 1279

1274 IF thi=hi THEN GO TO 1279

1278 POKE 23617,236: INPUT "By w
hom ";n#: IF LEN n#>20 THEN GO
TO 1278
1279 BORDER 6: PAPER 6: INK 3: C
LS: PRINT AT 0,0: INVERSE 1: B
RIGHT 1:"Today's highest score i
s ";hi: INVERSE 1: BRIGHT 1:"b
y": FLASH 0: BRIGHT 0:" ": FLASH
1: BRIGHT 1;n#: FLASH 0: BRIGHT
0:" ": RANDOMIZE USR bleep: PA
USE 0
1280 FOR f=1 TO 6: RANDOMIZE US
R 60083: NEXT f: FOR f=1 TO 5: R
ANDOMIZE USR 60035: NEXT f: RAN
DOMIZE USR 60059: RANDOMIZE US
R 60059
1289 BORDER 5: PAPER 5: INK 1: C
LS
1290 PRINT "Press a key to run t
he program again": PAUSE 0: BEE
P .1,10: BEEP .1,13
1999 BORDER 6: PAPER 6: CLS: GO
TO 69
2000 BORDER 5: PAPER 5: INK 1: C
LS
2001 PRINT AT 2,0:
2010 RESTORE 2020: READ a#: FOR
f=1 TO LEN a#: PRINT a#(f): BE
EP .0009,30: BEEP .0008,40
2011 IF f/32= INT (f/32) THEN F
OR e=1 TO 4: BEEP .01,30: NEXT e

2012 NEXT f
2020 DATA "THE PUZZLER is a game
for 2 to 6 players of any age.
The object is to list as many wo
rds as possible within three
minutes...Each player should ha
ve a pen and paper to note his
or her words,and there shoul
d be no peeping at another pl
ayer's words!!!The 3 minutes
starts as soon as the clock at
the foot ofthe screen starts.Wor
ds are got by the use of adjoin
ing letters.They may be joined an
y way including diagonally!"
2021 PRINT ""PRESS ANY KEY..."
2022 BEEP .002, INT ( RND *50)

2023 IF INKEY#="" THEN GO TO
2022
2024 BEEP .1,10: BEEP .1,13: CLS
2025 BORDER 7
2190 LET w#=#: LET y#="achionea

```



```

klmstsal"
2230 GO SUB 3e2: GO SUB 7e2
2231 PRINT AT 19,0: INVERSE 1:
INK 3: BRIGHT 1:"This is what a
typical screen looks like..."

2240 PRINT "PRESS ANY KEY...": P
AUSE 0
2241 BEEP .1,10: BEEP .1,13: CLS

2420 PRINT "Proper names,abbrevi
ations and hyphonised words are
n't allowed.Check that all words
are spelt curektly!If two or m
ore players have the same word,t
his should be crossed off their
list.The score should be calc
ulated from the remaining words."
2540 PRINT AT 12,2:"Press a key
to start a game...": PAUSE 0: B
EEP .1,10: BEEP .1,13
2560 LET y#=#: CLS: GO TO 1e3

8999 STOP
9000 CLS
9001 REM mc+udgs
9005 RESTORE 9010: FOR f=60000 T
O 60106: READ mc: POKE f,mc: NEX
T f
9010 DATA 1,10,7,33,255,0,17,10,
0,29,213,197,205,181,3,193,209,2

```



```

25,125,145,111,16,242,251,201
9011 DATA 33,100,1,17,1,0,205,18
1,3,201
9012 DATA 1,30,3,33,255,0,17,100
,0,229,213,197,205,181,3,193,209
,225,125,145,111,16,242,201
9013 DATA 1,10,100,33,255,0,17,7
0,0,229,213,197,205,181,3,193,20
9,225,125,145,111,16,242,201
9014 DATA 1,10,75,33,255,11,17,1
,0,229,213,197,205,181,3,193,209
,225,125,12,111,16,242,201
9019 RESTORE 9050
9020 FOR f= USR "C" TO USR "D"+
7
9030 READ usr: POKE f,usr: NEXT
f
9070 DATA 24,56,127,255,127,56,2
4,0,0,0,255,255,255,0,0,0
9100 RESTORE 9200: FOR f=42340 T
O 42360: READ mc: POKE f,mc: NEX
T f
9200 DATA 33,24,1,17,10,0,6,255,
229,213,197,205,181,3,193,209,22
5,43,16,244,201
9210 LET bleep=42340
9220 LET fadecls=32000
9230 RESTORE 9240: FOR f=32000 T
O 32037: READ data: POKE f,data:
NEXT f
9240 DATA 243,6,25,197,33,0,64,2
2,0,62,236,6,25,35,94,245,123,21
1,254,241,43,115,35,16,244,114,3
5,61,32,237,193,16,226,205,107,1
3,251,201
9997 RETURN
9998 STOP
9999 SAVE "Puzzler48K" LINE 1

```



**T**he Puzzler, written for the 48K Spectrum by Chris Hall of Belfast, Northern Ireland, is an extremely well-presented Basic program including some machine-code routines.

A square of 16 letters is displayed on screen. Combine adjoining letters to form as many words as possible, while three minutes tick by on the on-screen clock. Play by yourself, or with friends. Top score in the Sinclair Programs office was a paltry five!

# HELLS CAVERNS



```

10 REM "VOYAGER"
10 PRINT AT 10,9;"INSTRUCTIONS (Y/N)"
20 IF INKEY$="" THEN GOTO 20
20 IF INKEY$="Y" THEN GOSUB 90
30 LET HI=0
40 FOR I=0 TO 100
50 POKER 16418,2
60 PRINT AT 1,0;"**"
70 GOTO 20
80 REM "HELLS CAVERNS"
90 POKER 16418,2
100 FOR F=0 TO INT (RAND*100)+(5
110 PRINT AT 21,0;"**"
120 PRINT AT 0,A-1;"**"
130 LET P=PEEK (PEEK 16398+256+
140 PRINT AT 1,A;"U"
150 IF P=128 OR P=129 OR P=130 OR
160 THEN GOTO 3000
170 SCROLL
180 LET A=A+(INKEY$="8" AND A<3
190 (INKEY$="5" AND A>1)
200 LET S=S+INT (RAND*2)+1
210 NEXT F
220 POKER 16418,2
230 PRINT AT 23,0;"**"
240 REM "HELLS CAVERNS"
250 POKER 16418,2
260 FOR F=0 TO INT (RAND*100)+(5
270 PRINT AT 21,0;"**"
280 PRINT AT 21,Z;"**"
290 LET Z=Z+(0=1 AND Z<27)-(0=2
300 RANDO Z/0)
310 LET P=PEEK (PEEK 16398+256+
320 POKER 16399)
330 PRINT "U"
340 IF P=128 OR P=129 OR P=130
350 OR P=7 OR P=8 THEN GOTO 3000
360 SCROLL
370 LET A=A+(INKEY$="8" AND A<3
380 (INKEY$="5" AND A>1)
390 LET S=S+INT (RAND*2)+1
400 NEXT F
410 DIM A$(5,32)
420 LET A$(1)=
430 LET A$(2)=
440 LET A$(3)=
450 LET A$(4)=
460 LET A$(5)=
470 LET A$(6)=
480 FOR F=1 TO 20
490 SCROLL
500 PRINT AT 21,0,A$(F)
510 PRINT AT 0,A-1;"**"
520 NEXT F
530 FOR F=1 TO 20
540 PRINT AT F+1,A;"U"
550 LET P=PEEK (PEEK 16398+256+
560 POKER 16399)
570 PRINT AT F+1,A-1;"U"
580 IF P=CODE
590 GOTO 680
600 IF F>14 AND A=15 THEN GOTO
610
620 LET A=A+(INKEY$="8" AND A<2
630 (INKEY$="5" AND A>2)
640 NEXT F
650 PRINT AT 16,14;"U"
660 PRINT AT 18,15;"**"
670 PRINT AT 19,15;"**"
680 FOR F=0 TO 10
690 PRINT AT 19,0;"
700 PRINT AT 19,0;"
710 FOR N=0 TO 5
720 NEXT N
730 PRINT AT 19,0;"
740 FOR N=0 TO 5
750 NEXT N
760 PRINT AT 19,0;"
770 FOR N=0 TO 5
780 NEXT N
790 PRINT AT 18,15;"**"
800 LET S=S+100
810 FOR F=0 TO 100
820 NEXT F
830 FAST
840 SLOW
850 LET PHASE=PHASE+1
860 GOTO 90
870 PRINT AT F-1,A-1;"**"
880 PRINT AT F+1,A-1;"**"
890 PRINT AT 0,0;"**"
900 FOR F=1 TO 20
910 PRINT AT F,0;"**"
920 NEXT F
930 PRINT AT 21,0;"**"
940 PRINT AT 21,Z;"**"
950 LET Z=Z+(0=1 AND Z<27)-(0=2
960 RANDO Z/0)
970 LET P=PEEK (PEEK 16398+256+
980 POKER 16399)
990 PRINT "U"
1000 IF P=128 OR P=129 OR P=130
1010 OR P=7 OR P=8 THEN GOTO 3000
1020 SCROLL
1030 LET A=A+(INKEY$="8" AND A<3
1040 (INKEY$="5" AND A>1)
1050 LET S=S+INT (RAND*2)+1
1060 NEXT F
1070 POKER 16418,2
1080 PRINT AT 23,0;"**"
1090 FOR F=0 TO 23
1100 PRINT AT 0,A-1;"**"
1110 LET P=PEEK (PEEK 16398+256+
1120 POKER 16399)
1130 PRINT "U"
1140 IF P=128 OR P=129 OR P=130
1150 OR P=7 OR P=8 THEN GOTO 3000
1160 SCROLL
1170 LET A=A+(INKEY$="8" AND A<3
1180 (INKEY$="5" AND A>1)
1190 LET S=S+INT (RAND*2)+1
1200 NEXT F
1210 POKER 16418,2
1220 PRINT AT 23,0;"**"
1230 FOR F=0 TO 23
1240 PRINT AT 0,A-1;"**"
1250 LET P=PEEK (PEEK 16398+256+
1260 POKER 16399)
1270 PRINT "U"
1280 IF P=128 OR P=129 OR P=130
1290 OR P=7 OR P=8 THEN GOTO 3000
1300 SCROLL
1310 LET A=A+(INKEY$="8" AND A<3
1320 (INKEY$="5" AND A>1)
1330 LET S=S+INT (RAND*2)+1
1340 NEXT F
1350 POKER 16418,2
1360 PRINT AT 23,0;"**"
1370 FOR F=0 TO 23
1380 PRINT AT 0,A-1;"**"
1390 LET P=PEEK (PEEK 16398+256+
1400 POKER 16399)
1410 PRINT "U"
1420 IF P=128 OR P=129 OR P=130
1430 OR P=7 OR P=8 THEN GOTO 3000
1440 SCROLL
1450 LET A=A+(INKEY$="8" AND A<3
1460 (INKEY$="5" AND A>1)
1470 LET S=S+INT (RAND*2)+1
1480 NEXT F
1490 POKER 16418,2
1500 PRINT AT 23,0;"**"
1510 FOR F=0 TO 23
1520 PRINT AT 0,A-1;"**"
1530 LET P=PEEK (PEEK 16398+256+
1540 POKER 16399)
1550 PRINT "U"
1560 IF P=128 OR P=129 OR P=130
1570 OR P=7 OR P=8 THEN GOTO 3000
1580 SCROLL
1590 LET A=A+(INKEY$="8" AND A<3
1600 (INKEY$="5" AND A>1)
1610 LET S=S+INT (RAND*2)+1
1620 NEXT F
1630 POKER 16418,2
1640 PRINT AT 23,0;"**"
1650 FOR F=0 TO 23
1660 PRINT AT 0,A-1;"**"
1670 LET P=PEEK (PEEK 16398+256+
1680 POKER 16399)
1690 PRINT "U"
1700 IF P=128 OR P=129 OR P=130
1710 OR P=7 OR P=8 THEN GOTO 3000
1720 SCROLL
1730 LET A=A+(INKEY$="8" AND A<3
1740 (INKEY$="5" AND A>1)
1750 LET S=S+INT (RAND*2)+1
1760 NEXT F
1770 POKER 16418,2
1780 PRINT AT 23,0;"**"
1790 FOR F=0 TO 23
1800 PRINT AT 0,A-1;"**"
1810 LET P=PEEK (PEEK 16398+256+
1820 POKER 16399)
1830 PRINT "U"
1840 IF P=128 OR P=129 OR P=130
1850 OR P=7 OR P=8 THEN GOTO 3000
1860 SCROLL
1870 LET A=A+(INKEY$="8" AND A<3
1880 (INKEY$="5" AND A>1)
1890 LET S=S+INT (RAND*2)+1
1900 NEXT F
1910 POKER 16418,2
1920 PRINT AT 23,0;"**"
1930 FOR F=0 TO 23
1940 PRINT AT 0,A-1;"**"
1950 LET P=PEEK (PEEK 16398+256+
1960 POKER 16399)
1970 PRINT "U"
1980 IF P=128 OR P=129 OR P=130
1990 OR P=7 OR P=8 THEN GOTO 3000
2000 SCROLL
2010 LET A=A+(INKEY$="8" AND A<3
2020 (INKEY$="5" AND A>1)
2030 LET S=S+INT (RAND*2)+1
2040 NEXT F
2050 POKER 16418,2
2060 PRINT AT 23,0;"**"
2070 FOR F=0 TO 23
2080 PRINT AT 0,A-1;"**"
2090 LET P=PEEK (PEEK 16398+256+
2100 POKER 16399)
2110 PRINT "U"
2120 IF P=128 OR P=129 OR P=130
2130 OR P=7 OR P=8 THEN GOTO 3000
2140 SCROLL
2150 LET A=A+(INKEY$="8" AND A<3
2160 (INKEY$="5" AND A>1)
2170 LET S=S+INT (RAND*2)+1
2180 NEXT F
2190 POKER 16418,2
2200 PRINT AT 23,0;"**"
2210 FOR F=0 TO 23
2220 PRINT AT 0,A-1;"**"
2230 LET P=PEEK (PEEK 16398+256+
2240 POKER 16399)
2250 PRINT "U"
2260 IF P=128 OR P=129 OR P=130
2270 OR P=7 OR P=8 THEN GOTO 3000
2280 SCROLL
2290 LET A=A+(INKEY$="8" AND A<3
2300 (INKEY$="5" AND A>1)
2310 LET S=S+INT (RAND*2)+1
2320 NEXT F
2330 POKER 16418,2
2340 PRINT AT 23,0;"**"
2350 FOR F=0 TO 23
2360 PRINT AT 0,A-1;"**"
2370 LET P=PEEK (PEEK 16398+256+
2380 POKER 16399)
2390 PRINT "U"
2400 IF P=128 OR P=129 OR P=130
2410 OR P=7 OR P=8 THEN GOTO 3000
2420 SCROLL
2430 LET A=A+(INKEY$="8" AND A<3
2440 (INKEY$="5" AND A>1)
2450 LET S=S+INT (RAND*2)+1
2460 NEXT F
2470 POKER 16418,2
2480 PRINT AT 23,0;"**"
2490 FOR F=0 TO 23
2500 PRINT AT 0,A-1;"**"
2510 LET P=PEEK (PEEK 16398+256+
2520 POKER 16399)
2530 PRINT "U"
2540 IF P=128 OR P=129 OR P=130
2550 OR P=7 OR P=8 THEN GOTO 3000
2560 SCROLL
2570 LET A=A+(INKEY$="8" AND A<3
2580 (INKEY$="5" AND A>1)
2590 LET S=S+INT (RAND*2)+1
2600 NEXT F
2610 POKER 16418,2
2620 PRINT AT 23,0;"**"
2630 FOR F=0 TO 23
2640 PRINT AT 0,A-1;"**"
2650 LET P=PEEK (PEEK 16398+256+
2660 POKER 16399)
2670 PRINT "U"
2680 IF P=128 OR P=129 OR P=130
2690 OR P=7 OR P=8 THEN GOTO 3000
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2710 LET A=A+(INKEY$="8" AND A<3
2720 (INKEY$="5" AND A>1)
2730 LET S=S+INT (RAND*2)+1
2740 NEXT F
2750 POKER 16418,2
2760 PRINT AT 23,0;"**"
2770 FOR F=0 TO 23
2780 PRINT AT 0,A-1;"**"
2790 LET P=PEEK (PEEK 16398+256+
2800 POKER 16399)
2810 PRINT "U"
2820 IF P=128 OR P=129 OR P=130
2830 OR P=7 OR P=8 THEN GOTO 3000
2840 SCROLL
2850 LET A=A+(INKEY$="8" AND A<3
2860 (INKEY$="5" AND A>1)
2870 LET S=S+INT (RAND*2)+1
2880 NEXT F
2890 POKER 16418,2
2900 PRINT AT 23,0;"**"
2910 FOR F=0 TO 23
2920 PRINT AT 0,A-1;"**"
2930 LET P=PEEK (PEEK 16398+256+
2940 POKER 16399)
2950 PRINT "U"
2960 IF P=128 OR P=129 OR P=130
2970 OR P=7 OR P=8 THEN GOTO 3000
2980 SCROLL
2990 LET A=A+(INKEY$="8" AND A<3
3000 (INKEY$="5" AND A>1)
3010 LET S=S+INT (RAND*2)+1
3020 NEXT F
3030 POKER 16418,2
3040 PRINT AT 23,0;"**"
3050 FOR F=0 TO 23
3060 PRINT AT 0,A-1;"**"
3070 LET P=PEEK (PEEK 16398+256+
3080 POKER 16399)
3090 PRINT "U"
3100 IF P=128 OR P=129 OR P=130
3110 OR P=7 OR P=8 THEN GOTO 3000
3120 SCROLL
3130 LET A=A+(INKEY$="8" AND A<3
3140 (INKEY$="5" AND A>1)
3150 LET S=S+INT (RAND*2)+1
3160 NEXT F
3170 POKER 16418,2
3180 PRINT AT 23,0;"**"
3190 FOR F=0 TO 23
3200 PRINT AT 0,A-1;"**"
3210 LET P=PEEK (PEEK 16398+256+
3220 POKER 16399)
3230 PRINT "U"
3240 IF P=128 OR P=129 OR P=130
3250 OR P=7 OR P=8 THEN GOTO 3000
3260 SCROLL
3270 LET A=A+(INKEY$="8" AND A<3
3280 (INKEY$="5" AND A>1)
3290 LET S=S+INT (RAND*2)+1
3300 NEXT F
3310 POKER 16418,2
3320 PRINT AT 23,0;"**"
3330 FOR F=0 TO 23
3340 PRINT AT 0,A-1;"**"
3350 LET P=PEEK (PEEK 16398+256+
3360 POKER 16399)
3370 PRINT "U"
3380 IF P=128 OR P=129 OR P=130
3390 OR P=7 OR P=8 THEN GOTO 3000
3400 SCROLL
3410 LET A=A+(INKEY$="8" AND A<3
3420 (INKEY$="5" AND A>1)
3430 LET S=S+INT (RAND*2)+1
3440 NEXT F
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3460 PRINT AT 23,0;"**"
3470 FOR F=0 TO 23
3480 PRINT AT 0,A-1;"**"
3490 LET P=PEEK (PEEK 16398+256+
3500 POKER 16399)
3510 PRINT "U"
3520 IF P=128 OR P=129 OR P=130
3530 OR P=7 OR P=8 THEN GOTO 3000
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3550 LET A=A+(INKEY$="8" AND A<3
3560 (INKEY$="5" AND A>1)
3570 LET S=S+INT (RAND*2)+1
3580 NEXT F
3590 POKER 16418,2
3600 PRINT AT 23,0;"**"
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3620 PRINT AT 0,A-1;"**"
3630 LET P=PEEK (PEEK 16398+256+
3640 POKER 16399)
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3660 IF P=128 OR P=129 OR P=130
3670 OR P=7 OR P=8 THEN GOTO 3000
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3690 LET A=A+(INKEY$="8" AND A<3
3700 (INKEY$="5" AND A>1)
3710 LET S=S+INT (RAND*2)+1
3720 NEXT F
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3740 PRINT AT 23,0;"**"
3750 FOR F=0 TO 23
3760 PRINT AT 0,A-1;"**"
3770 LET P=PEEK (PEEK 16398+256+
3780 POKER 16399)
3790 PRINT "U"
3800 IF P=128 OR P=129 OR P=130
3810 OR P=7 OR P=8 THEN GOTO 3000
3820 SCROLL
3830 LET A=A+(INKEY$="8" AND A<3
3840 (INKEY$="5" AND A>1)
3850 LET S=S+INT (RAND*2)+1
3860 NEXT F
3870 POKER 16418,2
3880 PRINT AT 23,0;"**"
3890 FOR F=0 TO 23
3900 PRINT AT 0,A-1;"**"
3910 LET P=PEEK (PEEK 16398+256+
3920 POKER 16399)
3930 PRINT "U"
3940 IF P=128 OR P=129 OR P=130
3950 OR P=7 OR P=8 THEN GOTO 3000
3960 SCROLL
3970 LET A=A+(INKEY$="8" AND A<3
3980 (INKEY$="5" AND A>1)
3990 LET S=S+INT (RAND*2)+1
4000 NEXT F
4010 POKER 16418,2
4020 PRINT AT 23,0;"**"
4030 FOR F=0 TO 23
4040 PRINT AT 0,A-1;"**"
4050 LET P=PEEK (PEEK 16398+256+
4060 POKER 16399)
4070 PRINT "U"
4080 IF P=128 OR P=129 OR P=130
4090 OR P=7 OR P=8 THEN GOTO 3000
4100 SCROLL
4110 LET A=A+(INKEY$="8" AND A<3
4120 (INKEY$="5" AND A>1)
4130 LET S=S+INT (RAND*2)+1
4140 NEXT F
4150 POKER 16418,2
4160 PRINT AT 23,0;"**"
4170 FOR F=0 TO 23
4180 PRINT AT 0,A-1;"**"
4190 LET P=PEEK (PEEK 16398+256+
4200 POKER 16399)
4210 PRINT "U"
4220 IF P=128 OR P=129 OR P=130
4230 OR P=7 OR P=8 THEN GOTO 3000
4240 SCROLL
4250 LET A=A+(INKEY$="8" AND A<3
4260 (INKEY$="5" AND A>1)
4270 LET S=S+INT (RAND*2)+1
4280 NEXT F
4290 POKER 16418,2
4300 PRINT AT 23,0;"**"
4310 FOR F=0 TO 23
4320 PRINT AT 0,A-1;"**"
4330 LET P=PEEK (PEEK 16398+256+
4340 POKER 16399)
4350 PRINT "U"
4360 IF P=128 OR P=129 OR P=130
4370 OR P=7 OR P=8 THEN GOTO 3000
4380 SCROLL
4390 LET A=A+(INKEY$="8" AND A<3
4400 (INKEY$="5" AND A>1)
4410 LET S=S+INT (RAND*2)+1
4420 NEXT F
4430 POKER 16418,2
4440 PRINT AT 23,0;"**"
4450 FOR F=0 TO 23
4460 PRINT AT 0,A-1;"**"
4470 LET P=PEEK (PEEK 16398+256+
4480 POKER 16399)
4490 PRINT "U"
4500 IF P=128 OR P=129 OR P=130
4510 OR P=7 OR P=8 THEN GOTO 3000
4520 SCROLL
4530 LET A=A+(INKEY$="8" AND A<3
4540 (INKEY$="5" AND A>1)
4550 LET S=S+INT (RAND*2)+1
4560 NEXT F
4570 POKER 16418,2
4580 PRINT AT 23,0;"**"
4590 FOR F=0 TO 23
4600 PRINT AT 0,A-1;"**"
4610 LET P=PEEK (PEEK 16398+256+
4620 POKER 16399)
4630 PRINT "U"
4640 IF P=128 OR P=129 OR P=130
4650 OR P=7 OR P=8 THEN GOTO 3000
4660 SCROLL
4670 LET A=A+(INKEY$="8" AND A<3
4680 (INKEY$="5" AND A>1)
4690 LET S=S+INT (RAND*2)+1
4700 NEXT F
4710 POKER 16418,2
4720 PRINT AT 23,0;"**"
4730 FOR F=0 TO 23
4740 PRINT AT 0,A-1;"**"
4750 LET P=PEEK (PEEK 16398+256+
4760 POKER 16399)
4770 PRINT "U"
4780 IF P=128 OR P=129 OR P=130
4790 OR P=7 OR P=8 THEN GOTO 3000
4800 SCROLL
4810 LET A=A+(INKEY$="8" AND A<3
4820 (INKEY$="5" AND A>1)
4830 LET S=S+INT (RAND*2)+1
4840 NEXT F
4850 POKER 16418,2
4860 PRINT AT 23,0;"**"
4870 FOR F=0 TO 23
4880 PRINT AT 0,A-1;"**"
4890 LET P=PEEK (PEEK 16398+256+
4900 POKER 16399)
4910 PRINT "U"
4920 IF P=128 OR P=129 OR P=130
4930 OR P=7 OR P=8 THEN GOTO 3000
4940 SCROLL
4950 LET A=A+(INKEY$="8" AND A<3
4960 (INKEY$="5" AND A>1)
4970 LET S=S+INT (RAND*2)+1
4980 NEXT F
4990 POKER 16418,2
5000 PRINT AT 23,0;"**"
5010 FOR F=0 TO 23
5020 PRINT AT 0,A-1;"**"
5030 LET P=PEEK (PEEK 16398+256+
5040 POKER 16399)
5050 PRINT "U"
5060 IF P=128 OR P=129 OR P=130
5070 OR P=7 OR P=8 THEN GOTO 3000
5080 SCROLL
5090 LET A=A+(INKEY$="8" AND A<3
5100 (INKEY$="5" AND A>1)
5110 LET S=S+INT (RAND*2)+1
5120 NEXT F
5130 POKER 16418,2
5140 PRINT AT 23,0;"**"
5150 FOR F=0 TO 23
5160 PRINT AT 0,A-1;"**"
5170 LET P=PEEK (PEEK 16398+256+
5180 POKER 16399)
5190 PRINT "U"
5200 IF P=128 OR P=129 OR P=130
5210 OR P=7 OR P=8 THEN GOTO 3000
5220 SCROLL
5230 LET A=A+(INKEY$="8" AND A<3
5240 (INKEY$="5" AND A>1)
5250 LET S=S+INT (RAND*2)+1
5260 NEXT F
5270 POKER 16418,2
5280 PRINT AT 23,0;"**"
5290 FOR F=0 TO 23
5300 PRINT AT 0,A-1;"**"
5310 LET P=PEEK (PEEK 16398+256+
5320 POKER 16399)
5330 PRINT "U"
5340 IF P=128 OR P=129 OR P=130
5350 OR P=7 OR P=8 THEN GOTO 3000
5360 SCROLL
5370 LET A=A+(INKEY$="8" AND A<3
5380 (INKEY$="5" AND A>1)
5390 LET S=S+INT (RAND*2)+1
5400 NEXT F
5410 POKER 16418,2
5420 PRINT AT 23,0;"**"
5430 FOR F=0 TO 23
5440 PRINT AT 0,A-1;"**"
5450 LET P=PEEK (PEEK 16398+256+
5460 POKER 16399)
5470 PRINT "U"
5480 IF P=128 OR P=129 OR P=130
5490 OR P=7 OR P=8 THEN GOTO 3000
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5560 PRINT AT 23,0;"**"
5570 FOR F=0 TO 23
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5590 LET P=PEEK (PEEK 16398+256+
5600 POKER 16399)
5610 PRINT "U"
5620 IF P=128 OR P=129 OR P=130
5630 OR P=7 OR P=8 THEN GOTO 3000
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5650 LET A=A+(INKEY$="8" AND A<3
5660 (INKEY$="5" AND A>1)
5670 LET S=S+INT (RAND*2)+1
5680 NEXT F
5690 POKER 16418,2
5700 PRINT AT 23,0;"**"
5710 FOR F=0 TO 23
5720 PRINT AT 0,A-1;"**"
5730 LET P=PEEK (PEEK 16398+256+
5740 POKER 16399)
5750 PRINT "U"
5760 IF P=128 OR P=129 OR P=130
5770 OR P=7 OR P=8 THEN GOTO 3000
5780 SCROLL
5790 LET A=A+(INKEY$="8" AND A<3
5800 (INKEY$="5" AND A>1)
5810 LET S=S+INT (RAND*2)+1
5820 NEXT F
5830 POKER 16418,2
5840 PRINT AT 23,0;"**"
5850 FOR F=0 TO 23
5860 PRINT AT 0,A-1;"**"
5870 LET P=PEEK (PEEK 16398+256+
5880 POKER 16399)
5890 PRINT "U"
5900 IF P=128 OR P=129 OR P=130
5910 OR P=7 OR P=8 THEN GOTO 3000
5920 SCROLL
5930 LET A=A+(INKEY$="8" AND A<3
5940 (INKEY$="5" AND A>1)
5950 LET S=S+INT (RAND*2)+1
5960 NEXT F
5970 POKER 16418,2
5980 PRINT AT 23,0;"**"
5990 FOR F=0 TO 23
6000 PRINT AT 0,A-1;"**"
6010 LET P=PEEK (PEEK 16398+256+
6020 POKER 16399)
6030 PRINT "U"
6040 IF P=128 OR P=129 OR P=130
6050 OR P=7 OR P=8 THEN GOTO 3000
6060 SCROLL
6070 LET A=A+(INKEY$="8" AND A<3
6080 (INKEY$="5" AND A>1)
6090 LET S=S+INT (RAND*2)+1
6100 NEXT F
6110 POKER 16418,2
6120 PRINT AT 23,0;"**"
6130 FOR F=0 TO 23
6140 PRINT AT 0,A-1;"**"
6150 LET P=PEEK (PEEK 16398+256+
6160 POKER 16399)
6170 PRINT "U"
6180 IF P=128 OR P=129 OR P=130
6190 OR P=7 OR P=8 THEN GOTO 3000
6200 SCROLL
6210 LET A=A+(INKEY$="8" AND A<3
6220 (INKEY$="5" AND A>1)
6230 LET S=S+INT (RAND*2)+1
6240 NEXT F
6250 POKER 16418,2
6260 PRINT AT 23,0;"**"
6270 FOR F=0 TO 23
6280 PRINT AT 0,A-1;"**"
6290 LET P=PEEK (PEEK 16398+256+
6300 POKER 16399)
6310 PRINT "U"
6320 IF P=128 OR P=129 OR P=130
6330 OR P=7 OR P=8 THEN GOTO 3000
6340 SCROLL
6350 LET A=A+(INKEY$="8" AND A<3
6360 (INKEY$="5" AND A>1)
6370 LET S=S+INT (RAND*2)+1
6380 NEXT F
6390 POKER 16418,2
6400 PRINT AT 23,0;"**"
6410 FOR F=0 TO 23
6420 PRINT AT 0,A-1;"**"
6430 LET P=PEEK (PEEK 16398+256+
6440 POKER 16399)
6450 PRINT "U"
6460 IF P=128 OR P=129 OR P=130
6470 OR P=7 OR P=8 THEN GOTO 3000
6480 SCROLL
6490 LET A=A+(INKEY$="8" AND A<3
6500 (INKEY$="5" AND A>1)
6510 LET S=S+INT (RAND*2)+1
6520 NEXT F
6530 POKER 16418,2
6540 PRINT AT 23,0;"**"
6550 FOR F=0 TO 23
6560 PRINT AT 0,A-1;"**"
6570 LET P=PEEK (PEEK 16398+256+
6580 POKER 16399)
6590 PRINT "U"
6600 IF P=128 OR P=129 OR P=130
6610 OR P=7 OR P=8 THEN GOTO 3000
6620 SCROLL
6630 LET A=A+(INKEY$="8" AND A<3
6640 (INKEY$="5" AND A>1)
6650 LET S=S+INT (RAND*2)+1
6660 NEXT F
6670 POKER 16418,2
6680 PRINT AT 23,0;"**"
6690 FOR F=0 TO 23
6700 PRINT AT 0,A-1;"**"
6710 LET P=PEEK (PEEK 16398+256+
6720 POKER 16399)
6730 PRINT "U"
6740 IF P=128 OR P=129 OR P=130
6750 OR P=7 OR P=8 THEN GOTO 3000
6760 SCROLL
6770 LET A=A+(INKEY$="8" AND A<3
6780 (INKEY$="5" AND A>1)
6790 LET S=S+INT (RAND*2)+1
6800 NEXT F
6810 POKER 16418,2
6820 PRINT AT 23,0;"**"
6830 FOR F=0 TO 23
6840 PRINT AT 0,A-1;"**"
6850 LET P=PEEK (PEEK 16398+256+
6860 POKER 16399)
6870 PRINT "U"
6880 IF P=128 OR P=129 OR P=130
6890 OR P=7 OR P=8 THEN GOTO 3000
6900 SCROLL
6910 LET A=A+(INKEY$="8" AND A<3
6920 (INKEY$="5" AND A>1)
6930 LET S=S+INT (RAND*2)+1
6940 NEXT F
6950 POKER 16418,2
6960 PRINT AT 23,0;"**"
6970 FOR F=0 TO 23
6980 PRINT AT 0,A-1;"**"
6990 LET P=PEEK (PEEK 16398+256+
7000 POKER 16399)
7010 PRINT "U"
7020 IF P=128 OR P=129 OR P=130
7030 OR P=7 OR P=8 THEN GOTO 3000
7040 SCROLL
7050 LET A=A+(INKEY$="8" AND A<3
7060 (INKEY$="5" AND A>1)
7070 LET S=S+INT (RAND*2)+1
7080 NEXT F
7090 POKER 16418,2
7100 PRINT AT 23,0;"**"
7110 FOR F=0 TO 23
7120 PRINT AT 0,A-1;"**"
7130 LET P=PEEK (PEEK 16398+256+
7140 POKER 16399)
7150 PRINT "U"
7160 IF P=128 OR P=129 OR P=130
7170 OR P=7 OR P=8 THEN GOTO 3000
7180 SCROLL
7190 LET A=A+(INKEY$="8" AND A<3
7200 (INKEY$="5" AND A>1)
7210 LET S=S+INT (RAND*2)+1
7220 NEXT F
7230 POKER 16418,2
7240 PRINT AT 23,0;"**"
7250 FOR F=0 TO 23
7260 PRINT AT 0,A-1;"**"
7270 LET P=PEEK (PEEK 16398+256+
7280 POKER 16399)
7290 PRINT "U"
7300 IF P=128 OR P=129 OR P=130
7310 OR P=7 OR P=8 THEN GOTO 3000
7320 SCROLL
7330 LET A=A+(INKEY$="8" AND A<3
7340 (INKEY$="5" AND A>1)
7350 LET S=S+INT (RAND*2)+1
7360 NEXT F
7370 POKER 16418,2
7380 PRINT AT 23,0;"**"
7390 FOR F=0 TO 23
7400 PRINT AT 0,A-1;"**"
7410 LET P=PEEK (PEEK 16398+256+
7420 POKER 16399)
7430 PRINT "U"
7440 IF P=128 OR P=129 OR P=130
7450 OR P=7 OR P=8 THEN GOTO 3000
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7500 NEXT F
7510 POKER 16418,2
7520 PRINT AT 23,0;"**"
7530 FOR F=0 TO 23
7540 PRINT AT 0,A-1;"**"
7550 LET P=PEEK (PEEK 16398+256+
7560 POKER 16399)
7570 PRINT "U"
7580 IF P=128 OR P=129 OR P=130
7590 OR P=7 OR P=8 THEN GOTO 3000
7600 SCROLL
7610 LET A=A+(INKEY$="8" AND A<3
7620 (INKEY$="5" AND A>1)
7630 LET S=S+INT (RAND*2)+1
7640 NEXT F
7650 POKER 16418,2
7660 PRINT AT 23,0;"**"
7670 FOR F=0 TO 23
7680 PRINT AT 0,A-1;"**"
7690 LET P=PEEK (PEEK 16398+256+
7700 POKER 16399)
7710 PRINT "U"
7720 IF P=128 OR P=129 OR P=130
7730 OR P=7 OR P=8 THEN GOTO 3000
7740 SCROLL
7750 LET A=A+(INKEY$="8" AND A<3
7760 (INKEY$="5" AND A>1)
7770 LET S=S+INT (RAND*2)+1
7780 NEXT F
7790 POKER 16418,2
7800 PRINT AT 23,0;"**"
7810 FOR F=0 TO 23
7820 PRINT AT 0,A-1;"**"
7830 LET P=PEEK (PEEK 16398+256+
7840 POKER 16399)
7850 PRINT "U"
7860 IF P=128 OR P=129 OR P=130
7870 OR P=7 OR P=8 THEN GOTO 3000
7880 SCROLL
7890 LET A=A+(INKEY$="8" AND A<3
7900 (INKEY$="5" AND A>1)
7910 LET S=S+INT (RAND*2)+1
7920 NEXT F
7930 POKER 16418,2
7940 PRINT AT 23,0;"**"
```





```

10 BORDER 4: PAPER 4: INK 0: C
LS
20 PRINT AT 0,13;"GOLF"
30 PRINT AT 2,0;" The idea of
the game is to aim the golf bal
1 into the hole. You will hav
e control of:-"; AT 6,0;"Velocit
y - positive values up to
50.
Angle
- positive values up to <
40 PRINT AT 12,4;"Play lasts
for 9 holes."; AT 14,0;"Press an
y key to commence play.": PAUSE
0
50 CLS : LET br=100
60 FOR a=0 TO 39: READ b: POKE
USR "a"+a,b: NEXT a: LET t=0
70 FOR a=1 TO 9: LET s=1: LET
h= INT (100+ RND *150)
80 PAUSE 50: CLS : PRINT AT 2
0,0; INK 7;"B"; AT 21,0;"C": CIR
CLE h+4,2,2: PLOT h+4,2: DRAW 0,
20: DRAW -4,-4: DRAW 4,-4: PRINT
AT 0,0;"Shot number=";s; AT 2,
0;"Hole number=";a; AT 4,0;"Yard
s to hole=";h
90 INPUT "Velocity ";u: IF u>5
0 OR u<0 THEN GO TO 90
100 INPUT "Angle ";z: IF z>80 O
R z<10 THEN GO TO 100
110 LET u=u-1: LET z=z* PI /180
: PRINT AT 20,0; INK 7;"D"; AT
21,0;"E": BEEP .5,30
120 FOR x=0 TO 255
130 LET w=x/(u* COS z): LET y=w

```

```

*(u* SIN z-4.9*w): IF y<0 AND x>
0 THEN GO TO 160
140 PLOT INK 7;x+4,y
150 NEXT x
160 LET s=s+1: LET h= ABS (h-x)
170 IF h <= 10 THEN GO TO 190
180 GO TO 80
190 CLS
200 IF h=0 THEN PRINT AT 1,0;
"You have managed to drive the
ball into the hole.": LET t=t+s
-1
210 IF h>0 THEN PRINT AT 0,0;
>Your ball lands on the green an
d you manage to putt the ball wit
h your next shot.": LET t=t+s
220 PRINT AT 4,0;"Your scoreca
rd to date is:-"; AT 6,0;t;" sho
ts taken for ";a;" holes.": AT 1
0,0;"Press any key to continue p
lay."
230 PAUSE 0: NEXT a: IF t<br TH
EN LET br=t: PRINT AT 10,0;"Yo
u have completed the best ro
und of golf on this course by sc
oring a ";br;".
240 PRINT AT 15,0;"Press any k
ey for another game.": PAUSE 0:
RESTORE : GO TO 60
300 DATA 240,240,112,48,16,16,1
6,16
310 DATA 6,6,196,132,140,148,17
2,244
320 DATA 4,4,11,17,17,17,17,17
330 DATA 12,12,8,8,62,42,42,42
340 DATA 60,8,60,74,74,74,74,90

```

**T**his game of Golf is played over nine holes and the aim is, of course, to hit your ball into the holes using as few strokes as possible. You choose the velocity and angle of the golf ball, the computer will do the rest.

Written for the Spectrum by David Yates.



# GOLF



# QUESTLINE

## Spiderman and The Sandman Cometh

**Cathy Foot looks at Spiderman, the latest in the Questprobe series, and The Sandman cometh, from Stardreams.**

**P**SST — hey, you out there — wanna trade places with Spiderman? You can now, you know! There is never a dull moment in this job — only yesterday I was **Spiderman**, opening lift gates with my super spider powers, since I had become tired of waiting for a lift that would not come, climbing up the lift shaft, and generally being Spiderman to the best of my poor ability.

There I was, trying my wings as Spiderman for the first time. I knew already that I was expected to move in three dimensions in this game, rather than its being all on the same level — it was for this reason that I was told not to map the games being reviewed this month, after all — but the darn lift would not come and I was unable to find the stairs, so I exerted my spider powers and snapped those gates open — still no lift! Ah, well, now was as good a time as any to find out whether I was Spiderman or Peter Parker at that

moment. I stepped out bravely into the void and found myself clinging to the side of the lift shaft. I tried going down, but “something stops me”.

The Health and Safety boys slipped up badly over the fire regulations on this building, since the only means of access between floors seems to be a non-operating lift: I found no sign of a staircase taking off from any of the lobbies nor even any way out of the building for anyone not in the possession of super powers.

But the building is even weirder than that — what I have said so far merely makes it a fire trap. Take a **GOOD** look at the design of this building, I’m **VERY** glad I was specifically told **NOT** to produce any maps for this month’s issue! Have you spotted what is wrong with the building yet? Take it very slowly — open the lift doors and go up a floor; you come out onto a very small amount of floor space, so small that it consists of only the waiting room.

There is an exit from the waiting room, but you **NEED** to be a Superhero to take it, since, when you go west from here it is punningly correct for a normal person, because you find yourself clinging to the **OUTSIDE** wall at

the **TOP** of a skyscraper (you can get onto the roof of the building too, by the way!).

Now go back in, re-enter the lift shaft and go up a floor, where you will find five rooms cunningly balanced on top of the **ONE** room below them, and one floor **ABOVE** the top floor. The Planning Department must have been drunk to a man when they passed this one! Euclid’s enemies strike again!

While wandering round this **aMAZEing** building you will discover many enemies going about their nefarious businesses — or should I say “staying” about their businesses, since they never seem to leave their rooms. Funny, that. For a moment, at least, I thought I was in the Daily Bugle offices, but even Jonah would not employ these guys.

The only thing that I have found for sure that works in the room with the gem fragment and the Natter Energy Egg, is to back out again fast, otherwise you need to take an interesting side trip into **Limbo** — somewhere below **Heaven** and above **Earth**, I gather — before getting back to the nitty-gritty of solving the game and saving the world.

Another problem I hit was in playing around with the chemicals — you always seem to have too many to be able to mix them together but, since the Spectrum recognises the word “mix,” it must be possible to mix them somehow. Try a stricter segregation between the ingredients you want to mix and the rest — such as putting a closed door between them.

One of the more pleasant aspects of this game is the ease with which one can shrug off one’s disappointments. Somehow, finding that the solution of the first problem leads directly to the emergence of a fresh one can be accepted with equanimity — like the problem of walking about on

To: Questline, Sinclair Programs,  
 Priors Court, 30-32 Farringdon Lane,  
 London EC1

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# SPIDER-MAN

SINCLAIR PROGRAMS March 1985



walls. Something stops me. Since it cannot be sheer terror that stops Spiderman, it is more than likely to be problems with web. Yes, web dispensers are empty. O.K. that must be what some of the chemicals are for, to make some more. Even if this is not what is stopping me from moving over the sides of the building, Spiderman cannot fight with empty web dispensers. It would be like asking James Bond to fight with an empty gun.

If you remember that Spiderman is never a vandal, you may save yourself time and effort, although there is at least one place where he is allowed to break something — he is allowed to remove some wire mesh in order to enter the ventilation system.

At no time in Spiderman did I actually get down and chew the carpet in rage and frustration, although other games have left their mark and, until SOMEONE invents a logical, acceptable vocabulary AND MAKES IT STICK, there will always be programs best worked at from inside a padded cell and with expert medical advice on hand.

There is another category of adventures — the “too clever by

half” school and, unfortunately, it is here that **The Sandman Cometh** belongs. Sure, once you discover what is going on, everything makes sense, but so what?

It took me ages to get into **The Sandman Cometh**. I get a distinct feeling that they were impressed by **Mindbender** from Gilsoft — so was I — but this program is too complicated for my liking, if only because I found no satisfaction in solving any of the problems set.

I must admire the SCREEN\$. When that came up I quivered with anticipation, if the program was as titillating I was in for something really good. I could hardly wait! Then came a string of disappointments; first one of my cats walked across the keyboard while I was out of the room, and, in so doing, broke into the program for me. I have no idea how it was done all I know is that it CAN be broken into. Next I could not get through the door. It took me ages to find the key — I forgot I had been told where to find it — “tmcdq sgd lzs.” If you also need to know, move the letters in that phrase on by one.

On the other side of the door lies a corridor with rooms off it on either side. These rooms are best

tackled in the order that you come to them, as they get progressively more difficult and, while it is not too obvious at the start, if you have not coped with the first one, you lack the information, etc., to tackle subsequent ones.

The first time I went through I was just browsing, with the result that the only thing that happened in the Cheddar Cat's room was that I picked up some items and the lifejacket disappeared in a puff of smoke, but I got out asleep. I was shot dead by the gunslinger in the third room, and woke up, and could do nothing at all in the 007 cell. There, before I awoke, I was told that I had tackled this room out of turn and in a state of unpreparedness, which was true enough, but rather depressing.

Then the universe folds itself. I have crossed this point, but some things should be left undisclosed.

Let us go more fully into what lies beyond the first door, on which is written “All The Fun Of.” Inside you are looking at a fairground. There are only two routes you can take. It would appear that you are not allowed to walk on the grass, so take the paths and use the compass given; but before you do, pick up the mallet and stake, you do need them.

I would suggest you then take a trip on the Ghost Train, which offers a better than average ride — all the way to Transylvania where, as you can guess, you find a use for the mallet and stake. You cannot take the round trip by train, but there is a way through if you don't mind getting wet which takes you back to the fairground and your next problem — the Shooting Gallery.

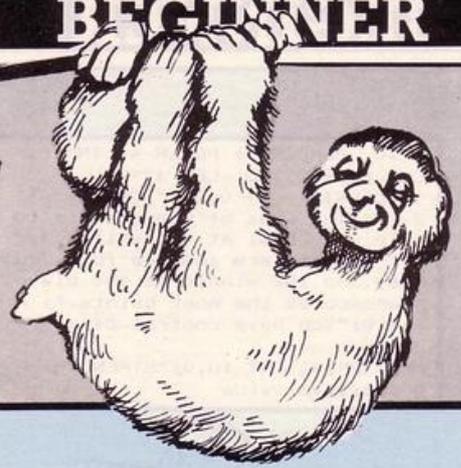
Best of luck, and keep calm.

I think it fair to say that if you enjoy games like **Mindbender**, and can cope with the lateral thinking and variable vocabularies without too much frustration, you may well enjoy this game — I did not.

**Spiderman is produced by Adventure International, 85 New Summer Street, Birmingham and costs £9.95.**

**The Sandman Cometh is produced by Star Dreams, 17 Barn Close, Seaford, East Sussex and costs £10.95.**

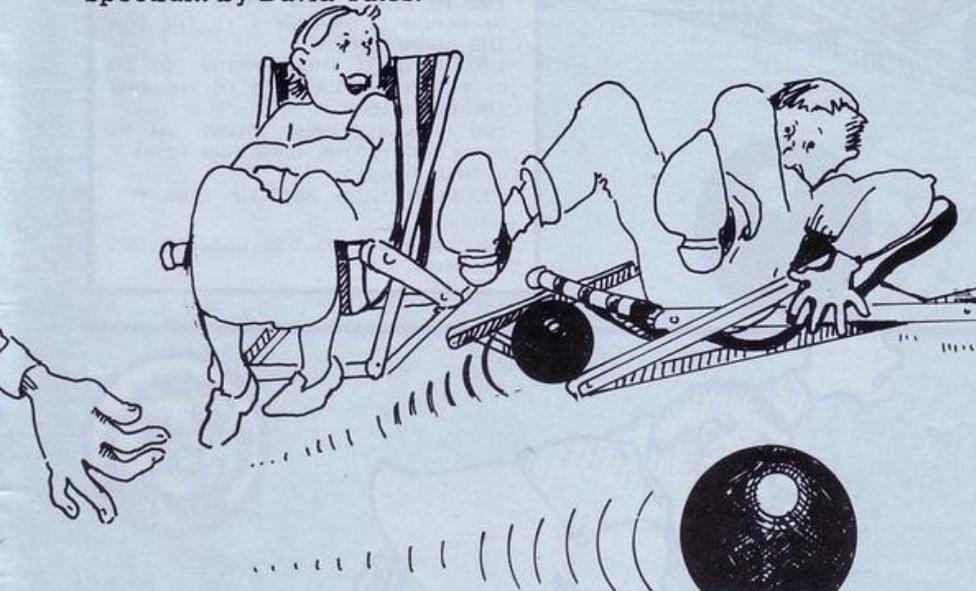
# Programming -- Slow and easy with Computer Sloth



**A**IM YOUR bowling ball at the white jack. Points will be awarded for accuracy and the winner will be the player with the most points at the end of the game. You have control of both the strength and the bias of the ball.

Bowling was written for the Spectrum by David Yates.

# BOWLING



**T**HIS program uses a special graphic character. It is indicated in this listing as an underlined "A". To enter, press "A" in graphics mode (Caps shift/9).

**VARIABLES**

A variable is a name you give a value which will then tell your Spectrum where the value is stored in memory. A list of the important variables will help you to understand how Bowls works. j1 and j2 are scores for the two players e is the strength of a bowl (measured as the number of pixels or adjacent dots the bowl will run on the screen). f is the bias of a bowl (measured as the maximum number of pixels the bowl can deviate either side of a straight run). z and y are the coordinates of the jack, selected randomly for each bowl. d is the player number (1 or 2).

**HOW IT WORKS**

Line  
10 Sets screen colours and scores to zero.  
20-40 Print instructions and wait for key press to start.  
50 Reads data for the User Defined Graphic representing a ball (bowl or jack) and POKEs into graphic "A".  
60 Starts looping for a five bowl count (loop counter c). Calls subroutine at lines 110-120 to find coordinates of the jack. Starts loop for player number (loop counter d).  
70-80 Prompt player d for strength and bias and check that answers are within limits. Reset amount of deviation (h) to zero.

90 Loop on pixel count for strength of bowl (counter g). Calculates x coordinate of bowl for each y pixel move. The bowl always starts with x=125 pixels on the bottom row (i.e. y=g=0). The deviation is given by  $f * \sin h$ , where h is incremented by  $\pi/280$  for each loop. This gives a sine wave pattern with a maximum swing (plus or minus depending on sign of bias) at 140 pixel rows up from the bottom of the screen.

100 Calls the subroutine at lines 130 to 140 to calculate the score. Loops back for next player. Calls subroutine at line 150 to print scores for both players on each bowl and loops back for next bowl.

110-120 Subroutine to calculate and print random coordinates of jack.

130-140 Subroutine to work out scores. i1 and i2 are x and y distances between bowl and jack, with i as the resultant. Maximum score for one bowl is 100. Score is added to appropriate player's total score.

150 Subroutine to print score, and return for next bowl.

160-180 Print final score when five bowls each played.

190 Re-run.

2000 Data for UDG.

Continued on next page

```

10 BORDER 4: PAPER 4: INK 0:
CLS : LET j1=0: LET j2=0
20 PRINT AT 0,12;"BOWLS"; AT
2,0;" The idea of the game is to
aim your bowl at the white 'jac
k'. Points are awarded for accu
racy, and the winner is the playe
r whoscores the most points."; A
T 8,0;"You have control of:-"

30 PRINT AT 10,0;"STRENGTH -
A positive value

```

```

between 0 & 170."; AT 13,0;"BIAS
- +ve/-ve values up to
125."; AT 16,0;"NB. Positi
ve values will cause deviation
to the right, whilst negative
values to the left."
40 PRINT AT 20,0;"Press any k
ey to commence play (lasting fo
r 5 bowling 'ends').": PAUSE 0:
CLS
50 FOR a=0 TO 7: READ b: POKE
USR "a"+a,b: NEXT a

```

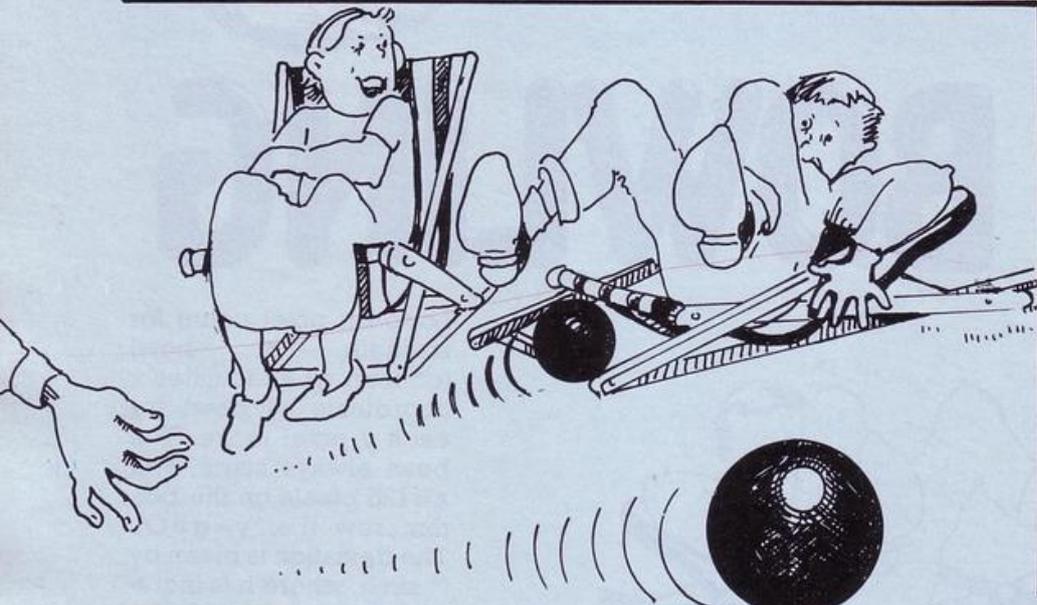
```

60 FOR c=1 TO 5: GO SUB 110: F
OR d=1 TO 2
70 INPUT "Strength ";e: IF e>1
70 OR e<0 THEN GO TO 70
80 LET h=0: INPUT "Bias ";f: I
F f<-125 OR f>125 THEN GO TO 80

90 FOR g=0 TO e: PLOT INK d;1
25+(f*SIN h),g: BEEP .01,(d*20)
: LET h=h+(PI/280): NEXT g
100 GO SUB 130: NEXT d: GO SUB
150
110 LET x=INT(3+RND*24): LE
T y=INT(RND*15): PRINT AT 2
1,15;"A"; AT y,x: INK 7;"A"
120 LET x=(x*B)+4: LET y=((21-y
)*8)+4: RETURN
130 LET i1=ABS(x-125-(f*SIN
h)): LET i2=ABS(y-e): LET i=10
0-(INT(SQR((i1↑2)+(i2↑2)))

140 LET j1=j1+((2-d)*i): LET j2
=j2+((d-1)*i): RETURN
150 PRINT AT 0,0;"Player 1=";j
1: AT 0,15;"Player 2=";j2: BEEP
1,45: CLS: NEXT c
160 IF j1>j2 THEN PRINT AT 10
,0: FLASH 1;"PLAYER 1 IS THE BOW
LING CHAMPION"
170 IF j2>j1 THEN PRINT AT 10
,0: FLASH 1;"PLAYER 2 IS THE BOW
LING CHAMPION"
180 IF j1=j2 THEN PRINT AT 10
,0: FLASH 1;"THE GAME HAS RESULT
ED IN A DRAW!"
190 BEEP 5,30: RESTORE: GO TO
10
200 DATA 60,126,255,255,255,255
,126,60

```



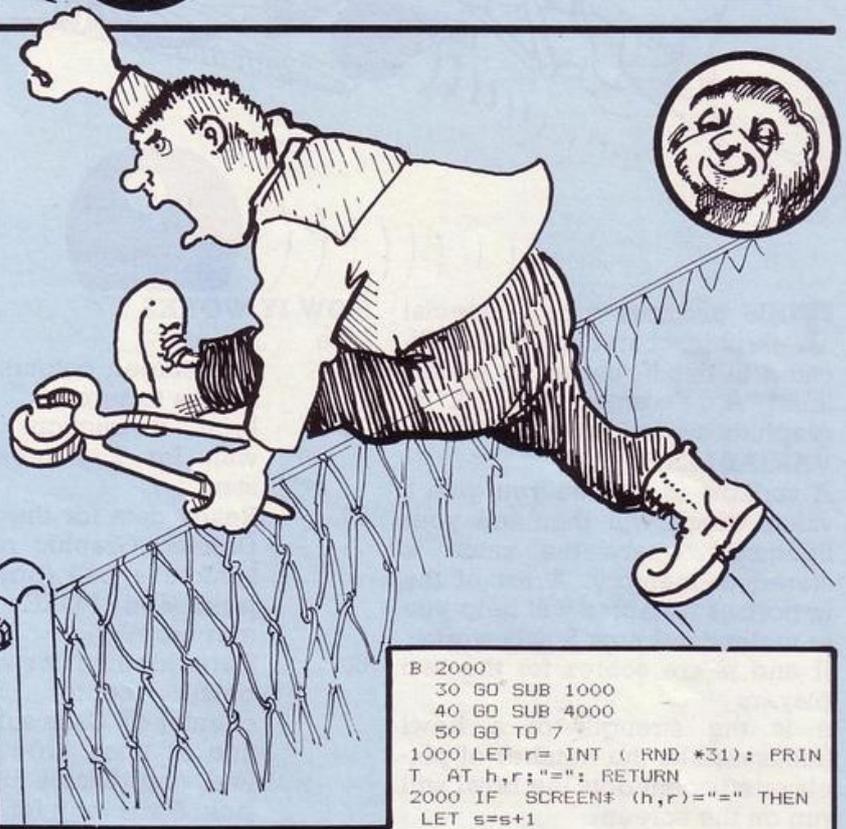
```

110 LET x=INT(3+RND*24): LE
T y=INT(RND*15): PRINT AT 2
1,15;"A"; AT y,x: INK 7;"A"
120 LET x=(x*B)+4: LET y=((21-y
)*8)+4: RETURN
130 LET i1=ABS(x-125-(f*SIN
h)): LET i2=ABS(y-e): LET i=10
0-(INT(SQR((i1↑2)+(i2↑2)))

140 LET j1=j1+((2-d)*i): LET j2
=j2+((d-1)*i): RETURN
150 PRINT AT 0,0;"Player 1=";j
1: AT 0,15;"Player 2=";j2: BEEP
1,45: CLS: NEXT c
160 IF j1>j2 THEN PRINT AT 10
,0: FLASH 1;"PLAYER 1 IS THE BOW
LING CHAMPION"
170 IF j2>j1 THEN PRINT AT 10
,0: FLASH 1;"PLAYER 2 IS THE BOW
LING CHAMPION"
180 IF j1=j2 THEN PRINT AT 10
,0: FLASH 1;"THE GAME HAS RESULT
ED IN A DRAW!"
190 BEEP 5,30: RESTORE: GO TO
10
200 DATA 60,126,255,255,255,255
,126,60

```

# STOP THAT FENCE



In the centre of the screen appears Fred (represented by an O). Fred is a determined man and, at the moment, he is determined that no new fences will be erected in his home town of Molesworth. Unfortunately, a fence is being erected at the top of the screen. Fred plans to cut through the fence.

Control Fred with the cursor keys 5, 8 and 0.

Stop that Fence was written for the Spectrum by Hal Pawson of north London.

```

1 LET s=PI-PI
2 LET x=5
3 LET y=3*x
4 PRINT AT x,y-1;" O "
5 LET h=1
7 GO SUB 1000
8 GO SUB 4000
10 LET y=y+(INKEY#="8" AND y
<30)-(INKEY#="5" AND y>0)
15 PRINT AT x,y-1;" O "
20 IF INKEY#="0" THEN GO SU

```

```

B 2000
30 GO SUB 1000
40 GO SUB 4000
50 GO TO 7
1000 LET r=INT(RND*31): PRIN
T AT h,r;"=": RETURN
2000 IF SCREEN$(h,r)="=" THEN
LET s=s+1
2010 FOR n=4 TO 1 STEP -1: PRINT
AT n,y;"↑": AT n+1,y;" ": NEXT
n: RETURN
4000 LET q=0
4010 FOR n=1 TO 30
4020 IF SCREEN$(h,n)="=" THEN
LET q=q+1
4030 NEXT n
4040 IF q=30 THEN GO SUB 5000
4050 RETURN
5000 CLS: PRINT "THE WALL IS CO
MPLATE" "YOU HAVE SCORED":s

```

# Join The Dots



The numbers 1 to 9 appear on the screen. Touch the numbers, in numerical order, with your glowing tail. When you have finished, press S to see how many moves you made. Move with the cursor keys, 5 to 8.

Join the Dots was written for the ZX-81 by J Borrett of Truro, Cornwall.

```

1 LET a=0
10 FOR f=1 TO 9
20 PRINT AT INT ( RND *10),
INT ( RND *10);f
30 NEXT f
40 LET x=30
50 LET y=x
60 LET x=x+( INKEY$ ="8")-( IN
KEY$ ="5")
70 LET y=y+( INKEY$ ="7")-( IN
KEY$ ="6")
100 PLOT x,y
101 LET a=a+1
105 IF INKEY$ ="s" THEN GO TO
500
110 GO TO 60
500 CLS
505 PRINT "YOU TOOK";a;" MOVE
S"

```

**P**atrick, the seemingly indefatigable young snake, is coiling and uncoiling across the screen of your Spectrum. In order to arrest his attention for a moment you must blow peas from your pea shooter to hit Patrick on the head. Fire using any key.

Snake Bytes was written for the ZX-81 by Sophie Sharp of Preston, Lancashire.

## SNAKE BYTES

```

10 LET s=0
20 LET f=0
35 PRINT AT 11,16;"(ig2:ig1)"
40 FOR j=0 TO 28
50 PRINT AT 5,j;" ---(ig4)"
55 GO SUB 110
60 NEXT j
70 FOR j=28 TO 0 STEP -1
80 PRINT AT 5,j;" ---(ig4)"

```

```

85 GO SUB 200
90 NEXT j
100 GO TO 40
200 IF INKEY$ =" " THEN RETURN
205 LET f=f+1
210 FOR k=10 TO 0 STEP -1
215 IF SCREEN$ (k,16)="-" THEN
GO SUB 1000
220 PRINT AT k,16;"."; AT k,16
;" "
230 NEXT k
240 RETURN
1000 LET s=s+1
1010 PRINT "A HIT. YOUR SCORE I
S NOW ";s
1015 PRINT "YOU HAVE FIRED ";f;"
" SHOTS"
1017 FOR z=1 TO 300: NEXT z
1018 CLS
1020 GO TO 35

```





# HALL OF THE SPIDERS



```

1 LET s=0: LET p=20: LET x=1
2 FOR a=1 TO 30: PRINT AT x,
a;"m": NEXT a
3 LET b=1: LET c=40
20 IF b=30 THEN GO SUB 4000
30 GO SUB 1000
40 IF b=6 THEN GO SUB 3000
50 IF INKEY#="8" THEN LET b
=b+1
60 IF SCREEN#(p,b+1)=". " THE
N GO SUB 3000
70 PRINT AT p,b;" 0"
80 GO SUB 2000
90 GO SUB 20
1000 LET c= INT ( RND *31)
1010 FOR a=2 TO 20
1020 PRINT AT a,c;". "
1030 NEXT a
1040 RETURN
2000 FOR a=1 TO 3
2010 LET c= INT ( RND *32)
2020 FOR d=20 TO 2 STEP -1
2030 PRINT AT d,c;" "
2040 NEXT d
2050 NEXT a
2060 RETURN
3000 CLS
3010 PRINT " YOU HAVE BEEN CAUGH
T"
3020 PRINT " YOUR SCORE IS ";s
3030 STOP
4000 CLS
4010 LET s=s+1
4020 PRINT "YOU HAVE COMPLETED "
;s;" CROSSINGS"
4030 PAUSE 100
4040 CLS
4050 GO TO 10

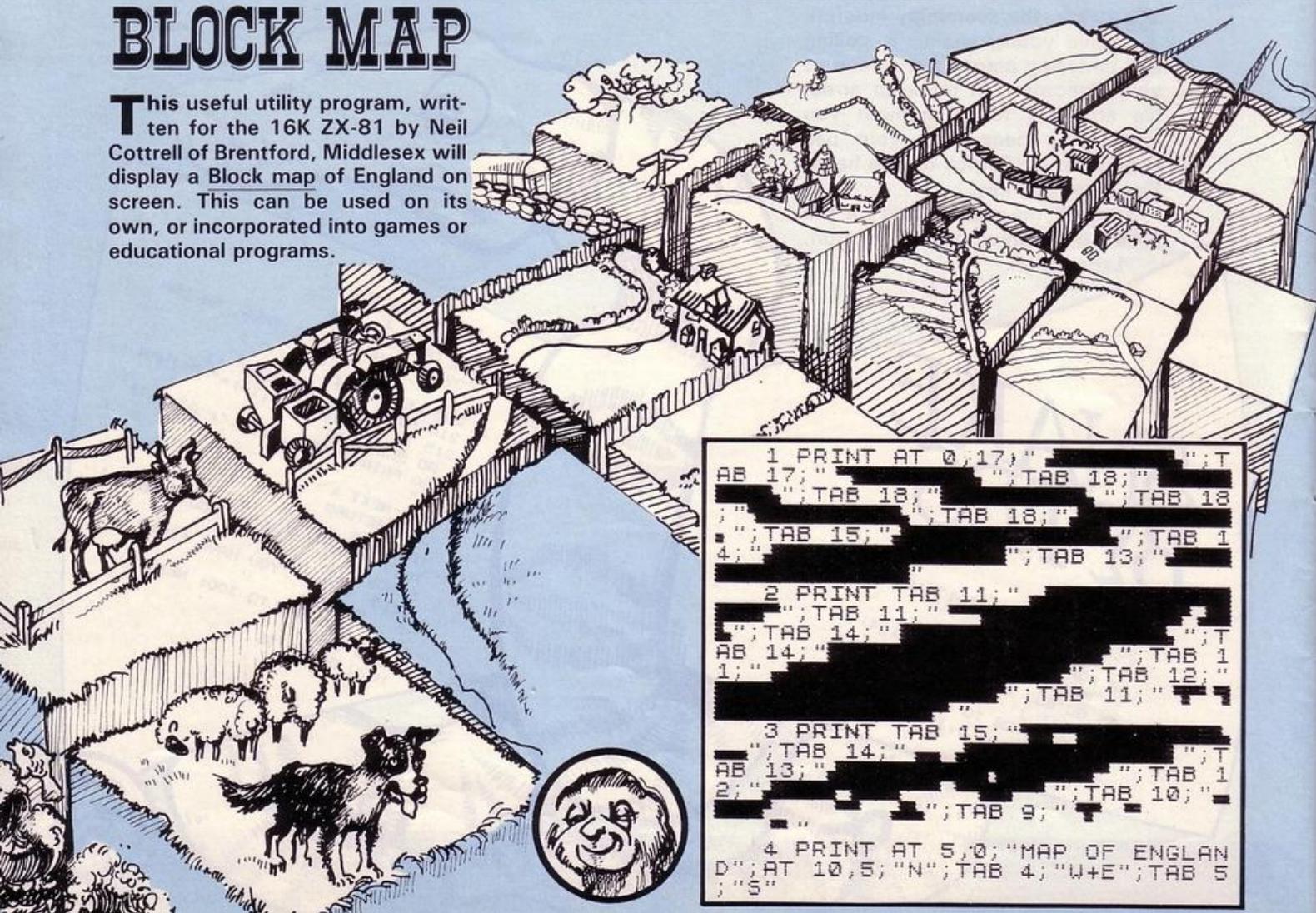
```

**N**o one has ever passed through the Hall of the Spiders and survived. Now you aim to do just that. Avoid their sticky threads and you will come through alive. The smallest touch of a thread will leave you a helpless prisoner to be eaten by the spiders. Move through the hall using keys 5 and 8 to move left and right. How many halls can you cross and survive?

Written for the Spectrum by Chloe Stapleton-Hall of Howarth, Yorkshire.

## BLOCK MAP

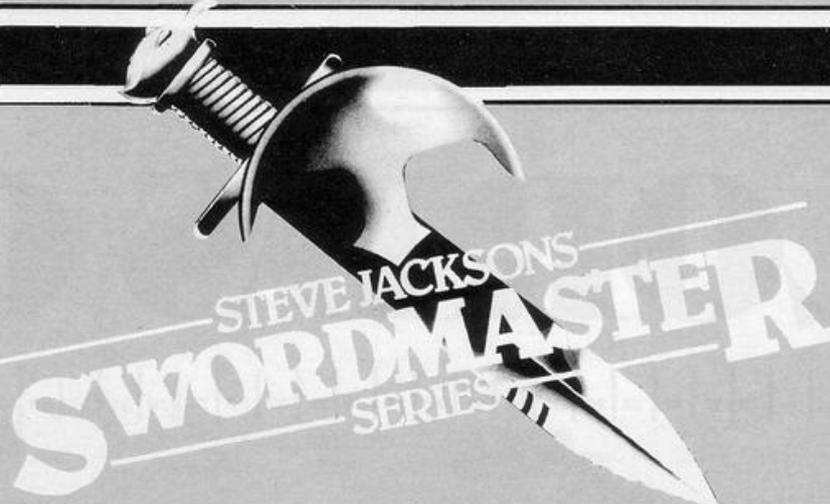
**T**his useful utility program, written for the 16K ZX-81 by Neil Cottrell of Brentford, Middlesex will display a Block map of England on screen. This can be used on its own, or incorporated into games or educational programs.



```

1 PRINT AT 0,17;" " ;TAB 18;"
AB 17;" " ;TAB 18;"
" ;TAB 18;" " ;TAB 18
" ;TAB 18;" " ;TAB 18;"
" ;TAB 15;" " ;TAB 1
4;" " ;TAB 13;"
"
2 PRINT TAB 11;"
" ;TAB 11;"
" ;TAB 14;" " ;TAB 1
AB 14;" " ;TAB 1
1;" " ;TAB 12;"
" ;TAB 11;"
"
3 PRINT TAB 15;"
" ;TAB 14;" " ;TAB 1
AB 13;" " ;TAB 1
2;" " ;TAB 10;"
" ;TAB 9;"
"
4 PRINT AT 5,0;"MAP OF ENGLAN
D";AT 10,5;"N";TAB 4;"W+E";TAB 5
;"S"

```



# 50 COPIES OF SWORDMASTER FROM ADVENTURE INTERNATIONAL TO BE WON

Swordmaster is the result of a collaboration between Adventure International and Steve Jackson of Games Workshop. The result is a unique combination of book and computer game which Adventure International consider to be the best computerised version of Dungeons and Dragons ever produced.

The game begins as you take your Swordmaster to training school. You emerge from that school with a rating which you carry with you into the game. The body of the game takes you into the elaborate world of dungeons and dragons. Each location you enter is described in detail in the accompanying book, but the monsters which you meet are assigned by locations by the computer at the start of each game and so cannot be expected or avoided.

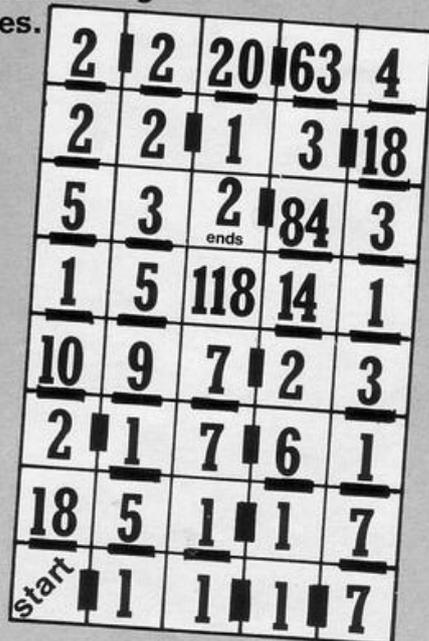
On completion of the game you attain a new swordmaster rating which can be carried on into forthcoming games in the Swordmaster series.

**HOW TO ENTER.** The diagram shows a collection of rooms, some of which are linked with doors, all of which contain monsters of different strengths. Your first task is to work out the quickest route from start to finish without visiting any room more than once. The number of rooms that you have visited, including the start and finish is your first answer.

Now look at the strengths of the monsters as you follow this route. You start with a strength of 100. The first time you meet a monster you lose in battle, but you beat the next monster that you meet. This pattern of a loss followed by a win continues until you reach the very last room. Whenever you win, your strength is multiplied by the strength of the monster in that room. Whenever you lose, your strength is divided by the strength of the monster in that room. What is your final strength?

Fill in the two answers together with your name and address on the entry form in this issue and post it to us to arrive by the end of March 1985.

Employees of EMAP and Adventure International are not eligible to enter. The editor's decision in all matters concerning the competition is final.



I HAD TO CROSS ..... ROOMS

MY FINAL STRENGTH WAS .....

MY FAVOURITE COMPUTER GAME IS .....

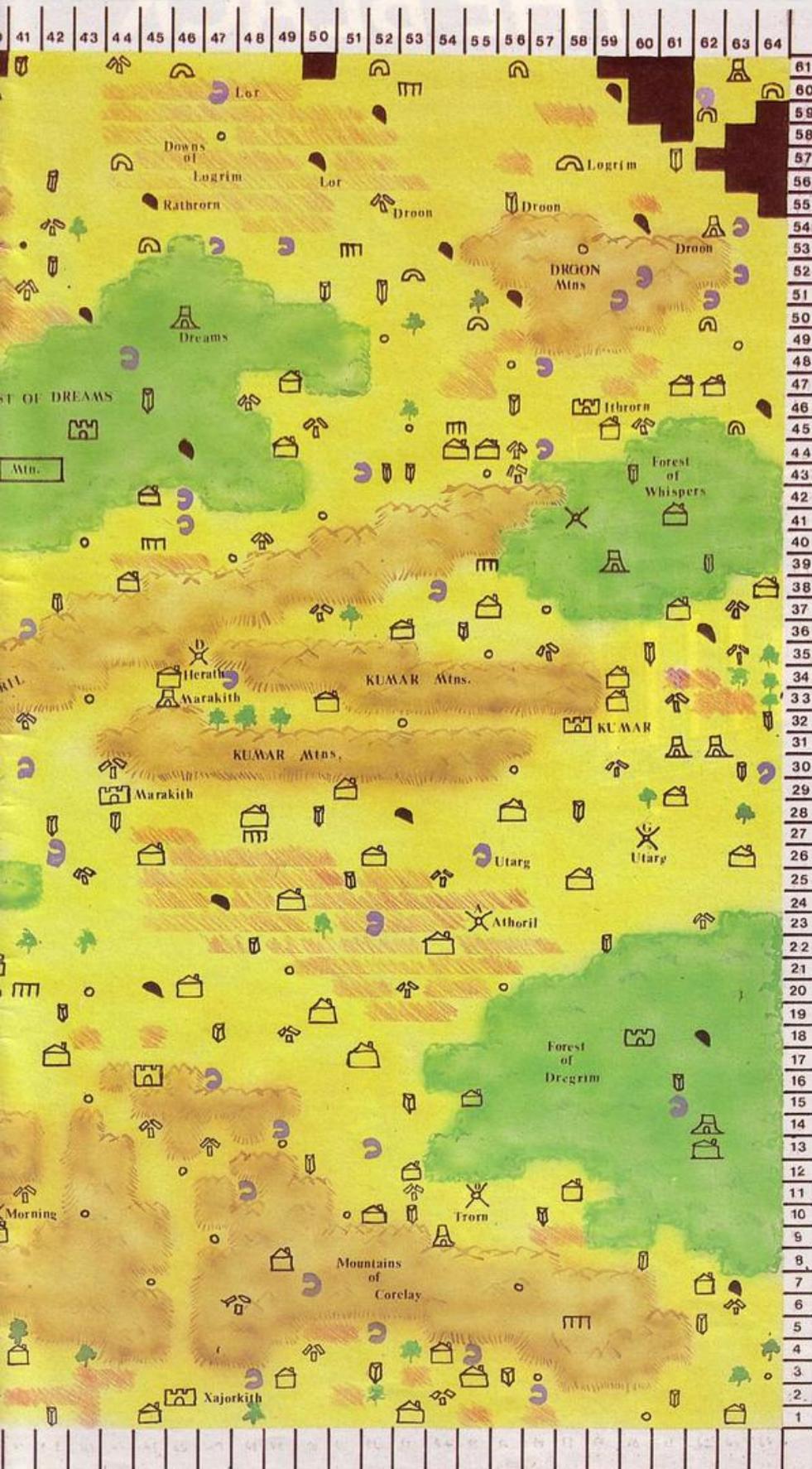
MY LEAST FAVOURITE COMPUTER GAME IS .....

NAME .....

ADDRESS .....



# OF MIDNIGHT



**T**HIS map of the **Lords of Midnight** was compiled for *Sinclair Programs* by John Rundle, and drawn by Brian Cookman.

The list below gives the names of the Lords of Midnight, the numbers of guards, warriors and riders which they command, the key which controls them, and their start location. The number of the start location refers to the grid numbers around the edges of the map.

Although a grid is not shown, the map is drawn to scale, and connecting the grid guidelines around the edge will show accurately where one area begins and another ends.

Place	Key	Lord	Gua	Warr	Ride
1321	C	Luxor	—	—	—
1321	V	Morkin	—	—	—
1321	B	Corleth	—	—	—
1321	N	Rothron	—	—	—
1106	1	Gard	600	1000	500
4429	2	Marakith	700	1000	500
4602	3	Xajorkith	750	1200	800
0961	4	Gloom	600	1000	500
2919	5	Shimeril	750	1000	800
5832	6	Kumar	600	1000	700
5846	7	Ithorn	530	195	935
4516	8	Dawn	550	800	500
4345	9	Dreams	550	1200	800
5620	0	Oregrim	500	1000	800
5523	A	Athoril	130	290	800
4635	D	Herath	60	415	430
1224	E	Shadows	—	1000	—
3015	F	Mitharg	250	600	500
6027	G	Utarg	350	—	1000
2401	I	Rorath	250	400	800
5511	O	Troran	150	800	400
4010	P	Morning	175	785	295
3401	Q	Thimrath	300	400	600
1251	R	Lothoril	200	500	200
2225	S	Blood	400	—	1200
2440	T	Korinel	—	875	—
2212	U	Brith	150	600	300
5841	W	Whispers	150	600	300
3423	Y	Thrall	—	600	300
6361	J	Logrim	—	—	—
0251	H	Fawkrin	—	—	—
1338	K	Farflame	—	—	—

	LAKE		KEEP
	CITADEL		KEEP
	VILLAGE		TOWER
	LITH		SNOW HALL
	RUIN		CAVERN

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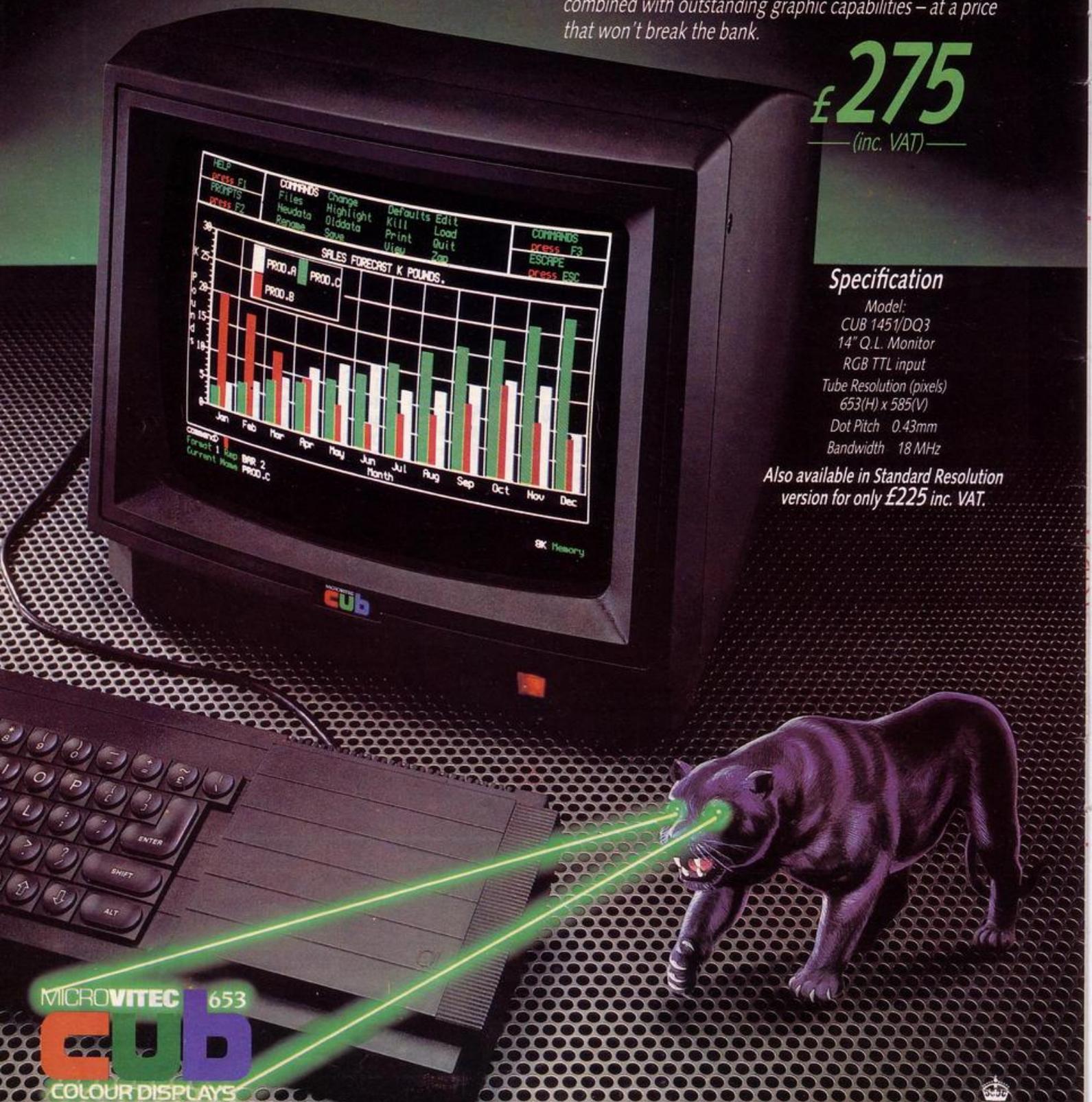
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# LEAP FROG

```

10> FOR f=USR "a" TO USR "f"
+7
20 READ a: POKE f,a: NEXT f
30 DATA 4,10,31,62,110,245,184
,110,32,80,248,124,118,175,29,11
8,0,255,255,0,52,52,52,52
40 DATA 52,52,52,52,0,126,0,25
5,0,255,51,204,0,0,0,0,24,60,126
,219,24,24,24,24

```

Listing 1

**F**ive green frogs sit on your left, five red frogs sit on the pillars on your right. For some reason, the red frogs want to sit on the left of the screen, and the green frogs want to sit on the right of the screen. Being lazy creatures they want to accomplish this in as few moves as possible.

It is only possible for frogs to jump onto an empty pillar, and they cannot jump over more than one frog at a time. How quickly can you transfer the frogs?

Leap Frog was written for any Spectrum by Joe Stanton of Cromer, Norfolk.



```

1 BORDER 0: PAPER 0: INK 7: C
LS
10 GO SUB 9000: GO SUB 50: CLS
: GO SUB 90: GO SUB 100
20 STOP
50 GO SUB 90
55 PRINT AT 3,14: BRIGHT 1:"B
y": TAB 7:"Joe Stanton @ 1985":
AT 21,14:"For":#0: BRIGHT 1:"
""SINCLAIR PROGRAMS""
60 FOR i=0 TO 7: BEEP .002;i:
PRINT AT 10,12: INK i:"Press...
"" TAB 7:"""I"" for ""INSTRUCTI
ONS"""" TAB 7:"""P"" to ""PLAY
""
65 IF INKEY#="i" THEN GO TO
1000
70 IF INKEY#="p" THEN RETURN
N
75 NEXT i: GO TO 60
95 RETURN
100 PRINT AT 10,6: BRIGHT 1: I
NK 4:"A A A A A ": INK 2:"B B
B B B": TAB 6: INK 5:"C C C C C
C C C C C C": TAB 6:"D D D D D D
D D D D D": TAB 6: INK 6:"EEEEEE
EEEEEEEEEEEEEEEE"
105 PRINT AT 14,16:"F"
110 PRINT AT 5,13:"MOVE:":mv

```

Listing 2

```

580 IF INKEY# <> "" THEN GO
TO 580
590 LET to=from: LET mv=mv+1: G
O TO 110
600 PRINT AT 18,10: INK 5: PAP
ER 3: FLASH 1:" ILLEGAL MOVE ":
AT 19,10:" TRY AGAIN "
610 FOR f=1 TO 3: FOR n=0 TO 20
STEP 2: BEEP .01,n: BEEP .01,n+
20: BEEP .01,f: NEXT n: NEXT f
620 PRINT AT 18,10:"
": TAB 10:"
":
GO TO 110
700 FOR f=0 TO 7: FOR i=0 TO f:
BEEP .01,i: PRINT AT 16,12: IN
K i:"GAME OVER": AT 18,11:"WELL
DONE": NEXT i: NEXT f
710 PRINT AT 21,5:"You did it
in ";mv;" moves":#0:"
Press Any Key": PAUSE 1: PAUSE 0:
RUN
1000 CLS : PRINT AT 2,5:"Q.....
...Move Arrow Left"" TAB 5:"W..
....Move Arrow Right"" TAB 5:"
""ENTER"".....Frog Jump"
1005 PRINT AT 10,0: INK 5:" Th
e object of the game is to move
the green frogs onto the pill

```

```

120 IF INKEY#="w" AND x<25 TH
EN PRINT AT 14,x:" ": AT 14,x+
2:"F": LET x=x+2: BEEP .01,50
130 IF INKEY#="q" AND x>6 THE
N PRINT AT 14,x:" ": AT 14,x-2
:"F": LET x=x-2: BEEP .01,50
140 IF CODE INKEY#=13 THEN
GO TO 500
150 PAUSE 0: GO TO 120
500 BEEP .02,20: LET from=(x-4)
/2
510 IF from=to THEN GO TO 600
520 IF from>to THEN IF from-to
>2 THEN GO TO 600
530 IF to-from>2 THEN GO TO 60
0
540 LET z#=a#(to): LET a#(to)=a
#(from): LET a#(from)=z#
550 LET i=4: IF a#(to)="B" THEN
LET i=2
560 PRINT AT 10,from*2+4:" ":
AT 10,to*2+4: INK i:a#(to)
570 IF a#=b# THEN GO TO 700

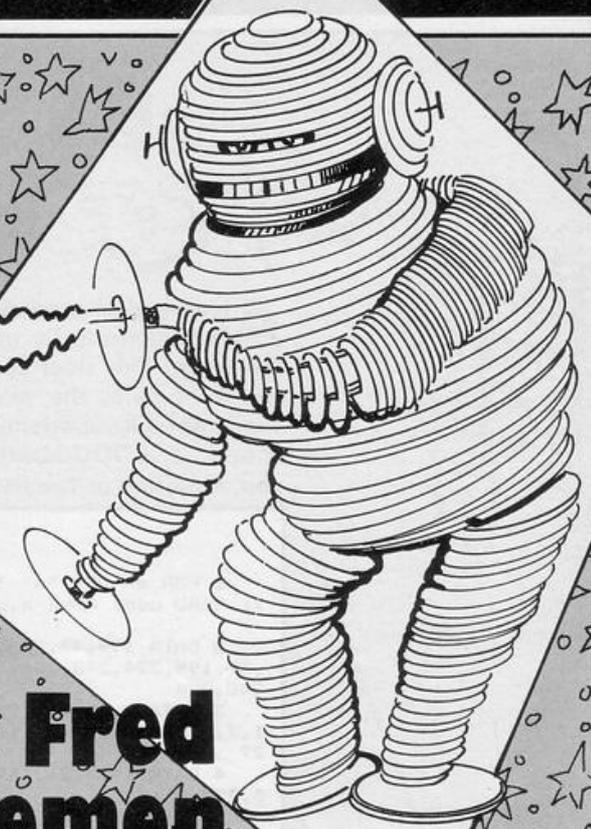
```

```

ars occupied by the red frog
s & visa versa, in as few move
s as possible."
1010 PRINT ' INK 6:" The frogs
cannot jump more than one oth
er frog at a time."
1015 PRINT ' INK 3:"When the f
rogs jump they jump onto the emp
ty pillar."
1020 PAUSE 20: PRINT #0:"
Press Any Key...": PAUSE 20: INP
UT "": IF INKEY# <> "" THEN C
LS: GO TO 10
1025 GO TO 1020
9000 LET mv=0: LET x=16: LET to=
6
9005 LET a#="AAAAA BBBBB": LET b
#="BBBBB AAAAA"
9010 RETURN
9998 SAVE "Leap Frog" LINE 9999:
SAVE "Graphics" CODE USR "a",4
8: PRINT TAB 5:"Rewind Tape - V
erifying": VERIFY "" : VERIFY ""
CODE : STOP
9999 LOAD "" CODE USR "a": RUN

```





# Knockout Fred & the Circlemen

Some games characters seem to have disasters heaped upon their heads. One such is Knockout Fred and the Circlemen. Fred is lost in a series of intergalactic tunnels. His only wish is to escape by using one of the teleport facilities on the screen. The deadly circle men appear at each side, trying to bar his way. Once he reaches the teleport Fred will find himself in another tunnel only, this time, the circle men move a little faster.

Written for the 16K ZX-81 by Neil Cottrell of Brentford, Middlesex.

Enter line one exactly as printed, and check carefully that all characters are correct, and that no spaces have been omitted before you attempt to run the program. Keywords in the middle of a line can be entered by pressing THEN, followed by the keyword. When the keyword is in place, return and delete THEN.

```

1 REM Y.#4# PRINT NOT LET 4 I
F TAN Y.#4# REM # PRINT NOT NOT NO
T LET 4 SAVE NOT NOT TAN
2 PRINT "N.O. PRODUCTION", "Y
OU ARE FRED AND YOUR AIM IS TO G
ET TO EITHER OF THE SIDES, TO
TOUCH THE ESCAPE TELEPORT #, BUT I
TS NOT THAT EASY, THERE ARE 0,3 T
RYING TO KNOCK YOU OUT, THEY C
OME IN ROWS FROM BOTH SIDES, Y
OU CAN DESTROY THEM BY SHOOTING T
HEM WITH YOUR LAZER GUNS, AS Y
OU SHOOT THEM BACK THEY KEEP C
OMEING, IF YOU MAKE IT TO THE E
XIT, YOU WILL BE TELEPORTED TO T
HE NEXT TUNEL IN WITH THE 0,3 A
RE FASTER, EACH TIME YOU MAKE IT
THEY COME FASTER UNTIL THEY K
NOCK YOU OUT, ONCE THEY GET TO A
CERTAIN SPEED THEY GO BACK TO S
TARTING SPEED, THEY HAVE TO HIT Y
OU ON THE BONCE TO BOP YOU"
3 PRINT "YOU HAVE THREE LIVES
SCORE ONE EACH TIME YOU GET TE
LEPORTED"
4 POKE 16418,0
5 PRINT "CONTROLS... 1=LEFT 2
=RIGHT 3=FIRE LEFT 0=FIRE R
IGHT", "PRESS ANY KEY" "GOOD LUCK
"
6 IF INKEY#="" THEN GOTO 6
7 OL6
10 LET H#=#0
20 LET G#=#0
30 LET I#=#.8
40 LET L#=#3
50 LET D#=#1
60 LET D#=#1
70 LET D#=#15
80 LET D#=#13
90 LET N#=#31
00 LET X#=#0
100 PRINT AT 0,0
200 IF USR 1652 THEN
300 PRINT AT 0,0;"LIVES";L;AT
400;" ";AT 17,20;" ";AT 21,0;"S
500 SCORE";S
600 PRINT AT .,0;

```

```

90 IF USR 16514 OR USR 16514 T
HEN
100 FOR N=0 TO 14
110 PRINT AT N,B;" ";TAB B;"
";TAB B;"
115 NEXT N
120 PRINT AT A,B;" ";TAB B;
";AT 15,0;A#;AT 15,Z;B#
130 IF B=26 OR B=1 THEN GOTO 60
136 IF X=B+4 OR X=B+3 OR Z=B+2
OR Z=B+3 THEN GOTO 300
140 LET W=AND
150 IF W>H THEN LET A#=#A#+"0"
155 IF W>H THEN LET X=X+1
160 IF W>H THEN LET B#=#B#+"0"
170 IF W>H THEN LET Z=Z-1
180 LET B=B+(INKEY#="2")-(INKEY
#="1")
181 IF INKEY#="0" THEN GOTO 500
185 IF INKEY#="9" THEN GOTO 400
200 GOTO 120
300 LET L=L-1
310 IF L<>0 THEN GOTO 25
315 IF H<3 THEN LET H#=#3
320 PRINT AT 10,20;"GAME OVER";
TAB 0;"HIGH SCORE";H#
330 PAUSE 4E4
340 GOTO 20
400 IF X=0 THEN GOTO 190
410 PRINT AT A,X-1;" ";AT A,X-1
"
415 LET X=X-1
420 LET A#=#A#( TO LEN A#-1)
430 GOTO 120
500 IF Z=31 THEN GOTO 190
505 PRINT AT A,Z;" ";AT A,Z;" "
510 LET Z=Z+1
520 LET B#=#B#( TO LEN B#-1)
530 GOTO 120
600 LET H=H-.05
605 IF H=0.2 THEN LET H=.8
610 LET S=S+1
620 PRINT AT 21,0;"YOU MADE IT
NEXT NEXT LEVEL"
625 PAUSE 100
630 GOTO 25
9000 SAVE "KNOCKOUT FRED"
9990 RUN

```

# FISH BLAST

A tranquil afternoon in summer. Fish swim lazily up and down the river. The river is a beautiful shade of blue, the sky a delicate shade of pink. Suddenly the silence is broken. BOOOOOM!!! Yes, it is you, shooting at the fish. You have

thirty bullets, and are determined to hit as many fish as possible. Move left with Q, right with W, and fire with P.

Fish Blast was written for the Spectrum by Martin Walker of Rugeley, Staffordshire.

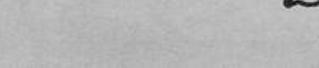
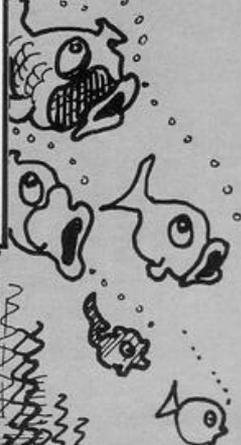
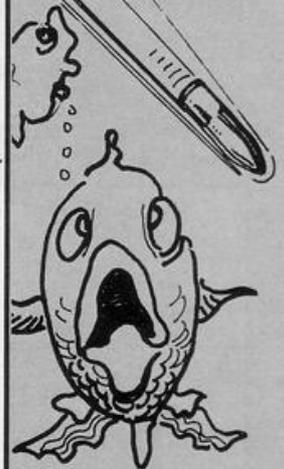
```

1 FOR a=USR "a" TO USR "q"+
7: READ udg: POKE a,udg: NEXT a

2 DATA 199,47,223,187,124,223
,47,199,224,248,206,151,207,254,
248,224
3 DATA 7,31,115,233,243,127,3
1,7,227,244,251,221,62,251,244,2
27
4 DATA 1,17,21,149,183,191,25
5,255
5 DATA 254,198,192,240,192,19
2,192,192,126,24,24,24,24,24,24,
126,124,198,192,124,6,6,198,124,
198,198,198,254,198,198,198,198

6 DATA 252,198,198,252,198,19
8,198,252,192,192,192,192,192,19
2,198,254,124,198,198,254,198,19
8,198,198,126,24,24,24,24,24,24,
24
7 DATA 36,36,129,165,16,0,74,
98,146,73,36,146,73,36,146,73
8 DATA 73,146,36,73,146,36,73
,146
9 DATA 219,231,219,102,102,60
,60,24
10 LET hi=0
20 LET a$="          AB
"
30 LET b$="          CD
"
50 LET d$="          "
"
60 LET po=15
70 LET Bullets=0
80 LET score=0
90 BRIGHT 1: BORDER 5: PAPER 1
: INK 7: CLS
95 PRINT #0; AT 0,0; PAPER 2;
BRIGHT 1;"
"
96 PRINT #1; PAPER 2; INK 7; B
RIGHT 1;" BY Martin Walker. 1
984. "
100 FOR a=0 TO 31: PRINT INK 2
; AT 19,a;"E"; AT 20,a;"■"; AT 2
1,a;"■": NEXT a
110 FOR a=0 TO 31: PRINT PAPER
5; BRIGHT 0; AT 0,a;" "; AT 1,a
;" ": NEXT a
120 PRINT AT 0,11; BRIGHT 0; P
APER 5; INK 1;"FGHI JKLMH"
130 PRINT PAPER 3; AT 2,0;d$;
AT 3,0;d$; AT 4,0;d$
150 PRINT PAPER 3; INK 7; AT 4
,po;" Q " : IF bullets>30 THEN G
O TO 700
155 PRINT PAPER 2; INK 7; BRIG
HT 1; AT 21,7;"BULLETS USED = ";
bullets
160 IF INKEY$ ="q" AND po>0 TH
EN LET po=po-1
170 IF INKEY$ ="w" AND po<29 T
HEN LET po=po+1
180 IF INKEY$ ="p" THEN BEEP
.005,5: BEEP .005,10: LET bullet
s=bullets+1: GO TO 500
185 PRINT PAPER 2; INK 7; BRIG
HT 1; AT 21,7;"BULLETS USED = ";
bullets
190 PRINT INK 5; AT 17,0;a$
200 PRINT INK 3; AT 14,0;b$
210 LET a$=a$(31)+a$( TO 31)
220 LET b$=b$(2 TO )+b$(1)
230 GO TO 150
500 FOR g=5 TO 18
510 PRINT INK 6; AT g,po+1;"N"
"
520 IF SCREEN$(g,po) <> " " T
HEN GO TO 600
530 PRINT AT g,po+1;" "
540 PRINT INK 5; AT 17,0;a$; I
NK 3; AT 14,0;b$
550 LET a$=a$(31)+a$( TO 31): L
ET b$=b$(2 TO )+b$(1)
560 BEEP .0010,60: NEXT g
570 GO TO 150
600 PRINT AT 3,1; FLASH 1;"HIT
": FOR p=0 TO 3; FOR h=0 TO 7: P
RINT INK h; AT g,po;"DP"; AT g+
1,po;"PO": PRINT INK h; AT g,po
;"PO"; AT g+1,po;"DP": BEEP .008
,p: NEXT h: NEXT p: PRINT BRIGH
T 1; PAPER 3; FLASH 0; AT 3,1;"
"
610 LET score=score+50
620 PRINT AT g,po;" "; AT g+1
,po;" ": GO TO 150
700 BRIGHT 1: PAPER 0: BORDER 0
: INK 7: CLS
710 PRINT AT 0,4;"Your Final S
core Was ";score
720 IF score>hi THEN LET hi=sc
ore
730 PRINT AT 2,3;"Your High Sc
ore So Far ";hi
740 PRINT INK RND *6+1; AT 6,
6;"Another Game (Y/N)"
750 IF INKEY$ ="y" THEN GO TO
60
760 IF INKEY$ ="n" THEN BRIGH
T 0: INK 0: PAPER 7: BORDER 7: C
LS : LIST
770 BEEP .005, RND *60+1: GO TO
740

```



# ANSWER THE PHONE



The phone is ringing on the other side of the screen. All you have to do is Answer the Phone. Simple? Well, not really. Your dog has chewed holes in the floor, and a TV repair man has dropped live cables into them, so if you fall into any of the holes you will be electrocuted.

Written for the 16K ZX-81 by C Shingles of Halesowen, West Midlands.

```

1 LET X=0
2 LET PA=0
3 LET SC=0
4 LET K=0
5 LET LEV=1
10 CLS
11 PRINT "          ANSWER THE P
HONE"
12 PRINT
13 PRINT "          INSTRUCTIO
NS"
15 PRINT "ALL YOU DO IS ANSW
ER THE PHONE. EASY? NO, YOU SEE Y
OUR DOG HAS CHEWED HOLES IN TH
E FLOOR AND A T.V. REPAIR MAN DR
OPPED LIVE WIRES IN."
16 PRINT "SO YOU MUST JUMP O
VER THE HOLES OR BE ELECTICUTED.
OH, YES IF A HOLE IS TO LONG YO
U WILL NEED A HYPER-JUMP, OF WHIC
H YOU HAVE 1 PER LEVEL.....GOO
D LUCK....."
20 PRINT "          KEYS"

30 PRINT "(X)-RIGHT
(J)-JUMP
(H)-HYPER-JUMP"
35 PRINT AT 21,0;"PRESS AN"
40 IF INKEY$="" THEN GOTO 40
50 CLS
60 LET A=INT (RND*22)+3
70 LET S=INT (RND*22)+3
80 LET D=INT (RND*22)+3
90 LET F=INT (RND*22)+3
100 LET G=INT (RND*22)+3
110 PRINT AT 9,0;

120 FOR F=10 TO 20
130 PRINT AT F,0;

140 NEXT F
141 PRINT AT 0,0;"SCORE=";SC
145 PRINT AT 5,26;

150 IF LEV>=1 THEN PRINT AT 9,A
155 IF LEV>=2 THEN PRINT AT 9,S
160 IF LEV>=3 THEN PRINT AT 9,D
165 IF LEV>=4 THEN PRINT AT 9,F
170 IF LEV>=5 THEN PRINT AT 9,G

199 REM ***MOVE***
200 PRINT AT 8,X;"$";AT 8,X;" "
210 IF INKEY$="X" THEN LET X=X+
1
211 IF INKEY$="X" THEN LET SC=5
C+10
220 IF INKEY$="J" THEN GOTO 300
230 IF INKEY$="H" THEN GOTO 350
231 IF X=A AND LEV>=1 THEN GOTO
600
232 IF X=S AND LEV>=2 THEN GOTO
600
233 IF X=D AND LEV>=3 THEN GOTO
600
234 IF X=F AND LEV>=4 THEN GOTO
600
235 IF X=G AND LEV>=5 THEN GOTO
600
240 IF X>=26 THEN GOTO 1000
250 GOTO 200
300 PRINT AT 7,X+1;"$";AT 7,X+1
305 PRINT AT 8,X+2;"$";AT 8,X+2

320 LET X=X+2
330 GOTO 200
350 IF K=1 THEN GOTO 390

```

```

355 PRINT AT 7,X+1;"$";AT 7,X+1
360 PRINT AT 7,X+2;"$";AT 7,X+2

370 LET X=X+3
380 LET K=K+1
385 LET SC=SC-100
390 GOTO 200
600 FOR F=8 TO 10
610 PRINT AT F,X;" "
620 NEXT F
630 FOR F=1 TO 40
640 PRINT AT 10,X;"$";AT 10,X;"
E"
650 NEXT F
660 CLS
700 PRINT AT 10,0;"YOU ANSWERED
";PA;" PHONES ";AT 12,0;" AND S
CORED ".SC
710 PRINT "PRESS A KEY TO REPLA
Y"
720 IF INKEY$="" THEN GOTO 720
730 GOTO 1
800 STOP
1000 CLS
1001 LET U=INT (RND*3)+1
1005 IF U=1 THEN LET US="YOUR MO
M"
1010 IF U=2 THEN LET US="THE BAN
K MANAGER."
1015 IF U=3 THEN LET US="A DOG-F
ISH"
1020 IF U=3 THEN LET US="YOUR FR
IEND."
1025 LET Y=INT (RND*2)+1
1030 IF Y=1 THEN LET YS="WANTING
YOU TO COME OUT TO PLAY."
1035 IF Y=2 THEN LET YS="ASKING
TO BORROW A FIVER."
1040 IF Y=3 THEN LET YS="CALLING
TO SAY HELLO."
1100 PRINT AT 10,0;" ITS ";US;AT
12,0;Y$
1120 FOR F=1 TO 100
1130 NEXT F
1140 LET LEV=LEV+1
1200 LET SC=SC+100
1300 LET X=0
1400 LET PA=PA+1
1450 LET K=0
1500 GOTO 50
2001 SAVE "PHONE"
2002 RUN

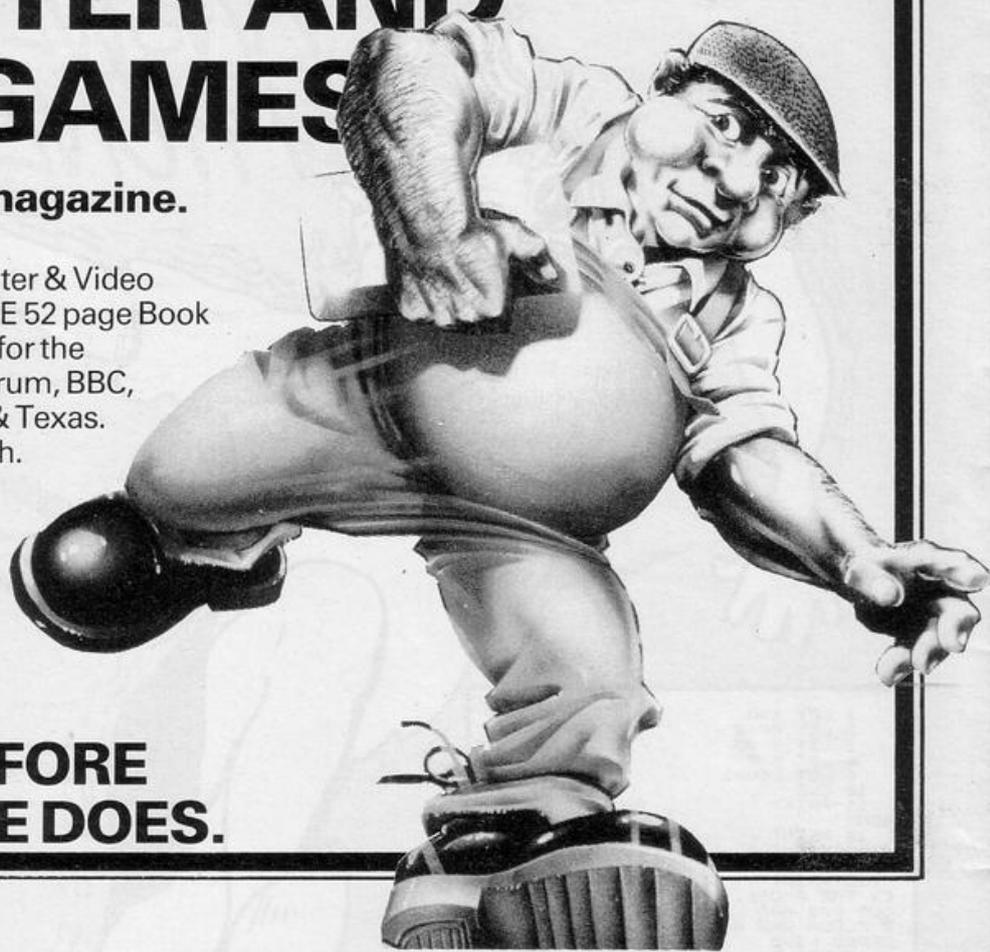
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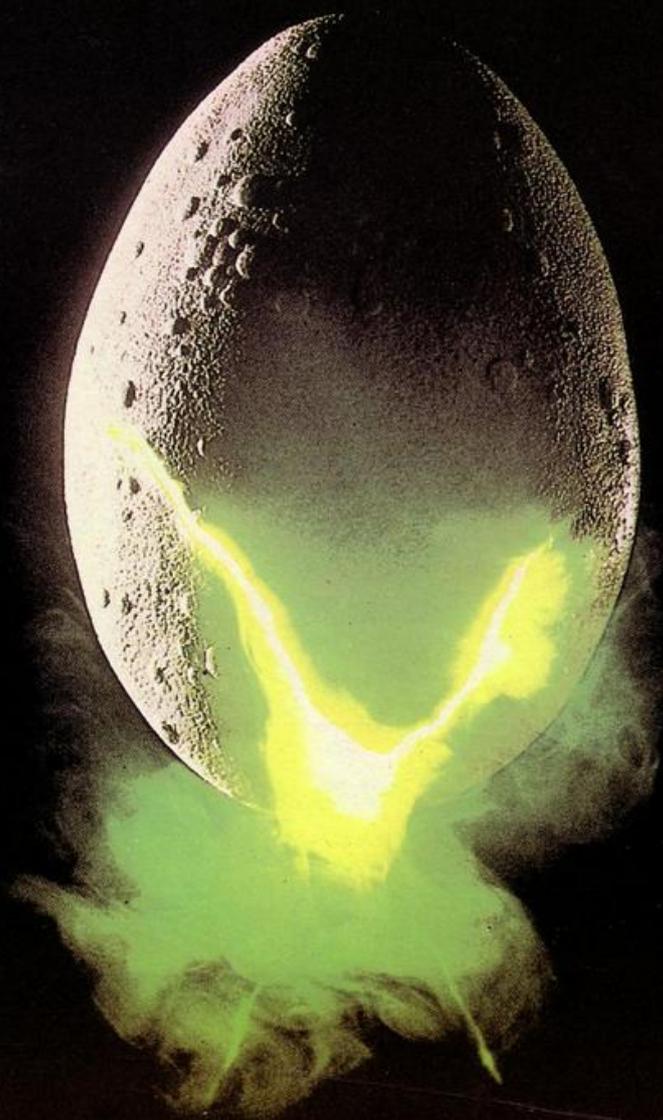
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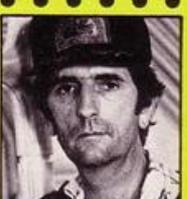
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