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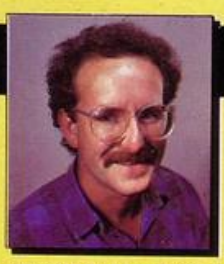

DEVISED BY IAN LIVINGSTONE

The storylines for "Eureka!" are by Ian Livingstone, whose "Fighting Fantasy" books have sold over 2,000,000 copies. He's dreamed up some rather nasty tricks and twists for you in this Epic, because he has also devised the cryptic clues and conundrums in the booklet that goes with the program. He's the one who knows the answers.

"Eureka!" was programmed by Andromeda teams led by Hungarians Donát Kiss and András Császár. It took the equivalent of 5 YEARS to create, and the skills of 4 graphic artists, 2 musicians and a professor of logic too. We told them to stretch the hardware's capabilities, and make sure you were kept awake for hours!! They've done it...

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Subscription manager
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Publisher
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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.

Inverse characters are represented by the letter "i" and graphics characters by "g". 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 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 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 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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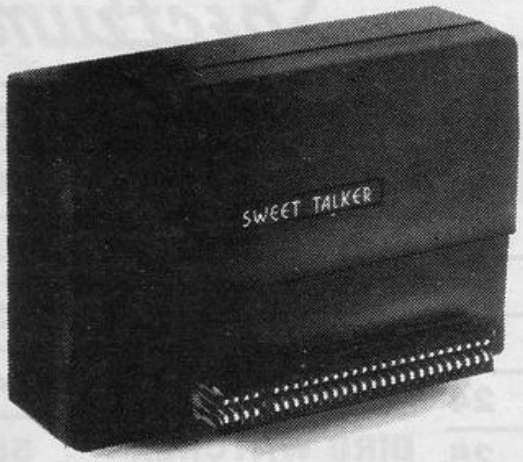

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GOLD MAZE

ONE hundredth of the maze is shown in the centre of the screen. The exit is not visible so you must work your way round the maze trying to escape. Gold bars are scattered around the maze and these should be collected to gain points. There is one setback which is that there are also several bars of fool's gold which cannot be distinguished from the real gold bars. If you pick up a bar of fool's gold it will reduce your score by five points. Ten points can be gained for each bar of gold collected.

Gold Maze was written for the 48K Spectrum by 14 year old Tim Smith of Doveridge, Derbyshire who took six hours to write the program.

Lines	Function
1- 520:	Set-up Maze (SETUP)
530- 700:	Prog Control (MAIN)
1000-1060:	Get "gold" (GOLD)
1500-1570:	Get "Fools Gold" (FOOL)
2000-2050:	End game on "exit" (EXIT)
2500-2560:	End game on "abort" (ABORT)
3000-3050:	Play "win tune" (TUNE1) Play "lose tune" (TUNE2)

Tim Smith.

5000-5100: Print logo (LOGO)
8000-8240: Print Instructions (INSTRUCT)
9000-9070: Save routine
9500-9510: Load routine

Variables

a$ (50,50): Maze graphics
x,y: Current coords.
a,b: Previous coords.
g: Score
d,p,: duration/pitch (for BEEP)

UDG's

ga: Gold nugget
gb: Fools gold
go: YOU
gd: "WINDOW" SURROUND
ge-gl: "GOLDMAZE"
gm,gn: "EXIT"

Loop counters: a

How it works

The module names suggest in the program summary have been used to describe how the program works. These names have no programming significance.

SETUP (Lines 1-520)
Set up maze in array a$, clear screen, set colours call LOGO, call INSTRUCT. Set score to ZERO. Initialise coords x,y to start at middle of maze.

LOGO (Lines 5000-5100)
Repeat. Play "Rich Man". Print title. Scan keyboard. Until Start Key. Return.

INSTRUCT (Line 8000-8240)
Clear Screen. Print instructions. Clear screen. Clear screen. Print sample maze "window". Clear screen. Print window surrounds and "black out" window.

MAIN (Lines 530-700)
Hold "old" x,y as a,b
x=x+(Key=a)-(Key=q)
y=y+(Key=m)-(Key=n)
IF Key=0 THEN call ABORT. IF a$ (x,y)=wall THEN re-set x,y to "old" values (a,b). Print 5*5 character maze window initially a$ (23-27,24-28) Print go (YOU at window centre). IF a$ (x,y)=gb (gold) THEN CALL GOLD. IF a$ (s,y)=go (fools gold) THEN CALL FOOL. IF a$ (x,y)=gm or gn (exit found) THEN CALL EXIT. Print Score. Jump to MAIN.

GOLD (Lines 1000-1060)
Print "GOLD" message (with BEEPS). Take nugget out of maze set a$(x,y)=" ". Increase score. Erase "GOLD". Return.

FOOL (Lines 1500-1570)
Print "FOOLS GOLD!" (with BEEPS). Take nugget out of maze. Reduce score by 5. Erase "FOOLS GOLD". RETURN.

EXIT (Lines 2000-2050)
Clear Screen. Print exit message/score. Call TUNE1. Repeat. Scan keyboard. IF N pressed THEN stop until Y pressed RUN.

ABORT (Lines 2500-2560)
Clear screen. Print abort message/score. Call TUNE2. Repeat. Scan keyboard. IF N pressed THEN stop until Y pressed RUN.

The main principle

The author has cleverly arranged the program only to allow the player a "peep" at the maze through a 5 by 5 character "window" (showing only 1% of total maze).

The first view is of the section of the maze array a$ (x,y) with x from 23 to 27 and y from 24 to 28. This view (and all subsequent views) is repeatedly printed by the loop around MAIN, until any of the control keys are pressed. Direction keys, in effect, shift the window (not you) by 1 character left/right or up/down for each pass through the MAIN loop.

Before the window can be shifted a check must be made to make sure that you are not in a wall (line 560). If you are, then previous coordinates (for central character of window, which is also where you are) are restored. Otherwise, the shift is made, followed by checks on gold etc.

```
  3 REM        EFGHIJKL
 10 DIM a$(50,50)
 20 LET a$(1)="(50*ig8)"
 30 LET a$(2)="(50*ig8)"
 40 LET a$(3)="(2*ig8)MN(ig8:3*
sp:(ig8)B(4*sp:8*ig8:sp)AAA(ig8:
sp:2*ig8:3*sp:ig8:3*sp:ig8:10*sp
:2*ig8)"
 50 LET a$(4)="(2*ig8:2*sp:ig8:
sp:ig8:sp:5*ig8:8*sp:ig8:sp:4*ig
8:sp:2*ig8:sp:ig8:sp:ig8:sp:ig8:
sp:ig8:sp:8*ig8:sp:2*ig8)"
 60 LET a$(5)="(2*ig8:sp)A(ig8:
sp:ig8:sp:ig8:5*sp:6*ig8:sp:ig8:
6*sp:2*ig8:sp:ig8:sp:ig8:sp:ig8:
sp:ig8:sp:ig8:6*sp:ig8:sp:2*ig8)
"
 70 LET a$(6)="(2*ig8:2*sp:ig8:
```

```
sp:ig8:3*sp:ig8:2*sp:5*ig8:3*sp:
ig8:sp:4*ig8:sp:2*ig8:sp:ig8:3*s
p:ig8:3*sp:ig8:sp:4*ig8:sp:ig8:s
p:2*ig8)"
  80 LET a$(7)="(2*ig8)A(3*sp:6*
g8:sp:ig8:3*sp:ig8:sp:3*ig8:sp:4
*ig8:sp:2*ig8:sp:7*ig8:sp:ig8:sp
:4*ig8:sp:ig8:sp:2*ig8)"
  90 LET a$(8)="(7*ig8:2*sp)A(sp
:ig8:sp:ig8:sp:ig8:sp:ig8:5*sp:i
g8:2*sp:ig8:sp:2*ig8:sp:ig8:5*sp
:ig8:sp:ig8:3*sp:ig8)B(sp:ig8:sp
:2*ig8)"
 100 LET a$(9)="(2*ig8:sp:ig9:sp
:2*ig8:sp:4*ig8:sp:ig8:sp:ig8:sp
:8*ig8:3*sp:ig8:2*sp:ig8:sp:3*ig
8:sp:ig8:sp:3*ig8:sp:4*ig8:sp:2*
ig8)"
 110 LET a$(10)="(2*ig8:sp:ig8:2
*sp:ig8:sp:ig8:4*sp:ig8:sp:ig8:s
p:ig8:sp:ig8:4*sp:3*ig8:sp:ig8:s
p:2*ig8:2*sp:ig8:2*sp:ig8)B(2*sp
:ig8:2*sp)A(3*sp:2*ig8)"
 120 LET a$(11)="(2*ig8:sp:2*ig8
:sp:ig8)B(ig8:sp:4*ig8:sp:ig8:sp
:ig8:sp:4*ig8:3*sp:ig8:sp)A(sp:3
*ig8:sp:ig8:sp:4*ig8:sp:9*ig8)"
 130 LET a$(12)="(2*ig8)A(ig8:8*
sp:ig8:2*sp:ig8:sp:ig8:sp:ig8:2*
sp:3*ig8)A(3*ig8)B(2*sp:ig8:sp:i
g8:4*sp:ig8:sp:ig8:6*sp:2*ig8)"
 140 LET a$(13)="(2*ig8:sp:ig8:s
p:8*ig8:sp:2*ig8:sp:ig8:sp)A(sp:
2*ig8:sp:ig8:3*sp:3*ig8:sp:ig8:s
p:4*ig8:sp:ig8:sp:ig8:sp:4*ig8:s
p:2*ig8)"
 150 LET a$(14)="(2*ig8:sp:ig8:s
p:ig8:3*sp:ig8:2*sp:ig8:sp:ig8)B
A(ig8:sp:4*ig8:sp:3*ig8:5*sp:ig8
:sp:ig8:4*sp:ig8:5*sp:5*ig8)"
 160 LET a$(15)="(2*ig8:sp:ig8:s
p:ig8:sp:ig8:sp:ig8)B(2*ig8:sp:i
g8)B(2*ig8:7*sp:8*ig8:sp:ig8:sp:
ig8:sp:6*ig8:4*sp:2*ig8)"
 170 LET a$(16)="(2*ig8:sp:ig8:s
p:ig8:sp:ig8:sp:ig8:sp:ig8:2*sp:
ig8)BA(7*ig8:sp:ig8:3*sp:ig8)B(3
*sp:ig8:sp:ig8:2*sp:ig8:3*sp:ig8
:sp:2*ig8:sp:2*ig8)"
 180 LET a$(17)="(2*ig8:3*sp:ig8
:sp:ig8:3*sp:ig8:sp:3*ig8)A(ig8)
B(4*sp:ig8:3*sp:ig8:sp:ig8:sp:4*
ig8:sp:2*ig8:sp:ig8:sp:ig8)B(ig8
:4*sp:2*ig8)"
 190 LET a$(18)="(4*ig8:sp:ig8:s
p:ig8:sp:3*ig8:3*sp:3*ig8:sp:ig8
:sp:ig8:sp:5*ig8:sp:ig8:sp:ig8:4
*sp:ig8:2*sp:ig8:sp:3*ig8:sp:ig8
:sp:3*ig8)"
 200 LET a$(19)="(4*ig8:sp:ig8:s
p:ig8:sp:5*ig8:5*sp:ig8:sp:ig8:2
*sp:ig8:4*sp:ig8:sp:ig8:sp:4*ig8
:sp:2*ig8:3*sp)B(sp:ig8:2*sp:2*i
g8)"
 210 LET a$(20)="(2*ig8:sp:ig8:s
p:ig8:sp:ig8:5*sp:4*ig8:sp:2*ig8
:sp:2*ig8:sp:ig8:sp:4*ig8:sp:ig8
:2*sp)B(2*ig8:2*sp:ig8:sp:3*ig8:
sp:2*ig8:sp:2*ig8)"
 220 LET a$(21)="(2*ig8:sp:9*ig8
:sp:ig8:4*sp:2*ig8:sp:2*ig8:sp:i
g8:sp)B(ig8:3*sp:3*ig8:sp:3*ig8:
sp:ig8:3*sp:ig8:sp:5*ig8)"
 230 LET a$(22)="(2*ig8:9*sp:ig8
:sp:ig8:sp:2*ig8)A(4*ig8:2*sp:2*
ig8:sp:3*ig8:3*sp:ig8:sp:ig8:sp:
ig8:sp:3*ig8:sp:ig8:4*sp:2*ig8)"
 240 LET a$(23)="(3*ig8:sp:3*ig8
:sp:2*ig8:sp:ig8:sp:ig8:sp:ig8:2
*sp:ig8:4*sp:3*ig8:sp:ig8:sp:3*i
g8:sp:ig8:sp:ig8:sp:ig8:sp:ig8:3
*sp:ig8:sp:2*ig8:sp:2*ig8)"
 250 LET a$(24)="(2*ig8:2*sp:ig8
:sp:ig8:sp:2*ig8:sp:ig8:sp:ig8:s
p:ig8:sp:2*ig8:sp:4*ig8:3*sp:ig8
:5*sp:ig8:sp:ig8:3*sp:ig8:sp:3*i
g8:2*sp:ig8:sp:2*ig8)"
 260 LET a$(25)="(2*ig8:sp:2*ig8
:sp:ig8:sp:ig8:2*sp:ig8:3*sp:ig8
:2*sp:ig8:sp:ig8:sp)B(4*sp:5*ig8
)A(ig8:sp:ig8:sp:3*ig8:3*sp:2*ig
8:sp:ig8:sp:2*ig8)"
 270 LET a$(26)="(2*ig8:sp:2*ig8
:sp:ig8:Sp:9*ig8:sp:ig8:sp:ig8:s
p:2*ig8:3*sp)B(sp:3*ig8)B(ig8:sp
:ig8:sp:4*ig8:sp:3*ig8:sp:4*ig8)
"
 280 LET a$(27)="(2*ig8:sp:2*ig8
:10*sp:ig8:2*sp:ig8:4*sp:2*ig8:s
p:2*ig8:2*sp:2*ig8)B(ig8)B(ig8:2
*sp:ig8:3*sp:ig8:5*sp:2*ig8)"
 290 LET a$(28)="2*ig8:2*sp:10*i
g8:sp:ig8)B(5*ig8:2*sp:ig8:sp:3*
ig8:2*sp:ig8)A(4*ig8:sp:ig8:sp:3
*ig8:sp:3*ig8:sp:2*ig8)"
 300 LET a$(29)="(2*ig8:sp:2*ig8
:3*sp:ig8:sp:ig8:2*sp:ig8:sp:8*i
g8:sp:ig8:sp:4*ig8)B(ig8:3*sp:ig
8:2*sp:ig8:3*sp:ig8:sp)A(ig8:2*s
p:2*ig8)"
 310 LET a$(30)="(2*ig8:sp:ig8:2
*sp:ig8:sp:ig8:sp:ig8:sp:2*ig8:4
*sp)A(2*ig8:3*sp:ig8:sp:4*ig8:sp
:3*ig8:sp:ig8:sp:2*ig8:sp:ig8:sp
:4*ig8:sp:3*ig8)"
 320 LET a$(31)="(2*ig8:sp:ig8:s
p:2*ig8:sp:ig8:sp:ig8:3*sp)B(3*i
g8:sp:ig8:2*sp:ig8:sp:ig8:sp:ig8
:2*sp:ig8:3*sp:ig8:sp:ig8:2*sp:8
*ig8:sp:3*ig8)"
 330 LET a$(32)="(2*ig8:sp:ig8:s
p:2*ig8:sp:ig8:sp:4*ig8:sp:ig8:s
p:ig8)B(ig8:sp:2*ig8:sp:ig8:sp:i
g8:sp:4*ig8:sp:ig8:sp:5*ig8:7*sp
:3*ig8)"
 340 LET a$(33)="(2*ig8:3*sp:2*i
g8:sp)A(sp:ig8:2*sp:ig8:sp:ig8:3
*sp:ig8:2*sp:ig8:sp:ig8:sp:ig8:4
*sp:ig8:3*sp:5*ig8:sp:ig8)A(3*ig
8)A(3*ig8)"
 350 LET a$(34)="(7*ig8:sp:4*ig8
:sp:ig8:sp:6*ig8:sp:ig8:sp:ig8:s
p:4*ig8:sp:5*ig8:3*sp:ig8:sp:ig9
8:sp:ig8:sp:ig8:2*sp:2*ig8)"
 360 LET a$(35)="(2*ig8:11*sp:ig
8:2*sp)A(3*sp:ig8:sp:3*ig8:sp:ig
8:4*sp:ig8:5*sp:ig8:3*sp:ig8:sp:
ig8)A(5*ig8)"
 370 LET a$(36)="(5*ig8:sp:8*ig8
:sp:4*ig8:sp:ig8:sp:ig8)B(ig8:sp
:ig8:sp:4*ig8:sp:2*ig8)B(6*ig8:s
p:ig8:4*sp:2*ig8)"
 380 LET a$(37)="(5*ig8:sp:ig8:3
*sp:ig8:2*sp:ig8:sp:2*ig8:sp:ig8
:sp:ig8:3*sp:ig8:sp:ig8:3*sp:ig8
:2*sp:ig8:2*sp:4*ig8:sp:ig8:sp:4
*ig8:sp:2*ig8)"
 390 LET a$(38)="(2*ig8:4*sp:ig8
:sp:ig8:3*sp:2*ig8:sp:2*ig8:sp:i
g8:sp:ig8:sp:ig8:sp:ig8:sp:3*ig8
:sp:ig8:sp:6*ig8:sp:ig8:sp:ig8:s
p:ig8:4*sp:2*ig8)"
 400 LET a$(39)="(2*ig8:sp:2*ig8
:3*sp:ig8:sp:4*ig8:sp:ig8:4*sp:i
g8:sp:ig8)B(ig8:3*sp:ig8:sp:ig8:
2*sp:ig8:3*sp:ig8:sp:ig8:sp:ig8:
sp:ig8:sp:5*ig8)"
 410 LET a$(40)="(2*ig8:2*sp:8*i
g8:sp:ig8:sp:ig8:sp:10*ig8:sp:ig
8:sp:2*ig8:3*sp:ig8:sp:ig8:5*sp:
ig8)B(3*sp:2*ig8)"
 420 LET a$(41)="(3*ig8:3*sp:ig8
:sp:ig8:2*sp:ig8:sp:ig8:sp:4*ig8
:7*sp:ig8:3*sp:6*ig8:sp:ig8:sp:8
*ig8:sp:2*ig8)"
```

continued on page 8

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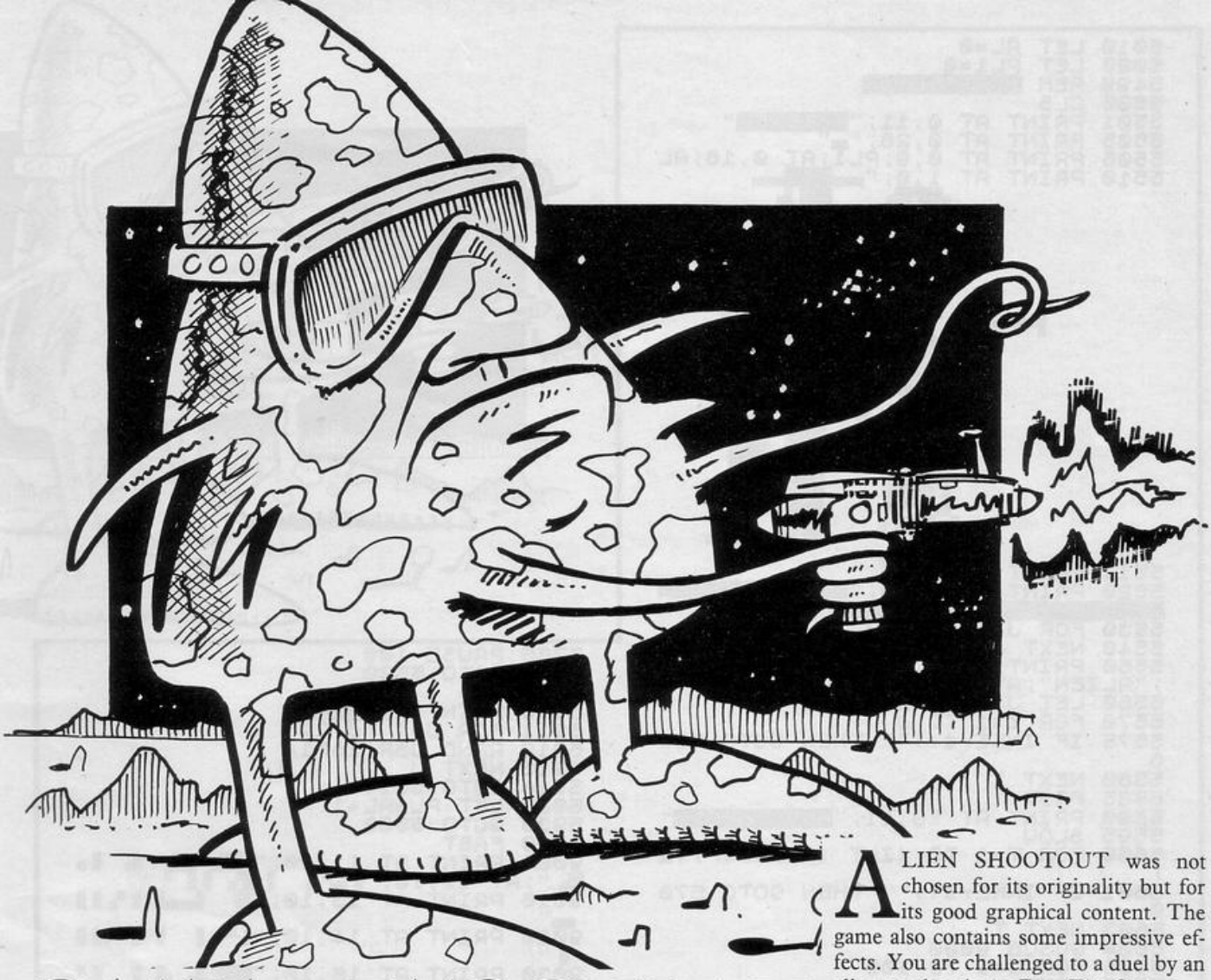
continued from page 6

```
 430 LET a$(42)="(5*ig8:sp:ig8:s
p:ig8:sp:2*ig8:3*sp)B(4*sp:5*ig8
:3*sp:3*ig8:4*sp:ig8:sp:ig8:sp:i
g8:3*sp:ig8:4*sp:2*ig8)"
 440 LET a$(43)="(2*ig8)B(2*ig8:
sp:ig8:sp:ig8:sp:4*ig8:sp:6*ig8:
3*sp:6*ig8:2*sp:2*ig8:sp:ig8:sp:
3*ig8:sp:ig8:sp:ig8:sp:5*ig8)"
 450 LET a$(44)="(2*ig8:2*sp:ig8
:sp:ig8:8*sp:ig8:4*sp:ig8:sp:ig8
:sp:ig8)BBB(3*sp:2*ig8:8*sp:ig8:
sp:ig8:4*sp:2*ig8)"
 460 LET a$(45)="(3*ig8:sp:ig8:s
p:10*ig8:sp:2*ig8:sp:ig8:sp:ig8:
sp:5*ig8:sp:2*ig8:2*sp:2*ig8:sp:
3*ig8:sp:ig8:sp:7*ig8)"
 470 LET a$(46)="(2*ig8:4*sp:ig8
:3*sp:ig8:3*sp:ig8:3*sp:ig8:3*sp
:ig8:sp:ig8:3*sp:3*ig8:2*sp:2*ig
8:2*sp:ig8:3*sp:ig8:sp:ig8:4*sp:
2*ig8)"
 480 LET a$(47)="(2*ig8:sp:4*ig8
:sp:ig8:sp:ig8:sp:ig8:sp:ig8:sp:
ig8:sp:ig8)A(3*ig8:sp:ig8:sp:ig8
:sp:ig8:3*sp:2*ig8:sp)B(2*ig8:sp
:3*ig8:sp:ig8:sp:5*ig8)"
 490 LET a$(48)="(2*ig8:6*sp:ig8
:3*sp:ig8:3*sp:ig8:sp:ig8:sp:ig8
:sp)A(3*sp:ig8:3*sp:3*ig8:2*sp:2
*ig8:2*sp:ig8:3*sp:ig8:3*sp)B(2*
ig8)"
 500 LET a$(49)="(50*ig8)"
 510 LET a$(50)="(50*ig8)"
 512 BORDER 5: PAPER 2: INK 7: B
RIGHT 1: CLS
 515 GO SUB 5000: GO SUB 8000
 517 LET g=0
 520 LET x=25: LET y=26
 530 LET a=x: LET b=y
 540 LET x=x+(INKEY$="a")-(INKEY
$="q")
 550 LET y=y+(INKEY$="m")-(INKEY
$="n")
 555 IF INKEY$="0" THEN  GO TO 2
500
 560 IF a$(x,y)="(ig8)" THEN  LE
T x=a: LET y=b
 590 PRINT  PAPER 0; INK 6;AT 6,
14;a$(x-2,y-2 TO y+2)
 600 PRINT  PAPER 0; INK 6;AT 7,
14;a$(x-1,y-2 TO y+2)
 610 PRINT  PAPER 0; INK 6;AT 8,
14;a$(x,y-2 TO y-1);AT 8,17;a$(x
,y+1 TO y+2)
 620 PRINT  PAPER 0; INK 6;AT 9,
14;a$(x+1,y-2 TO y+2)
 630 PRINT  PAPER 0; INK 6;AT 10
,14;a$(x+2,y-2 TO y+2)
 640 PRINT  PAPER 0; INK 7;AT 8,
16;"C"
 650 IF a$(x,y)="B" THEN  GO SUB
 1000
 660 IF a$(x,y)="A" THEN  GO SUB
 1500
 670 IF a$(x,y)="M" OR a$(x,y)="
N" THEN  GO TO 2000
 680 PRINT AT 16,11; PAPER 1; IN
K 7;"SCORE = ";g;: IF g<100 AND
g>-10 THEN  PRINT  PAPER 1; INK
7;" "
 700 GO TO 530
1000 PRINT  INK 4; PAPER 0;AT 13
,14; FLASH 1;"GOLD!"
1005 FOR a=0 TO 20
1010 BEEP .01,a
1020 NEXT a
1030 LET a$(x,y)="  "
1040 LET g=g+10
1050 PRINT AT 13,14;"      "
1060 RETURN
1500 PRINT  PAPER 4; INK 0;AT 13
,11; FLASH 1;"FOOLS GOLD!"
1510 FOR a=20 TO 0 STEP -1
1520 BEEP .01,a
1530 NEXT a
1540 LET a$(x,y)="  "
1550 LET g=g-5
1560 PRINT AT 13,11;"
"
1570 RETURN
2000 CLS : PRINT  PAPER 6; INK 1
;AT 5,7;"You Got Out Of The"; PA
PER 4; INK 0;AT 7,12;"EFGHIJKL"
2010 PRINT  PAPER 5; INK 1;AT 10
,7;"Your Score Was ";g
2020 PRINT  PAPER 1; INK 6;AT 15
,0;"   Press 'Y' To Play Again,
Or      'N' To Stop The Program.
   "
2025 GO SUB 3000
2030 IF INKEY$="y" THEN  RUN
2040 IF INKEY$="n" THEN  STOP
2050 GO TO 2030
2500 CLS : PRINT  PAPER 7; INK 1
;AT 5,0;"You Didn't Reach The Ex
it Of The"
2510 PRINT  PAPER 0; INK 4;AT 7,
12;"EFGHIJKL"
2520 PRINT  PAPER 1; INK 5;AT 10
,7;"Your Score Was ";g
2530 PRINT  PAPER 6; INK 1;AT 15
,0;"   Press 'Y' To Play Again,
Or      'N' To Stop The Program.
   "
2535 GO SUB 3500
2540 IF INKEY$="y" THEN  RUN
2550 IF INKEY$="n" THEN  STOP
2560 GO TO 2540
3000 RESTORE 3000: FOR a=1 TO 22
3010 READ d,p
3020 BEEP d,p
3030 NEXT a
3040 DATA .25,0,.25,2,.25,4,.5,5
,.75,0,.25,5,.25,4,.25,5,.5,7,.7
5,2,.25,2,.25,4,.25,5,.25,9,.25,
7,.25,7,.25,5,.25,5,.25,4,.25,2,
.25,4,1,0
3050 RETURN
3500 RESTORE 3500: FOR a=1 TO 8
3510 READ d,p
3520 BEEP d,p
3530 NEXT a
3540 DATA .5,5,.15,0,.15,-1,.15,
0,.5,1,1,0,.5,4,.75,5
3550 RETURN
5000 RESTORE 5000
5010 FOR a=1 TO 37
5020 READ d,p
5030 BEEP d,p
5040 PRINT AT 5,5; INK (RND*5)+3
;" G O L D   M A Z E"
5060 PRINT AT 15,7; INK 7; PAPER
 1;"Press 'S' To Start"
5070 IF INKEY$="s" THEN  RETURN
5080 NEXT a
5090 DATA .1,7,.1,5,.1,7,.1,5,.4
,4,1,0,.1,4,.1,5,.1,7,.1,5,.1,7,
.1,5,.1,4,.1,5,.1,7,.1,9,.1,10,.
1,9,.1,10,.1,9,1.5,7,1,12,.5,11,
.4,9,.1,7,.1,5,.1,4,.1,5,.4,7,.5
,4,.1,8,.1,7,.1,5,.1,7,.4,8,.5,5
,2,12
5100 GO TO 5000
8000 CLS
8010 PRINT AT 3,8; INK 4; PAPER
0;"E F G H I J K L"
8030 PRINT AT 9,0;" You (C) are
in a big maze (morethan twice as
 big as the screen)and you have
to get to the   MN,  collecting
gold (          B) on the way. E
ach bar of gold is worth TEN   p
oints, and if you pick up any  f
ools gold (     A), FIVE points
willbe deducted from your score.
"
8040 PRINT AT 21,4; INK 1; PAPER
 7;"Press Any Key To Continue"
8045 IF INKEY$<>"" THEN  GO TO 8
045
8050 IF INKEY$="" THEN  GO TO 80
50
8060 CLS
8070 PRINT AT 3,8; INK 4; PAPER
0;"E F G H I J K L"
8080 PRINT AT 6,0;" You can only
 see 1/100th of themaze on the s
creen."
8100 PRINT AT 18,0;" The Keys Wi
ll Be Shown At The  Bottom Of Th
e Screen."
8110 PRINT AT 21,4; INK 1; PAPER
 7;"Press Any Key To Continue"
8115 IF INKEY$<>"" THEN  GO TO 8
115
8120 IF INKEY$="" THEN  GO TO 81
20
8130 CLS
8140 PRINT AT 5,13;"DDDDDDD(ig7)
"
8150 FOR a=6 TO 10: PRINT AT a,1
3;"D(5*ig8)D(ig5)": NEXT a
8160 PRINT AT 11,13;"DDDDDDD(ig5
)"
8170 PRINT AT 12,13;"(g1:6*g3:g2
)"
8180 PRINT AT 2,9; INK 4; PAPER
0;"E F G H I J K L"
8190 PRINT AT 15,10;"DDDDDDDDDDD
DD(ig7)"
8200 PRINT AT 16,10;"D(11*sp)D(i
g5)"
8210 PRINT AT 17,10;"DDDDDDDDDDD
DD(ig5)"
8220 PRINT AT 18,10;"(g1:12*g3:g
2)"
8230 PRINT AT 20,0;"   KEYS: Q=U
P, A=DOWN, N=LEFT,        M=RIG
HT, 0=GIVE UP          "
8240 RETURN
9000 REM To SAVE, GOTO 9000
9005 CLS : PRINT AT 0,3;"Rutine
For SAVING EFGHIJKL"
9010 SAVE "goldmaze" LINE 9500
9020 SAVE "goldgrafix"CODE USR "
a",21*8
9030 PRINT AT 5,2;"Rewind Tape F
or VERIFICATION"
9040 VERIFY "goldmaze"
9050 VERIFY "goldgrafix"CODE
9060 PRINT AT 10,14; FLASH 1;"OK
!"
9070 STOP
9500 LOAD "goldgrafix"CODE USR "
a"
9510 RUN
```

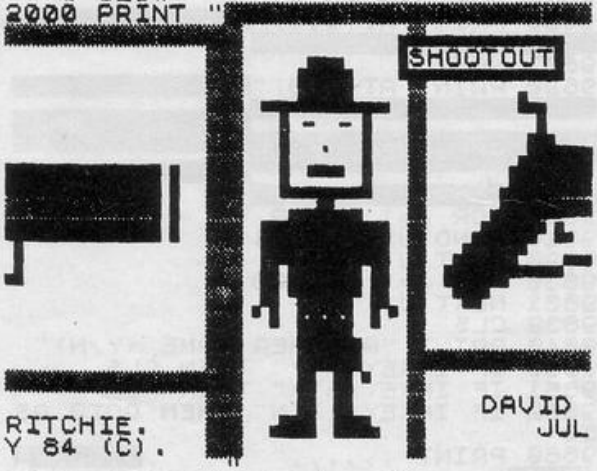


ALIEN SHOOTOUT

ALIEN SHOOTOUT was not chosen for its originality but for its good graphical content. The game also contains some impressive effects. You are challenged to a duel by an alien on the planet Zyg. The first competitor to score five points wins the duel.

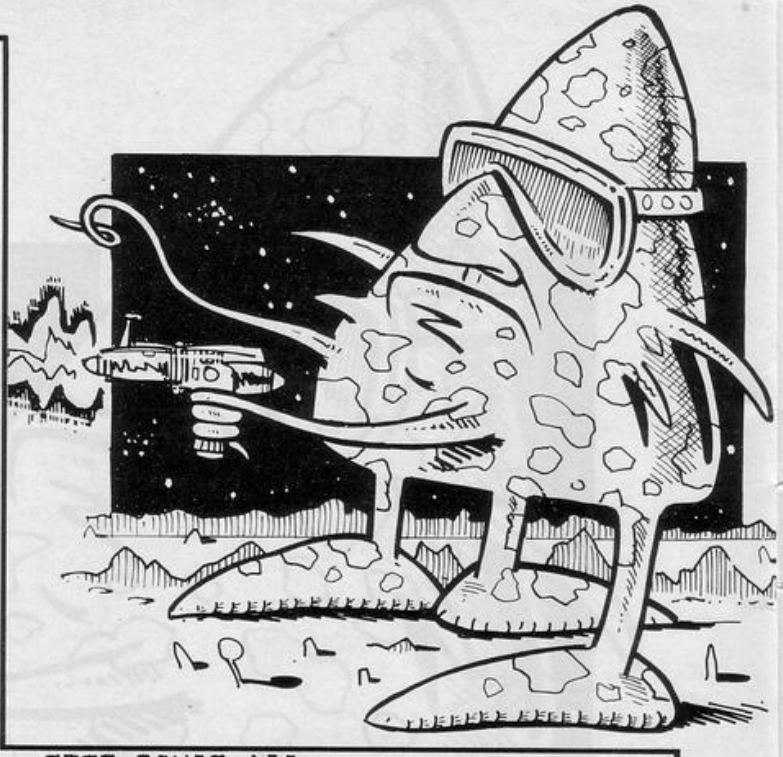
Alien Shootout was written for the 16K ZX-81 by David Ritchie, aged 14, of Stockbridge Village, Liverpool.

```
   1 REM E£RND▚*F7 SAVE TAN LEN
■?/ PAUSE .
   2 LET M$="042 012 064 006 023
 043 035 126 254 118 032 003 016
 248 201 198 128 119 024 242 "
   3 FAST
   4 FOR M=16514 TO 16533
   5 POKE M,VAL M$( TO 3)
   6 LET M$=M$(5 TO )
   7 NEXT M
   8 SLOW
2000 PRINT "
```




```
2001 PRINT AT 20,31;"■"
2010 PRINT AT 21,0;"
                    "
2020 PRINT AT 21,0;"
                    "
2030 IF INKEY$="" THEN GOTO 2010
2040 FOR J=1 TO 40
2050 RAND USR 16514
2060 NEXT J
2070 FOR J=1 TO 100
2080 NEXT J
2090 CLS
4000 PRINT TAB 10;"SHOOTOUT";TAB
 10;"========="
4010 PRINT ,," YOU HAVE CRASHED
ON PLANET ZYG.AN ALIEN CATCHES Y
OU AND          CHALLENGES YOU TO
A DUEL........."
4020 PRINT "TWO MEN WILL BE DRAW
N ON THE     SCREEN.YOU ARE THE O
NE ON THE     LEFT. THE ALIEN WHOM
 YOU HAVE TOKILL IS ON THE RIGHT
."
4030 PRINT """THE ALIEN DRAWS""
WILL COME ON     THE SCREEN."
4032 PRINT "AS SOON AS ""[illegible]
OT""" COMES    UP FIRE YOUR COLT
BY PRESSING    ANY KEY.WHOEVER WI
NS WILL WIN   A POINT.THE FIRST T
O 5 IS THE      [illegible]."
4050 PRINT "PRESS A KEY"
4052 PAUSE 4E4
4053 CLS
4060 PRINT "ENTER DIFFICULTY....
              (1-IMPOSSIBLE) - (5-
SIMPLE)."
4070 INPUT DIF
4080 LET DIF=DIF*DIF
5000 REM [illegible]
```

```
5010 LET AL=0
5020 LET PL1=0
5499 REM BATTLE 2-
5500 CLS
5501 PRINT AT 0,11;"-SCORE-"
5505 PRINT AT 0,28;" "
5506 PRINT AT 0,9;PL1;AT 0,18;AL
5510 PRINT AT 1,0;"
                    "
5511 PRINT AT 14,0;" "
5520 PRINT AT 21,0;"
                                "
5530 FOR J=1 TO 100
5540 NEXT J
5550 PRINT AT 2,13;"THE";AT 4,12
;"ALIEN";AT 6,12;"DRAWS"
5560 LET J=INT (RND*300)+1
5570 FOR Z=1 TO J
5575 IF INKEY$<>"" THEN GOTO 590
0
5580 NEXT Z
5585 FAST
5590 PRINT AT 18,11;"AND SHOOT!"
5595 SLOW
5600 FOR T=1 TO (INT (RND*DIF)+2
)
5601 IF INKEY$<>"" THEN GOTO 570
0
5603 NEXT T
5604 GOSUB 9000
5606 FOR J=1 TO 100
5608 NEXT J
5610 CLS
5612 PRINT "ANOTHER POINT TO THE
 ALIEN"
5614 LET AL=AL+1
5616 IF AL>=5 THEN GOTO 9500
5617 PAUSE 100
5618 GOTO 5500
5700 GOSUB 9000
5710 FOR J=1 TO 100
5720 NEXT J
5730 PRINT "A POINT TO YOU - LUC
KY EH..."
5740 LET PL1=PL1+1
5750 IF PL1>=5 THEN GOTO 9600
```



```
5755 PAUSE 100
5760 GOTO 5500
5900 CLS
5910 PRINT "CHEAT"
5911 FOR J=1 TO 22
5912 RAND USR 16514
5913 NEXT J
5914 GOTO 5614
5920 LET AL=AL+1
5930 GOTO 5500
9000 FAST
9001 PRINT AT 11,10;"
 ";AT 12,10;"
9010 PRINT AT 13,10;"
 "
9020 PRINT AT 14,10;"
 "
9030 PRINT AT 15,10;"
 "
9040 SLOW
9050 FOR J=1 TO 22
9060 RAND USR 16514
9070 NEXT J
9080 RETURN
9500 REM ALIEN WON GAME
9505 FOR J=0 TO 21
9506 PRINT AT J,0;"
                                "
9507 NEXT J
9520 PRINT AT 9,0;"
                                THE ALIEN HAS
 WON THE GAME.....
                                "
9530 GOTO 9800
9600 REM PLAYER WON GAME
9605 FOR J=0 TO 21
9606 PRINT AT J,0;"
                                "
9607 NEXT J
9620 PRINT AT 9,0;"
                                YOU HAVE WON
THE GAME. WELL DONE
                                "
9800 FOR J=1 TO 22
9810 RAND USR 16514
9820 NEXT J
9830 FOR J=1 TO 100
9831 NEXT J
9832 CLS
9840 PRINT "ANOTHER GAME (Y/N)"
9850 IF INKEY$="Y" THEN CLS
9851 IF INKEY$="Y" THEN RUN
9852 IF INKEY$<>"N" THEN GOTO 98
50
9860 PRINT ,,,,,,"          GOODBYE
 THEN"
9997 STOP
9998 SAVE "SHOOTOUT"
9999 RUN
```

BETA BASIC 1.8

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DO-LOOP structure
DPOKE double poke
EDIT specified line
ELSE fused with IF . . THEN)
EXIT leave DO-LOOP
FILL enclosed area with specified ink or paper
GET wait for keypress
JOIN two program lines
KEY$ a string
KEYWORDS new keywords on/off
LIST/LLIST line TO line
USED (used with GOTO, GOSUB)
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PLOT a string (may contain cursor control codes)
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USING used with PRINT
WHILE used with DO or LOOP
XGS, YGS move PLOT origin
XRG, YRG change PLOT scale

FUNCTIONS

AND (bit-by-bit)
BIN£ decimal to binary
CHAR$ number to 2 characters
COSE fast cosine
DEC hexadecimal to decimal
DPEEK double PEEK
FILLED filled area
HEX$ decimal to hexadecimal
INSTRING string search
MEM free memory
MEMORY$ all of memory as a string
MOD modulus
NUMBER 2 characters to number
OR (bit-by-bit)
RNDM fast RND
SCRN$ recognises user graphics
SINE fast sine
STRING$ repeats strings
TIME$ current time
USING$ formats numbers
XOR (bit-by-bit)

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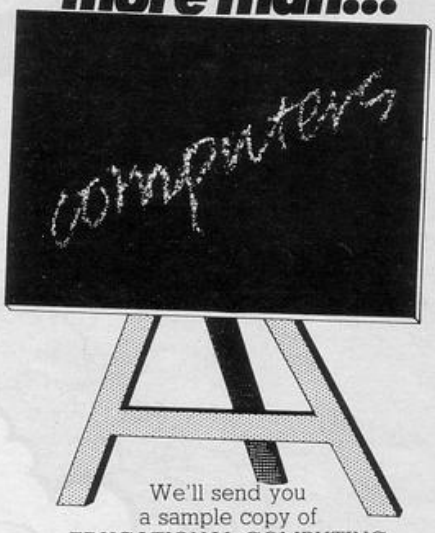

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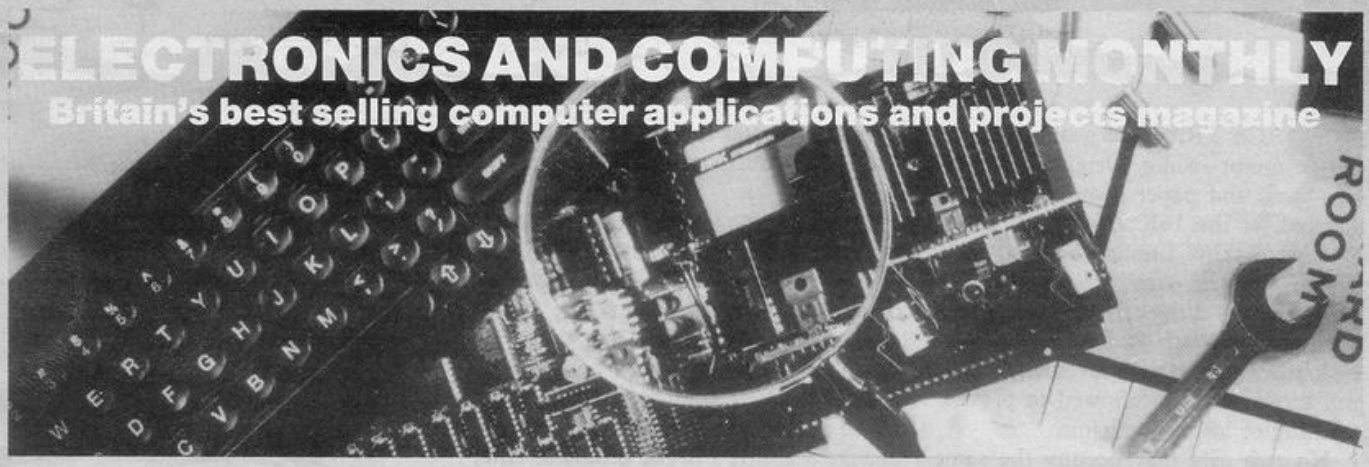

THE QL MYSTERIES
While the QL's SuperBasic is a very good programming language, QDOS has a number of shortcomings. Fortunately the power of the machine can be simply increased by adding to the QL's command set. We present nine routines, written in SuperBasic, designed to make full use of the QL's undoubted potential.

SPECTRUM TEXT PROCESSOR
A simple, but versatile, program that allows the Spectrum to be used as a straightforward text processor. Full listing given in the October issue.

BASIC BUG HUNTING
Whether you own a Spectrum, BBC micro, Dragon or one of the recently launched computers such as the Amstrad CPC464, in all probability you'll be writing programs in BASIC. It's the way of the world that most programs will not work first time and tracing the inevitable bugs can prove a frustrating and time-consuming process. Our article on bug hunting will help you track down bugs and get your programs up and running in record time.

PLUS all the latest news from the world of microcomputing in addition to the range of regular features.

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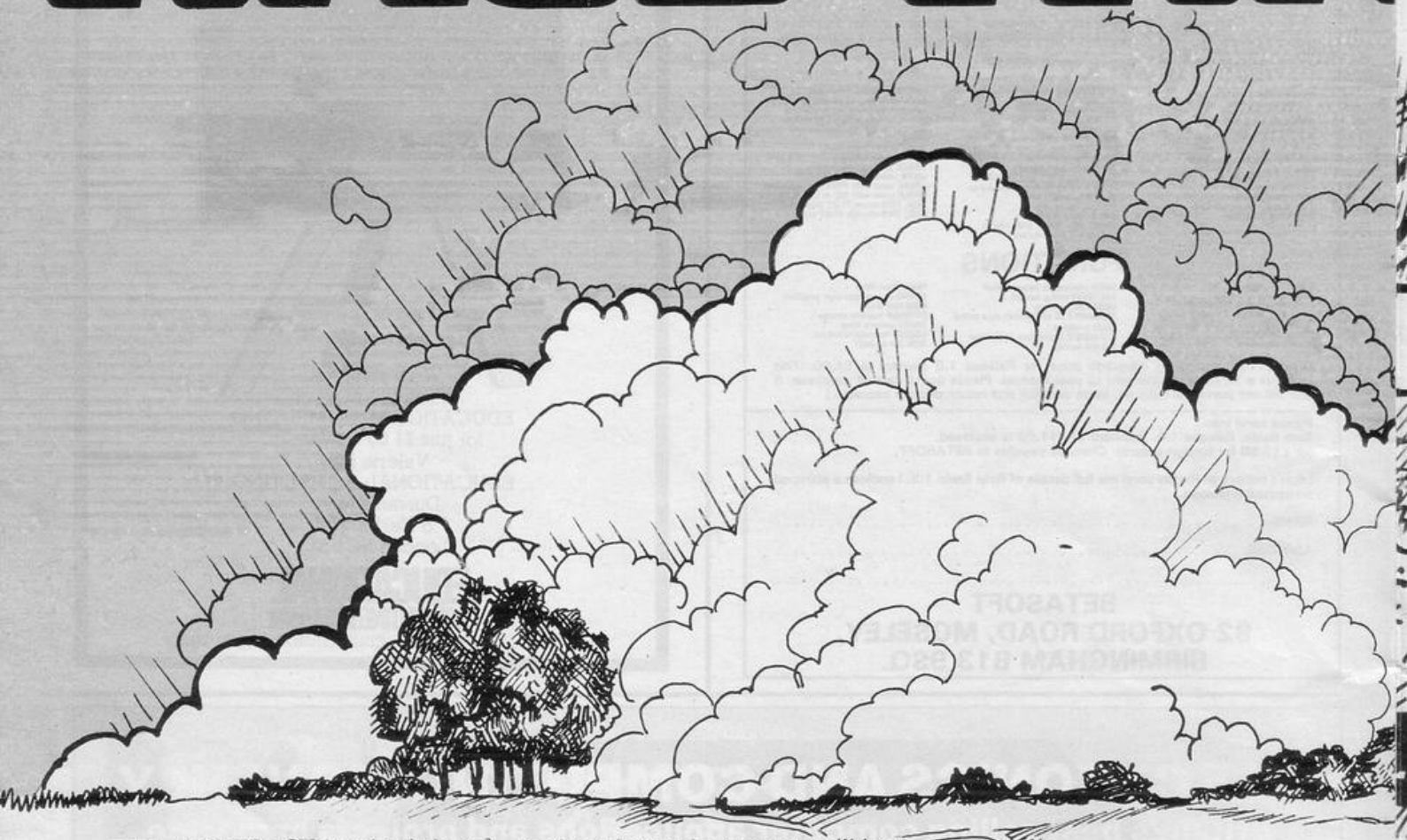


RACE TRACK is a simulation of motor racing. Originally a pencil and paper game it has been adapted for the 16K ZX-81 by Jerome K. Laskowski of London SE6.

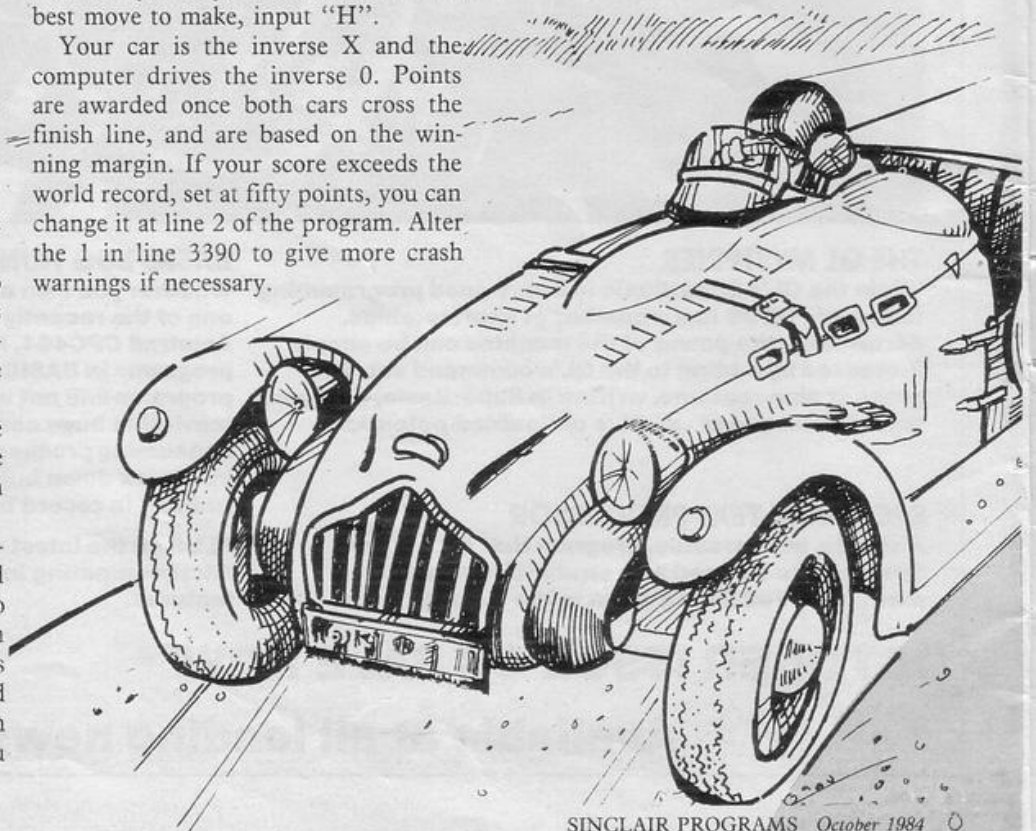
You play against the computer, which always moves first, and you can choose to play up to five laps. Three basic rules govern the movement of cars and these must be followed to prevent crashing or losing the game.

1. No two cars may occupy the same point at the same time.
2. The point to which you wish to move and the line which connects your current position to your anticipated position must lie within the track borders.
3. The length of your move must be one more than, one less than or the same as the previous move for both horizontal and vertical moves.

The moves should be entered as follows; to move three squares right and one up you would input "31" and to move two squares right and one down you would input "2-1". Invalid moves will be ignored by the computer and should an input mean a possible crash you will be given a warning. If you persist and enter the move you will lose the race and fifty points will be deducted.

If at any time you need advice on the best move to make, input "H".

Your car is the inverse X and the computer drives the inverse 0. Points are awarded once both cars cross the finish line, and are based on the winning margin. If your score exceeds the world record, set at fifty points, you can change it at line 2 of the program. Alter the 1 in line 3390 to give more crash warnings if necessary.

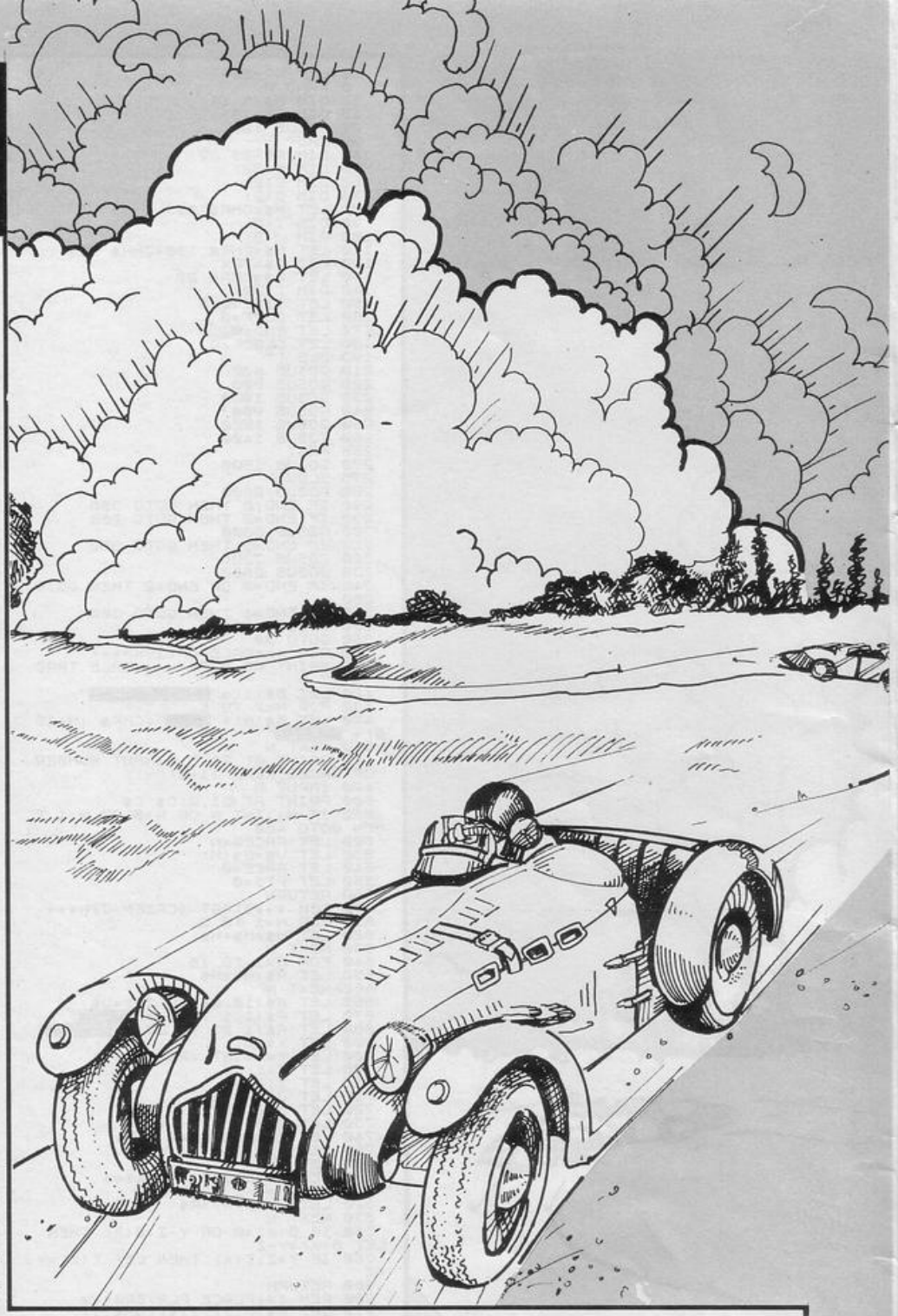


ACK

Pro Printout

```
  2 LET WR=50
  5 RAND 0
 10 DIM B$(5,11)
 15 DIM C$(16)
 20 GOSUB 400
 30 FAST
 40 DIM A$(18,32)
 50 DIM B(32)
 60 DIM C(2)
 70 DIM D(2)
 80 LET H$=CHR$ 155
 90 DIM I(2)
100 DIM J(2)
110 LET M$=CHR$ 180+CHR$ 189
120 LET P$="OX"
130 LET R$=CHR$ 27
140 DIM T(32)
150 LET TIME=0.5
160 LET DIFF=0
170 LET END=0
180 LET CLOCK=0
190 CLS
210 GOSUB 600
220 GOSUB 800
230 GOSUB 1000
240 GOSUB 900
250 GOSUB 1200
260 GOSUB 1400
265 FAST
270 GOSUB 1500
275 SLOW
280 GOSUB 2600
290 IF END>2 THEN GOTO 350
295 IF END=2 THEN GOTO 260
300 GOSUB 3000
310 IF END=5 THEN GOTO 350
320 GOSUB 3200
330 GOSUB 2600
340 IF END=0 OR END=2 THEN GOTO
260
345 IF END=1 THEN GOTO 300
350 GOSUB 4100
360 GOTO 30
400 REM ***RACE OPTIONS***
410 PRINT AT 6,7;"<<< RACE TRAC
K >>>"
420 LET B$(1)="SINGLE RACE"
430 FOR N=2 TO 5
440 LET B$(N)="    "+CHR$ (N+15
6)+" RACES"
450 NEXT N
480 PRINT AT 21,0;"INPUT NUMBER
OF RACES REQD (1-5)"
490 INPUT N
500 PRINT AT 21,0;C$;C$
510 IF N<>INT N OR N>5 OR N<1 T
HEN GOTO 480
520 LET RACES=N
530 LET V$=B$(N)
540 LET RACE=0
550 LET PTS=0
560 RETURN
600 REM ***START SCREEN GEN***
610 FOR N=1 TO 5
620 LET H$=H$+H$
630 NEXT N
640 FOR N=1 TO 18
650 LET A$(N)=H$
660 NEXT N
665 LET A$(18,22 TO 32)=V$
670 LET A$(1,1 TO 5)="START"
680 LET A$(1,27 TO 32)="FINISH"
690 LET X=1
700 LET Y=4+INT (RND*10+1)
705 LET I(1)=X
710 LET I(2)=X
715 LET J(1)=Y
720 LET J(2)=Y
730 LET Z=3
740 LET RACE=RACE+1
750 LET M=3
760 RETURN
800 REM ***BUILD TRACK***
810 FOR N=Y-Z TO Y+Z
820 LET A$(N,X)=R$
830 NEXT N
840 IF B(X)=0 OR Y-Z<B(X) THEN
LET B(X)=Y-Z
850 IF Y+Z>T(X) THEN LET T(X)=Y
+Z
860 RETURN
900 REM ***PLACE PLAYERS***
910 LET A$(J(1),I(1))=M$(1)
920 LET N=INT (RND*7-3)
930 IF N=0 THEN GOTO 920
940 LET J(2)=J(2)+N
950 LET A$(J(2),I(2))=M$(2)
960 RETURN
1000 REM ***ROAD GENERATION***
1010 LET N=M+INT (RND*3-1)
1020 IF N<1 OR N>5 THEN GOTO 101
0
1030 LET NX=X-ABS INT ((N-1.5)/3
)+1
1040 LET NY=Y-SGN (N-3)
1050 IF NY>4 AND NY<15 THEN GOTO
 1080
1060 LET N=3
1070 GOTO 1030
1080 LET X=NX
1090 LET Y=NY
1100 LET M=N
1110 LET Z=INT (RND*3+1)
1120 GOSUB 800
1130 IF X<>RACE THEN GOTO 1160
1140 LET I(1)=X
1150 LET J(1)=Y
1160 IF X<32 THEN GOTO 1010
1170 RETURN
1200 REM ***PRINT SCREEN***
1210 PRINT "+Y";TAB 6;"<<< RACE
TRACK >>>  RACE ";RACE
1220 FOR N=18 TO 1 STEP -1
1230 PRINT A$(N)
1240 NEXT N
1250 PRINT "-Y";TAB 9;"TIME 0";T
AB 19;"X Y";TAB 30;"+X"
1260 PRINT TAB 9;"SPEEDS: ";M$(1
);" 0 0  PTS ";PTS
1270 PRINT "NEWLINE TO START";TA
B 17;M$(2);" 0 0  WR=";WR
1290 SLOW
1300 INPUT D$
1310 PRINT AT 21,0;C$
1320 RETURN
1400 REM ***STEER DIRECTION***
1410 LET P=1
1420 PRINT AT 21,0;"COMPUTER MOV
ING"
1430 LET DIR=1
1435 LET STR=0
1440 LET AV=(T(32)+B(32))/2
1450 LET N=C(P)+I(P)+1
1460 IF N<=32 THEN LET AV=(T(N)+
B(N))/2
1470 IF D(P)+J(P)>AV THEN LET DI
R=-1
1480 IF D(P)+J(P)=AV THEN LET ST
R=1
1490 RETURN
1500 REM ***TRY POSSIBLES***
1510 FOR K=C(P)+1 TO C(P)-1 STEP
 -1
1520 IF K<0 OR K>6 THEN GOTO 158
0
1530 FOR L=D(P)+DIR TO D(P)-DIR
STEP -DIR
1535 IF K=C(P)+1 AND L=D(P)+DIR
AND STR=1 THEN GOTO 1570
1540 IF ABS L>6 THEN GOTO 1570
1550 GOSUB 1700
1555 IF V=2 THEN LET END=END+1
1560 IF V<>1 THEN GOTO 1650
1570 NEXT L
1580 NEXT K
1590 IF P=1 THEN GOTO 1620
1600 LET X=100
1610 RETURN
1620 GOSUB 3500
1625 LET END=4
1630 RETURN
1650 LET X=K
1660 LET Y=L
1670 RETURN
1700 REM ***STOPPING DISTANCE***
1710 LET V=0
1720 IF K=0 AND L=0 THEN RETURN
1730 LET SAVEI=I(P)
1740 LET SAVEJ=J(P)
1750 DIM 0(200,5)
1760 LET 0(1,1)=I(P)
1770 LET 0(1,2)=J(P)
1780 LET 0(1,3)=K
1790 LET 0(1,4)=L
1800 LET POINT=0
1810 LET FREE=1
1820 GOSUB 1900
1830 LET I(P)=SAVEI
1840 LET J(P)=SAVEJ
1850 RETURN
1900 REM ***CASCADE CHECK***
1910 LET POINT=POINT+1
1920 IF POINT>200 THEN LET POINT
=1
1930 LET V=0
1940 LET I(P)=0(POINT,1)
1950 LET J(P)=0(POINT,2)
1960 LET X=0(POINT,3)
1970 LET Y=0(POINT,4)
1980 IF J(P)<>0 THEN GOTO 2010
1990 LET V=1
2000 RETURN
2010 IF X=0 AND Y=0 THEN RETURN
2020 GOSUB 3600
2030 IF V=1 THEN GOTO 1910
2040 IF V=2 OR (X<2 AND ABS Y<2)
 THEN GOTO 2070
2050 GOSUB 2100
2060 GOTO 1910
2070 IF V=2 AND POINT<>1 THEN LE
T V=0
2080 RETURN
2100 REM ***STACK MOVES***
2110 LET 0(POINT,1)=0(POINT,1)+X
2120 LET 0(POINT,2)=0(POINT,2)+Y
2130 IF X>ABS Y THEN GOTO 2200
2140 GOSUB 2300
2150 FOR X=BOT TO TOP
2160 GOSUB 2500
2170 NEXT X
2180 RETURN
2200 GOSUB 2400
2210 FOR Y=BOT TO TOP
2220 GOSUB 2500
2230 NEXT Y
2240 RETURN
2300 REM ***MOVES: X<=ABS Y***
2310 LET BOT=0
2320 LET TOP=0
2330 IF X=0 THEN GOTO 2360
2340 LET BOT=X-1
2350 LET TOP=X-1
2360 IF ABS Y>=X+1 THEN LET TOP=
X
2370 IF ABS Y>=X+2 THEN LET TOP=
X+1
2380 LET Y=Y-SGN (Y+0.5)
2390 RETURN
2400 REM ***MOVES: X>ABS Y***
2410 LET X=X-1
2420 LET BOT=Y
2430 LET TOP=Y
2440 IF ABS (Y-1)<=X THEN LET BO
T=Y-1
2450 IF ABS (Y+1)<=X THEN LET TO
P=Y+1
2460 RETURN
2500 REM ***FILL STACK***
2510 LET FREE=FREE+1
2520 IF FREE>200 THEN LET FREE=1
2530 LET 0(FREE,1)=0(POINT,1)
2540 LET 0(FREE,2)=0(POINT,2)
2550 LET 0(FREE,3)=X
2560 LET 0(FREE,4)=Y
2570 RETURN
2600 REM ***MOVE CAR***
2610 GOSUB 2800
2615 IF V<>3 THEN GOTO 2630
2620 LET X=CX-I(P)
2625 LET Y=CY-J(P)
2630 PRINT AT 19-J(P),I(P)-1;P$(
P)
2640 LET I(P)=I(P)+X
2650 LET J(P)=J(P)+Y
```

Pro Printout



```
2620 LET X=CX-I(P)
2625 LET Y=CY-J(P)
2630 PRINT AT 19-J(P),I(P)-1;P$(
P)
2640 LET I(P)=I(P)+X
2650 LET J(P)=J(P)+Y
2660 IF V<>2 THEN GOTO 2700
2670 LET I(P)=32
2680 LET J(P)=F
2700 PRINT AT 19-J(P),I(P)-1;M$(
P)
2710 IF (P=1 AND END=1) OR (P=2
AND END=2) THEN GOSUB 2900
2720 LET C(P)=X
2730 LET D(P)=Y
2740 RETURN
2800 REM ***DISPLAY SPEEDS***
2805 PRINT AT 21,0;C$
2810 LET TIME=TIME+0.5
2815 IF CLOCK=1 THEN LET TIME=TI
ME+0.5
2820 PRINT AT 19,14;INT TIME
2825 IF CLOCK=0 THEN GOTO 2850
2830 LET DIFF=DIFF+1
2835 PRINT AT 20,0;"DIFF ";DIFF
2850 PRINT AT 19+P,19;"      "
2860 PRINT AT 19+P,19;X;TAB 21;Y
2870 IF END>0 AND END<4 THEN LET
 CLOCK=1
2880 RETURN
2900 REM ***WINNING DISPLAY***
2910 FOR N=1 TO 7
2920 PRINT AT 19-J(P),I(P)-1;R$
2930 PRINT AT 19-J(P),I(P)-1;M$(
P)
2940 NEXT N
2945 IF END<>1 THEN GOTO 2970
2950 LET Z$="COMPUTER WINS"
2955 GOSUB 4000
2960 LET Z$="KEEP MOVING  "
2965 GOTO 2985
2970 LET Z$=C$
2980 IF END=2 THEN LET Z$="YOUR
CAR WINS"
2985 GOSUB 4000
2990 RETURN
3000 REM ***PRE-MOVE CHECK***
3005 PRINT AT 21,0;"PRE-MOVE CHE
CK"
3010 LET P=2
3020 FOR X=C(P)-1 TO C(P)+1
3030 IF X<0 THEN GOTO 3080
3040 FOR Y=D(P)-1 TO D(P)+1
3050 GOSUB 3600
3060 IF V<>1 THEN RETURN
3070 NEXT Y
3080 NEXT X
3090 PRINT AT 21,0;"CONCEDE? - (
Y/N)"
3100 INPUT D$
3110 PRINT AT 21,0;C$
3120 IF D$="N" THEN RETURN
3130 IF D$<>"Y" THEN GOTO 3090
3140 LET END=5
3150 LET V=2
3160 LET Z$="GAME CONCEDED"
3170 GOSUB 4000
3180 RETURN
3200 REM ***ACCEPT MOVE***
3205 LET W=0
3210 PRINT AT 21,0;"INPUT MOVE:"
"XY""""
3220 INPUT D$
3230 PRINT AT 21,0;C$
3235 IF D$="H" OR D$="HELP" THEN
 GOSUB 4500
3240 IF LEN D$<2 OR LEN D$>3 THE
N GOTO 3210
3250 LET S$="+"
3260 LET X$=D$(1)
3270 LET Y$=D$(2)
3280 IF LEN D$=2 THEN GOTO 3320
3290 IF Y$<>"+" AND Y$<>"-" THEN
 GOTO 3210
3300 LET S$=Y$
3310 LET Y$=D$(3)
3320 LET X=CODE X$-28
3330 LET Y=CODE Y$-28
3340 IF Y>9 OR Y<0 OR X>9 OR X<0
 THEN GOTO 3210
3350 IF S$="-" THEN LET Y=Y*-1
3360 IF ABS (X-C(P))>1 OR ABS (Y
-D(P))>1 THEN GOTO 3450
3370 GOSUB 3600
3375 IF V=2 THEN LET END=END+2
3380 IF V<>1 THEN RETURN
3390 IF W=1 THEN GOTO 3430
3400 LET Z$="CRASH WARNING"
3405 LET W=W+1
3410 GOSUB 4000
3420 GOTO 3210
3430 GOSUB 3500
3435 LET END=5
3440 RETURN
3450 LET Z$="ILLEGAL MOVE"
3460 GOSUB 4000
3470 GOTO 3210
3500 REM ***CRASH***
3510 LET V=3
3520 LET R$="  "
3530 LET M$(P)=CHR$ 151
3540 LET Z$="CRASH"
3550 GOSUB 4000
3560 RETURN
3600 REM ***VALIDATE MOVE***
3610 LET V=0
3620 IF X=0 AND Y=0 THEN RETURN
3630 LET NX=I(P)+X
3640 LET NY=J(P)+Y
3650 IF NX>32 THEN GOTO 3700
3660 IF NY<B(NX) THEN GOTO 3730
3670 IF NY>T(NX) THEN GOTO 3730
3680 IF NX=I(3-P) AND NY=J(3-P)
THEN GOTO 3730
3690 GOTO 3740
3700 LET V=2
3710 LET F=J(P)
3720 GOTO 3740
3730 GOSUB 3900
3740 IF X<2 THEN RETURN
3750 LET M=Y/X
3760 LET C=NY-M*NX
3770 FOR N=1 TO X-1
3780 LET NX=I(P)+N
3790 LET NY=M*NX+C
3800 IF NX>32 THEN RETURN
3810 IF NX=32 THEN LET F=INT (NY
+0.5)
3820 IF NY-0.0001<B(NX)-1 THEN G
OTO 3870
3830 IF NY+0.0001>T(NX)+1 THEN G
OTO 3870
3840 NEXT N
3850 RETURN
3870 GOSUB 3900
3880 RETURN
3900 REM ***INVALID MOVE***
3910 LET V=1
3920 LET CX=NX
3930 LET CY=INT (NY+0.5)
3940 IF NY<1 THEN LET CY=1
3950 IF NY>18 THEN LET CY=18
3960 RETURN
4000 REM ***FLASH MESSAGE***
4010 FOR N=1 TO 10
4020 PRINT AT 21,0;C$
4030 PRINT AT 21,0;Z$
4040 NEXT N
4050 RETURN
4100 REM ***CALCULATE POINTS***
4110 IF END=3 THEN LET GAIN=10+D
IFF*SGN (1.5-P)
4115 IF END=4 THEN LET GAIN=20
4120 IF END=5 THEN LET GAIN=-50
4125 IF GAIN>=0 THEN PRINT AT 20
,0;"GAIN ";GAIN
4130 IF GAIN<0 THEN PRINT AT 20,
0;"LOSE ";ABS GAIN
4135 LET PTS=PTS+GAIN
4140 PRINT AT 20,24;"PTS     ";A
T 20,28;PTS
4150 IF RACE=RACE5 THEN GOTO 419
0
4160 PRINT AT 21,0;"NEWLINE FOR
NEXT"
4170 INPUT D$
4180 RETURN
4190 LET Z$="GAME OVER"
4195 GOSUB 4000
4200 IF PTS<=WR THEN PRINT AT 21
,0;"WR UNCHANGED"
4210 IF PTS>WR THEN PRINT AT 21,
0;"WR BEATEN"
4220 STOP
4500 REM ***HELP PLAYER***
4505 FAST
4510 GOSUB 1430
4520 GOSUB 1500
4525 SLOW
4530 IF X<100 THEN GOTO 4560
4540 LET Z$="NO VALID MOVE"
4550 GOTO 4570
4560 LET Z$="BEST MOVE: "+STR$ X
+STR$ Y
4570 GOSUB 4000
4580 RETURN
```

ZX-81 OWNERS

SOFTWARE FARM

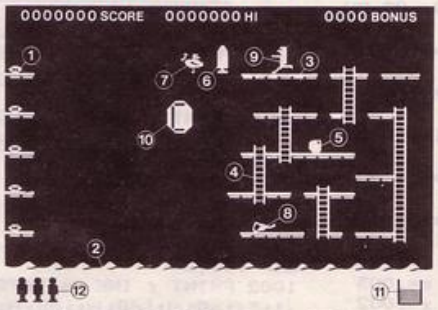
AT LAST THE PROGRAM YOU'VE BEEN WAITING FOR!

Rocket Man

Coming Soon! SPECTRUM VERSION

with Hi-Res Graphics on standard ZX-81 16K

Actual ZX-81 Screen Display!



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

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 Pac 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!

The aim is to collect all the diamonds from the far left hand side of the screen, whilst avoiding the rampant Bubloid. These emerge from the sea and are hell-bent on returning to their watery habitat with you in tow. Sooner or later you are going to end up in the drink – The idea is to make it later!

By belting round the system of platforms and ladders, cleverly avoiding the Bubloid, you collect the fuel cans which appear in random positions, until you consider that your fuel gauge indicates sufficient in the tank. Now you can go and collect your rocket. With the rocket-pack strapped to your back you can fly across the expanse of sea to collect the diamonds . . . but don't run out of fuel or your rocket-pack will simply disappear and you will wind up in the drink!

There are six stages with six different platform layouts. On stages 1-3 the Bubloid, which floats in front of the platforms with uncanny ease, gets an ever increasing ability to home in on your position, making the task of staying alive more demanding with each stage. On stages 4-6 you once again start with the easiest Bubloid (which is a blessed relief!) but the fuel cans are replaced by legs of lamb which you must collect to feed your vulture, and once it has enough energy (or you think it has!) you must flap across the water on its back to collect the diamonds.

Extra men are awarded for every 10,000 points – but ONLY once you have collected all the diamonds and so completed each particular stage.

GOOD LUCK!

Available from all good computer shops or send cheque/P.O. for £5.95 (inc P&P) to:

Software Farm, FREEPOST (no stamp required) (BS3658) , BS8 2YY Dept SP

Software Farm, 155 Whiteladies Road, Clifton, Bristol BS8 2RF.
Telephone (0272) 731411 Telex 444742 AFMADV G

FIRE CHIEF

SAVE the children from the fire before the flames become too fierce. The children will appear at the windows of the tower and you must race up and down the fire engine ladder to reach them. Once you have lost your three lives the building will crumble.

Fire Chief was written for the 16K Spectrum by Peter Glancy, aged 15, of Liberton, Edinburgh.

```
  1 GO SUB 6000
  5 LET sc=0: LET l=3: LET x=15
: LET y=9
  6 FLASH 0: BRIGHT 0
 10 LET j=9: LET h=3
 11 LET a=0: LET b=0: LET c=0
 20 FOR k=1 TO 12: FOR n=0 TO 7
: READ a: POKE USR (CHR$ (143+k)
)+n,a: NEXT n: NEXT k
 25 DATA 8,28,28,62,28,60,28,14
0
 26 DATA 252,28,28,54,54,55,55,
119
 27 DATA 68,76,84,100,68,76,84,
100
 28 DATA 0,36,20,75,126,126,254
,254
 29 DATA 0,0,16,8,12,44,60,60
 30 DATA 0,0,0,0,127,127,255,0
 31 DATA 0,0,0,0,248,252,6,3
 32 DATA 231,231,195,195,129,19
5,195,195
 33 DATA 0,0,0,0,0,4,46,126
 34 DATA 0,0,0,16,60,12,12,28
 35 DATA 0,0,0,0,3,115,126,124
 36 DATA 126,126,0,0,0,0,0,0
 40 LET k=15
 50 BORDER 7: PAPER 5: INK 4: C
LS
 51 PRINT AT 17,0;"(160*ig8)"
 52 INK 2: PAPER 0: FOR n=2 TO
18 STEP 2: PRINT AT n,1;"      L
": NEXT n
 53 INK 0: PAPER 6: FOR n=3 TO
17 STEP 2: PRINT AT n,1;"(ig8:H:
ig8:H:ig8:H:ig8)": NEXT n
 54 PRINT AT 19,1;"(4*ig8:sp:2*
ig8)"
 55 INK 7: PRINT AT 3,15;"(4*ig
8)";AT 4,14;"(6*ig8)";AT 5,17;"(
2*ig8)"
 56 PRINT AT 4,23;"(2*ig8)";AT
5,21;"(7*ig8)";AT 6,22;"(4*ig8)"
 60 INK 2: PRINT AT 17,9;"(6*ig
8)";AT 18,9;"(6*ig8)";AT 19,9;"(
8*ig8)"; PAPER 0;AT 20,9;"(2*ig8
:g3:3*ig8:g3:ig8)"; PAPER 4; INK
 0;AT 21,11;"(g3)";AT 21,15;"(g3
)"
 61 PRINT ; PAPER 2; INK 6;AT 1
8,10;"FIRE"
 62 PAPER 4: INK 0: PRINT AT 17
,15;"(g6)";AT 18,16;"(g6)"
 63 PRINT ; PAPER 2; INK 0;AT 1
7,9;"(ig4)"
 65 PAPER 5: FOR n=2 TO 16: PRI
NT AT n,9;"C": NEXT n
 66 NEXT n
 99 GO SUB 500
100 PRINT ; INK 7;AT x,y;"A";AT
x+1,y;"B"
101 BEEP .001,20
102 IF l=0 THEN  GO SUB 1999
150 IF a=0 THEN  GO SUB 600
151 IF b=0 THEN  GO SUB 610
152 IF c=0 THEN  GO SUB 620
200 IF a>0 THEN  LET a=a+1
201 IF b>0 THEN  LET b=b+1
202 IF c>0 THEN  LET c=c+1
220 IF a=8 THEN  LET q=3: GO SU
B 700
221 IF a=16 THEN  LET q=3: GO S
UB 710
222 IF a=21 THEN  LET q=3: GO S
UB 800
230 IF b=4 THEN  LET q=9: GO SU
B 700
231 IF b=10 THEN  LET q=9: GO S
UB 710
232 IF b=13 THEN  LET q=9: GO S
UB 800
240 IF c=8 THEN  LET q=15: GO S
UB 700
241 IF c=16 THEN  LET q=15: GO
SUB 710
242 IF c=21 THEN  LET q=15: GO
SUB 800
300 IF sc>200 THEN  LET z=.004
301 IF sc>400 THEN  LET z=.003
302 IF sc>600 THEN  LET z=.002
350 IF INKEY$="q" AND x>3 THEN
 LET x=x-1: PRINT ; INK 0;AT x+2
,y;"C"
351 IF INKEY$="z" AND x<15 THEN
 LET x=x+1: PRINT ; INK 0;AT x-
1,y;"C"
360 IF a>0 AND x=h THEN  LET q=
3: GO SUB 1000
370 IF x=j AND b>0 THEN  LET q=
9: GO SUB 1000
380 IF x=k AND c>0 THEN  LET q=
15: GO SUB 1000
400 GO TO 100
500 PRINT ; PAPER 1; INK 7;AT 1
0,20;"SCORE=";sc;AT 12,20;"LIVES
=";l;AT 16,20
501 RETURN
600 IF RND>.95 THEN  LET a=1: P
RINT ; PAPER 0; INK 3;AT h,7;"K"
601 RETURN
610 IF RND<.05 THEN  LET b=1: P
RINT ; PAPER 0; INK 3;AT j,7;"K"
611 RETURN
620 IF RND>.05 AND RND<.10 THEN
 LET c=1: PRINT ; PAPER 0; INK
3;AT k,7;"K"
621 RETURN
700 PRINT ; INK 2; PAPER 6;AT q
,2;"E"; INK 6; PAPER 0;AT q-1,2;
"D"
701 BEEP .01,20: RETURN
710 PRINT ; INK 2; PAPER 6;AT q
,4;"E"; INK 6; PAPER 0;AT q-1,4;
"D"
711 BEEP .01,20: RETURN
800 PRINT ; INK 2; PAPER 6;AT q
,6;"E"; INK 6; PAPER 0;AT q-1,6;
"D"
801 PRINT ; FLASH 1; BRIGHT 1;
INK 2; PAPER 6;AT q,7;"K"
805 FOR n=0 TO 40: BEEP .002,n:
 NEXT n
806 LET l=l-1
807 PRINT ; INK 0; PAPER 6;AT h
,1;"(ig8:H:ig8:H:ig8:H:ig8)"; IN
K 2; PAPER 0;AT h-1,1;"       L"
808 LET a=0: LET b=0: LET c=0
809 PRINT ; INK 0; PAPER 6;AT j
,1;"(ig8:H:ig8:H:ig8:H:ig8)"; IN
K 2; PAPER 0;AT j-1,1;"       L"
810 PRINT ; INK 0; PAPER 6;AT k
,1;"(ig8:H:ig8:H:ig8:H:ig8)"; IN
K 2; PAPER 0;AT k-1,1;"       L"
811 GO SUB 500
812 RETURN
1000 LET sc=sc+10
1001 BEEP .01,20: BEEP .01,30: B
EEP .01,24
1002 PRINT ; INK 0; PAPER 6;AT q
,1;"(ig8:H:ig8:H:ig8:H:ig8)"; IN
K 2; PAPER 0;AT q-1,1;"       L"
1003 IF q=3 THEN  LET a=0
1004 IF q=9 THEN  LET b=0
1005 IF q=15 THEN  LET c=0
1006 GO SUB 500
1007 RETURN
1999 GO TO 2200
2000 PAPER 5: INK 0: PRINT ; FLA
SH 1; BRIGHT 1;AT 5,5;"YOU SCORE
D ";sc;AT 7,7;"WELL DONE"
2003 STOP
2200 FOR n=2 TO 16: PRINT ; PAPE
R 5; INK 0;AT n,1;"IJIIJII";AT
-1,1;"       ": BEEP .005,-10: N
EXT n
2201 GO TO 2000
6000 PAPER 7: BORDER 7: INK 1: C
LS
6001 PRINT AT 3,0;"  YOU ARE A F
IREMAN,YOUR JOB      IS TO SAVE A
LL THE BABYS         THAT HAVE BE
EN LEFT BEHIND       BEFORE THE F
IRE REACHES          THEM."
6002 PRINT AT 10,3;"UP=(q)";AT 1
1,3;"DOWN=(z)";AT 15,2;"YOU HAVE
 THREE LIVES THEN THE   BUILDING
 WILL CRUMBLE"
6003 PRINT ; INK 0;AT 17,17;"A";
AT 18,17;"B"; INK 5;AT 17,15;"FG
"
6004 PAUSE 0: RETURN
```

WIN A QL!

FIRST PRIZE: A QL COMPUTER

SECOND PRIZE: FIVE SECOND PRIZE WINNERS WILL WIN A DK'TRONICS LIGHT PEN AND KEYBOARD

THIRD PRIZE: TWO THIRD PRIZE WINNERS WILL WIN A RAM QUICKSHOT JOYSTICK AND TURBO INTERFACE

RUNNERS-UP: One hundred runners-up will win a Spectrum game from one of ten top companies. Software from MICROMEGA, ULTIMATE, QUICKSILVA, AUTOMATA, BUG-BYTE, C.C.S., DURELL, P.S.S., NEW GENERATION and ARCADE can be won. Now is your opportunity to win 'Deathchase', 'Codename Mat' and 'Full Throttle' from MICROMEGA, 'Sabre Wulf' from ULTIMATE and best-selling games from any one of the companies listed.

● The **Sinclair QL** computer needs little introduction. The most powerful Sinclair computer yet, it uses the new language Superbasic and has 128K Ram. It comes complete with four major software packages, and is already supported by two magazines and several books. It is the machine that everybody is talking about this year; see how to win one below.

● The **dk'tronics light pen** allows you to produce high-resolution pictures, using sixteen pre-defined instructions. Change paper, border, ink or colour. Draw circles or boxes, fill them in with colour, draw freehand, animate your characters and do much, much more. Meanwhile, the keyboard which third prize winners will also be sent will allow them to use their Spectrum more quickly and efficiently.

● The **Ram Quickshot Joystick** combines all the features you could want in a joystick. Four suction cups hold it to your table, allowing you to play games with one hand only. Two fire buttons allow you to fire either with thumb or forefinger. What is more, with the addition of the **Ram Turbo Interface,** you can plug two joysticks into your Spectrum at once, for a multi-player game. The Turbo Interface also provides a variety of interfaces, allowing you to connect cartridge software or Microdrive to your Spectrum.

HOW TO ENTER

Listed below are six major features of the QL computer. Which of these are most essential in a new computer? Use your skill and judgement to arrange the six points in order of importance. For example, if you feel that a new keyboard is the most essential feature of any new computer, you could write C by number one on your entry form.

A Large amount of memory
B 32 bit processor
C Professional keyboard
D Advanced language
E Built in program storage
F Excellent software

When you have arranged the six points in order of importance, complete the tie-breaking sentence: "I would like to win a Sinclair QL because . . .".

All entries must be submitted on the cardboard entry form inserted in the magazine. They should arrive at "Sinclair Programs" not later than first post October 31st. Employees of EMAP Computer and Business Publications are not eligible to enter. The editor's decision on all matters relating to the competition will be final.

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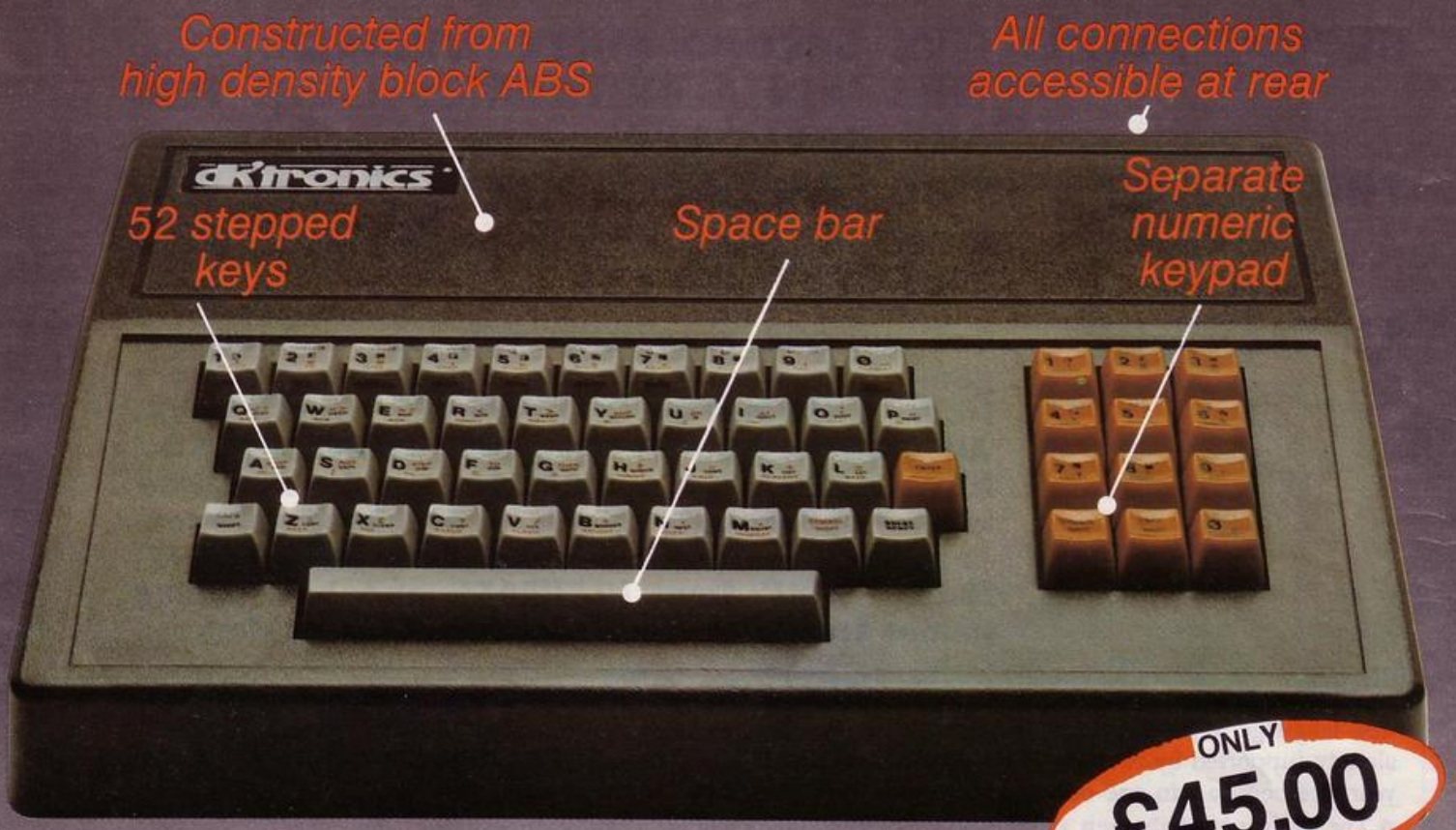

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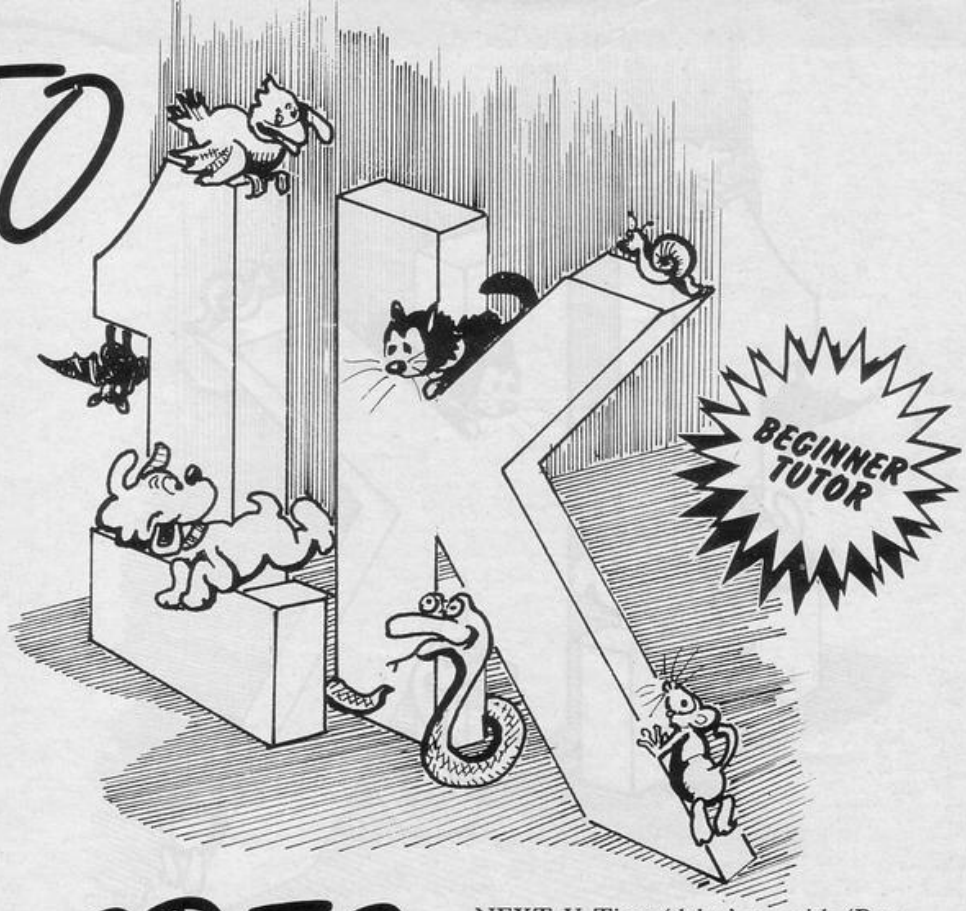
The Spectrum Connection

3 INTO GOES-



THREE INTO 1K GOES is a good example of memory conservation, written for the ZX-81 by M. J. Davies of Llandeilo, Dyfed. The program enables the user to fit three games into 1K of memory so tightly that the mere addition of one character will prevent you from playing Mini-Hurkle.

When the program is run the screen goes blank until you press 1, 2, or 3. **Guess the number** covers figures from 1 to 200. If your number is too high 1 is displayed, too low and −1 is displayed and if correct the number of goes taken is shown. When **Reaction Tester** is played, wait for the screen to turn white and press newline. Your score is then shown in seconds. The last game is **Mini-Hurkle.** Enter the X and Y co-ordinates and the computer will tell you the direction in which the hurkle lies. An "H" is displayed when the hurkle is found.

THIS IS a very compact "3 in 1" program which has been very cleverly designed to fit into 1 K. As such, it is as much a lesson in memory conservation, as in programming.

SUBROUTINES AND MAIN CODE

2-7:	Set up variables and program control (PROG)
8-9:	Random number subroutine (RAND)
20-32:	"Guess the number" Game 1 (GAME1)
40-53:	"Reaction Tester" Game 2 (GAME2)
60-82:	"Mini-Hurkle" Game 3 (GAME3)

VARIABLES

Most of the variables have different uses to save memory. A list of the names will suffice here, as their uses will become apparent in "How it works".

Strings: A$

Numeric variables: N, C, V, R, X, Y, A, B

HOW IT WORKS

The "module" names suggested in the program summary are used for the purpose of describing how the program works. These names have no programming significance.

Prog (Lines 2-7)
Set N=8, C=−1
Select SLOW mode
Clear Screen
IF KEY>0 AND key<4 THEN jump to GAME (Key)
Jump to PROG

Rand (Lines 8-9)
R=INT (RND*V) i.e. any whole number between 0 and V−1
Return

Game1 (Lines 20-32)
Set V=200
CALL RAND
V=R+1 (i.e. 1-200)
Set R=0
Loop
PRINT "?"
INPUT B (Player's guess)
Clear Screen
Print −1 (low), 0 (true)
1 (high)
R=R+1 (no. of goes)
IF B not equal to V
THEN jump to LOOP
Print R
Jump to PROG

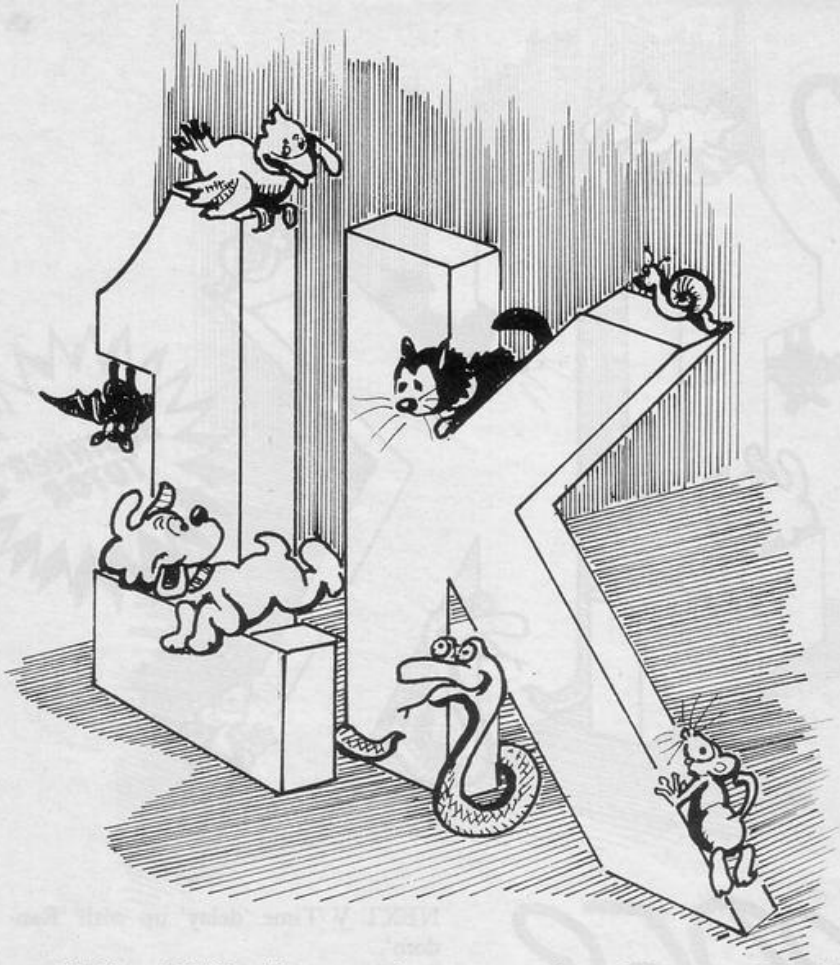
Game2 (Lines 40-53)
Sert FAST mode
Input A$ (waits for player to press any key to start)
Set V=2401
Call RAND (R=0 to 2400)
FOR V=1 to R Random time
NEXT V Time 'delay' up with 'Random'.
Set R=16436 (Systems variable for frame counter)
Poke R, R+C with 255
(i.e. set all 16 bits)
Input A$ (waits for Player to react to end of black screen)
Print ((255-PEEK 16436)+256* (255-PEEK 16437) /50
(i.e. no. of frames sent to screen from start of count /50 frames per sec)
Jump to PROG

Game3 (Lines 60-62)
Set A=0, V=4
Call RAND
Q=R (Hurkle X coord)
Call RAND (R=Hurkle y coord)
FOR A=4 TO STEP −1
Print A, "+++++"
NEXT A
Print "01234" (Grid references)
Input X,Y (Player's guess)
Black out square at 4−Y, X+1
Set A$="" (null string)
IF Y<R THEN A$="N" (North)
IF Y>R THEN A$="S" (South)
IF X<Q THEN A$=A$+"E" (East)
IF X>Q THEN A$=A$+"W" (West)
Print A$
IF Wrong guess
THEN jump to Input X,Y
Clear Screen
Jump to PROG

General Notes

From the memory conservation point of view, there are several devices used here.

1) -COS PI and SIN PI for 1,0. These are good alternatives to the use of



```
  2 LET N=VAL "8"
  3 LET C=-COS PI
  4 SLOW
  5 CLS
  6 IF INKEY$>"0" AND INKEY$<"4
" THEN GOTO VAL INKEY$*CODE "="
  7 RUN
  8 LET R=INT (RND*V)
  9 RETURN
 20 LET V=CODE "COS "
 21 GOSUB N
 22 LET V=R+C
 23 LET R=SIN PI
 24 PRINT "?"
 25 INPUT B
 26 CLS
 27 PRINT B;" ";(B>V)-(B<V)
 28 LET R=R+C
 29 IF B<>V THEN GOTO CODE "/"
 30 PRINT R
 31 INPUT A$
 32 RUN
 40 FAST
 41 INPUT A$
 42 LET V=VAL "7**4"
 43 GOSUB N
 44 FOR V=C TO R
 45 NEXT V
 46 LET V=PEEK INT PI
 47 LET R=VAL "16436"
 48 POKE R,V
 49 POKE R+C,V
 50 INPUT A$
 51 PRINT ((V-PEEK R)+(V+C)*(V-
PEEK (R+C)))/CODE "M"
 52 INPUT A$
 53 RUN
 60 LET A=SIN PI
 61 LET V=VAL "4"
 62 GOSUB N
 63 LET Q=R
 64 GOSUB N
 65 FOR A=V TO A STEP -C
 66 PRINT A;"+++++"
 67 NEXT A
 68 PRINT " 01234"
 69 INPUT X
 70 INPUT Y
 71 LET A$=""
 72 PRINT AT V-Y,X+C;"■"
 73 IF Y<R THEN LET A$="N"
 74 IF Y>R THEN LET A$="S"
 75 IF X<Q THEN LET A$=A$+"E"
 76 IF X>Q THEN LET A$=A$+"W"
 77 PRINT AT A,CODE "■";A$;" "
 78 IF X<>Q OR Y<>R THEN GOTO V
AL "69"
 79 CLS
 80 PRINT "H"
 81 INPUT A$
 82 RUN
```

PI/PI and PI/PI with an extra byte saved when representing zero.

2) Good use is made of the numbers already held in ROM for CODES (0-255). e.g. CODE "COS" gives a saving of 2 bytes on VAL "200".
3) If the number is too large to use (2) above, then see if an operator can be used e.g. VAL"7**4" uses 1 byte less than VAL"2401".

BOUNCE on the trampoline at the bottom of the screen and catapult yourself into the apples. If you miss the trampoline on your descent the game will end. The birds that are dotted about the screen should be avoided as any contact will result in the loss of a life.

Scrumper was written for the 16K Spectrum by Roy Farrington, aged 13, of Bolton, Greater Manchester.

```
  10 FOR y=-60 TO 60: BEEP .01,y
: NEXT y
  20 PRINT  AT 2,12;"SCRUMPER"

  30 GO SUB 530
  40 BORDER 6: PAPER 5
  50 LET e=0: LET f=0: LET a=10:
LET b=15: LET p=0: LET t=0: LET
 s=0: LET l=3
  60 INPUT "ENTER SPEED (1 TO 7)
";g
  70 IF g<1 OR g>7 THEN  GO TO 1
93
  80 LET g=(g/(g*2^g)*0.2)
  90 PAUSE 100: CLS
 100 GO SUB 430
 110 LET c=3+ INT ( RND *10)
 120 LET d=1+ INT ( RND *31)
 130 PRINT  INK 1; AT c,d;"D"
 140 LET w=0
 150 PRINT  INK 2; AT a,b;"B": B
EEP g,4
 160 PRINT  AT 0,0;"LIVES=";l
 170 IF a=21 THEN  GO TO 490
 180 PRINT  AT a,b;" "
 190 IF l <= 0 THEN  GO TO 470

 200 IF  INKEY$ ="5" THEN  LET b
=b-1
 210 IF  INKEY$ ="8" THEN  LET b
=b+1
 220 LET a=a+1
 230 IF  ATTR (a,b)=44 THEN  BEE
P .1,5: LET s=s+10
 240 IF  ATTR (a,b)=41 THEN  BEE
P .1,1: LET l=l-1
 250 IF  ATTR (a+1,b)=43 THEN  G
O TO 270
 260 GO TO 150
 270 LET e=3+ INT ( RND *10)
 280 LET f=1+ INT ( RND *30)
 290 PRINT  INK 4; AT e,f;"C"
 300 PRINT  INK 2; AT a,b;"B": B
EEP g,4
 310 IF a=19 THEN  GO SUB 430
 320 PRINT  AT a,b;" "
 330 IF  INKEY$ ="5" THEN  LET b
=b-1: LET w=w+1.5
 340 IF  INKEY$ ="" THEN  LET w=
w+1
 350 IF  INKEY$ ="8" THEN  LET b
=b+1: LET w=w+1.5
 360 LET a=a-1
 370 IF  ATTR (a,b)=44 THEN  BEE
P .1,5: LET s=s+10
 380 IF  ATTR (a,b)=41 THEN  BEE
P .1,1: LET l=l-1
 390 PRINT  AT 0,0;"LIVES=";l
 400 IF w >= 20 THEN  GO TO 110
 410 IF l <= 0 THEN  GO TO 470

 420 GO TO 300
 430 LET v= INT ( RND *24)
 440 PRINT  AT 21,0;"
                    "
 450 PRINT  INK 3; AT 21,v;"AAAA
AAAA"
 460 RETURN
 470 PRINT  AT 6,6;"THE BIRDS GO
T YOU"
 480 GO TO 500
 490 PRINT  AT 6,6;"YOU MISSED T
HE TRAMPOLINE"
 500 FOR y=1 TO 60: BEEP .01,y:
NEXT y
 510 PRINT  AT 8,6;"SCORE=";s
 520 GO TO 40
 530 FOR f=0 TO 3: FOR g=0 TO 7:
 READ a: POKE  USR  CHR$ (144+f)
+g,a: NEXT g: NEXT f
 540 DATA 255,129,66,36,24,24,36
,66
 550 DATA 0,24,24,60,90,24,36,36

 560 DATA 0,24,48,126,126,118,60
,0
 570 DATA 0,14,8,56,112,32,32,48
 580 RETURN
```

WEATHER PREDICTOR

AFTER entering the day's weather, a forecast for the next day will be given. The computer will prompt you to enter the relevant information; including the wind speed and humidity. The author claims that forecasts given are as reliable as those given on the television.

Weather Predictor was written for the 1K ZX-81 by Wayne Phipps of Narborough, Leicester.

```
    1 LET SN=7
    2 LET SU=0
    3 LET RA=5
    4 LET DU=2
    5 PRINT "WEATHER?(SN,SU,RA,DU
)"
   10 INPUT W
   11 PRINT "WIND?(1 TO 10)"
   12 INPUT F
   19 PRINT "FORCAST?-1=SUN,3=DUL
L,4=RAIN,   5=SNOW"
   30 INPUT B
   40 PRINT "I PREDICT:"
   50 LET M=B*3
   60 LET O=(M+F+W)
   70 IF O<=13 THEN PRINT "SUN"
   80 IF O>=14 AND O<=18 THEN PRI
NT "DULL"
   90 IF O>=19 AND O<=28 THEN PRI
NT "RAIN"
  100 IF O>28 THEN PRINT "SNOW"
  110 INPUT A$
  120 CLS
  130 RUN
```

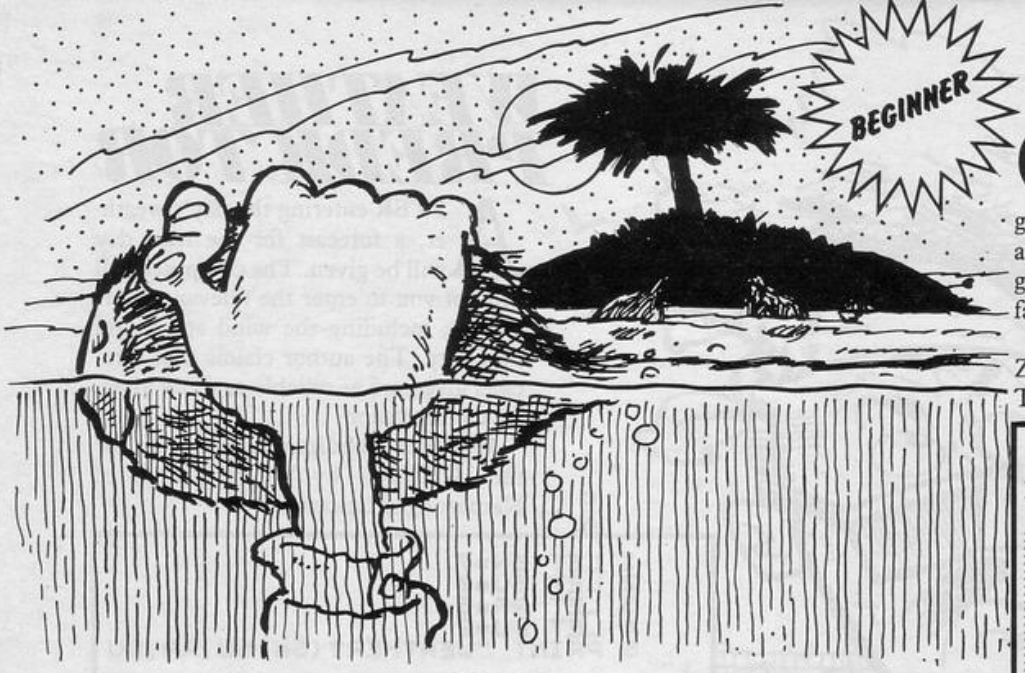
3D WALL

BUILD A wall from the top of the screen to the bottom, taking care to avoid the poles and sides of the screen. When you reach the bottom you have to build another wall, only this time you are able to choose your starting point.

3D Wall was written for the 16K Spectrum by Philip Laflin, aged 13 of Rotherham, S. Yorks.

```
   9 BORDER 2: PAPER 4: INK 0: C
LS
  10 LET sc=0: LET l=0: LET le=0
: GO TO 1000
  20 LET s=100: LET a=165
  21 PLOT 0,0: DRAW 0,175: PLOT
255,0: DRAW 0,175
  25 PLOT s,a: DRAW 5,5: IF  INK
EY$ ="s" THEN  PAUSE 4e4
  26  IF  INKEY$ ="p" AND s<255
THEN  LET s=s+1: BEEP .030,-10:
LET j=j+1: LET sc=sc+1: IF  POIN
T (s+1,a)=1 THEN  CLS : PRINT  A
T 10,2;"HARD LUCK,YOU HIT ITS SI
DE": BEEP 4,-20: CLS : GO TO 100
0
  27 IF  INKEY$ ="o" THEN  BEEP
.030,-10: LET s=s-1: LET sc=sc+1
: LET j=j+1: IF  POINT (s-1,a)=1
 THEN  CLS : PRINT  AT 10,2;"HAR
D LUCK,YOU HIT ITS SIDE": BEEP 4
,-20: CLS : GO TO 1000
  28 IF  INKEY$ ="" AND a>14 THE
N  BEEP .015,-10: LET a=a-1: LET
 j=j+1: LET sc=sc+1: IF . POINT (
s,a-1)=1 THEN  CLS : PRINT  AT 1
0,0;"HARD LUCK YOU BANGED INTO A
 WALL": BEEP 4,-20: CLS : GO TO
1000
  29 PLOT 0,18: DRAW 255,0
  30 IF a=20 THEN  LET a=165: BE
EP .10,-20: LET l=l+1: PRINT  AT
 0,0;"LEVEL ";l: PRINT  AT 0,9;"
SCORE ";sc: INPUT "HOW FAR ACROS
S TO BUILD ?(your first wall was
 100 across) ";u: LET s=u
 999 GO TO 25
1002 CLS : PRINT  AT 0,0;"
  3D WALL       ": FOR f=7 TO 0 S
TEP -1: PRINT  AT 12,0; INK f;"U
SE S TO PAUSE"
1003 PRINT  AT 2,1; INK f;"BUILD
 THE WALL DOWN TO THE "'"BOTTOM
WHERE YOU WILL BUILD A"'"NOTHER
WALL AT THE TOP ."''"USE KEYS O-
left P-right"''"BUT BEWARE! DO N
OT BUMP INTO"'"OLD WALLS OR POLE
S AS THIS"'"WILL CAUSE AN EXTERM
INATION!!"
1004 PRINT  AT 15,4; INK f;"PREV
IOUS SCORE ";sc: PRINT  AT 17,4;
 INK f;"PREVIOUS LEVEL ";l: PRIN
T  AT 20,4; INK f;"PRESS A KEY T
O START"
1005 NEXT f: PAUSE 4e4: CLS
1006 FOR f=0 TO 100: LET h= RND
*140: LET j= RND *245: BEEP .02,
5: PLOT j,h: DRAW 10,10: NEXT f

1007 LET l=1: LET sc=0: GO TO 20
```

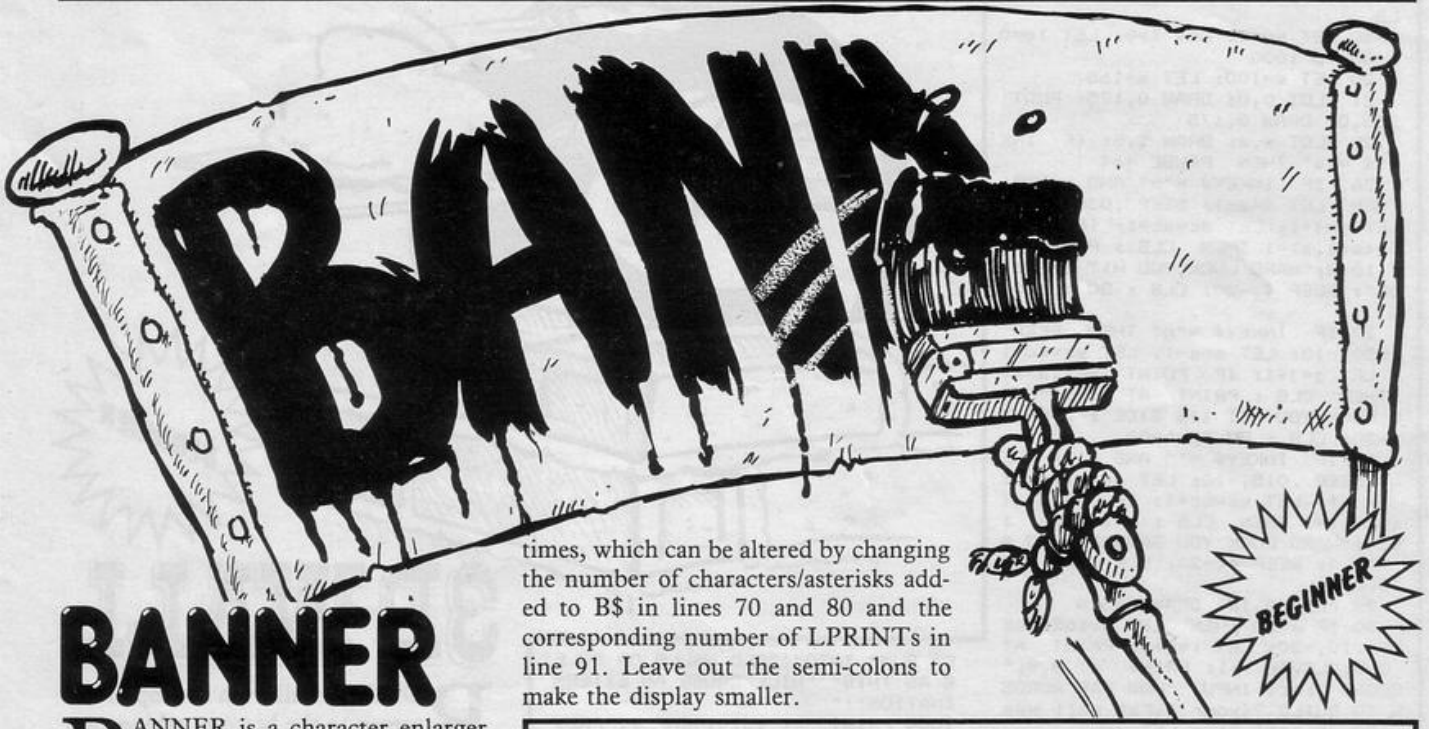


COCONUTS

COLLECT the coconuts from the tree at the end of your garden by jumping over the gaps in the ground. Each time you move a new gap appears. The river runs below your garden so if you misjudge a gap you will fall into it. The keys to use are 5 and 0.

Coconuts was written for the 16K ZX-81 by Neil Yates, aged 13, of Thame, Oxon.

```
  3 SAVE "COCONUT"
  4 LET HI=500
  5 CLS
 10 LET S=0
 20 LET F$="
"
 30 PRINT "  WHICH SKILL LEVEL
?"
 31 PRINT
 32 PRINT "( 1-5:1 IS HARD )"
 35 INPUT SL
 36 IF SL<1 OR SL>5 THEN GOTO 3
5
 37 CLS
 40 PRINT AT 0,5;"COCONUTS **"
 45 PRINT AT 14,0;"
 46 PRINT AT 13,0;"
 47 PRINT AT 12,0;"
 48 PRINT AT 11,0;"
 49 PRINT AT 10,0;"
 50 PRINT AT 9,0;"
 55 PRINT AT 14,28;"
";AT 13.
27;"
";AT 12,29;"
"
 60 LET Y=25
 70 PRINT AT 15,0;F$
 80 PRINT AT 14,Y;"A"
 90 IF INKEY$="0" THEN GOSUB 50
0
100 IF F$(Y+1)=" " THEN GOTO 20
00
110 PRINT AT 14,Y;" "
120 IF INKEY$="5" THEN LET F$(Y
+1)="
"
125 IF INKEY$="5" THEN LET Y=Y-
1
130 IF Y<=5 THEN GOTO 1000
140 LET S=S+1
150 GOTO 70
500 LET F$(Y+1)=" "
510 PRINT AT 14,Y;" ";AT 13,Y-1
;"A";AT 13,Y-1;" ";AT 13,Y-2;"A"
;AT 13,Y-2;" ";AT 14,Y-3;"A"
520 LET Y=Y-3
530 RETURN
1000 FOR F=10 TO 14
1010 PRINT AT F,5;"0"
1020 PRINT AT F,5;" "
1030 NEXT F
1040 LET S=S+100
1050 FOR F=1 TO SL*3
1060 LET LL=INT (RND*18)+7
1070 LET F$(LL)="
"
1080 NEXT F
1085 LET L=INT (RND*18)+7
1086 LET F$(L)=" "
1090 LET F$(24)="
"
1095 LET F$(26)="
"
1100 LET F$(25)="
"
1110 GOTO 37
2000 FOR F=1 TO 15
2005 PRINT AT 7,15;"
2010 PRINT AT 6,14;"
";AT 7,13
;"
";AT 8,14;"
2020 PRINT AT 6,14;"
";AT 7,13
;"
";AT 8,14;"
2025 PRINT AT 7,13;"(
) "
2030 NEXT F
2040 CLS
2050 PRINT "   YOU FELL INTO THE
 RIVER AND"
2060 PRINT "WERE SWEPTED AWAY."
2070 PRINT
2080 PRINT " YOU SCORED ";S;" PO
INTS."
2090 PRINT
2100 IF S>HI THEN LET HI=S
2110 PRINT "THE HI-SCORE TODAY I
S ";HI
2115 PRINT
2120 PRINT " PRESS ANY KEY TO TR
Y AGAIN."
2130 PAUSE 4E4
2140 GOTO 10
```



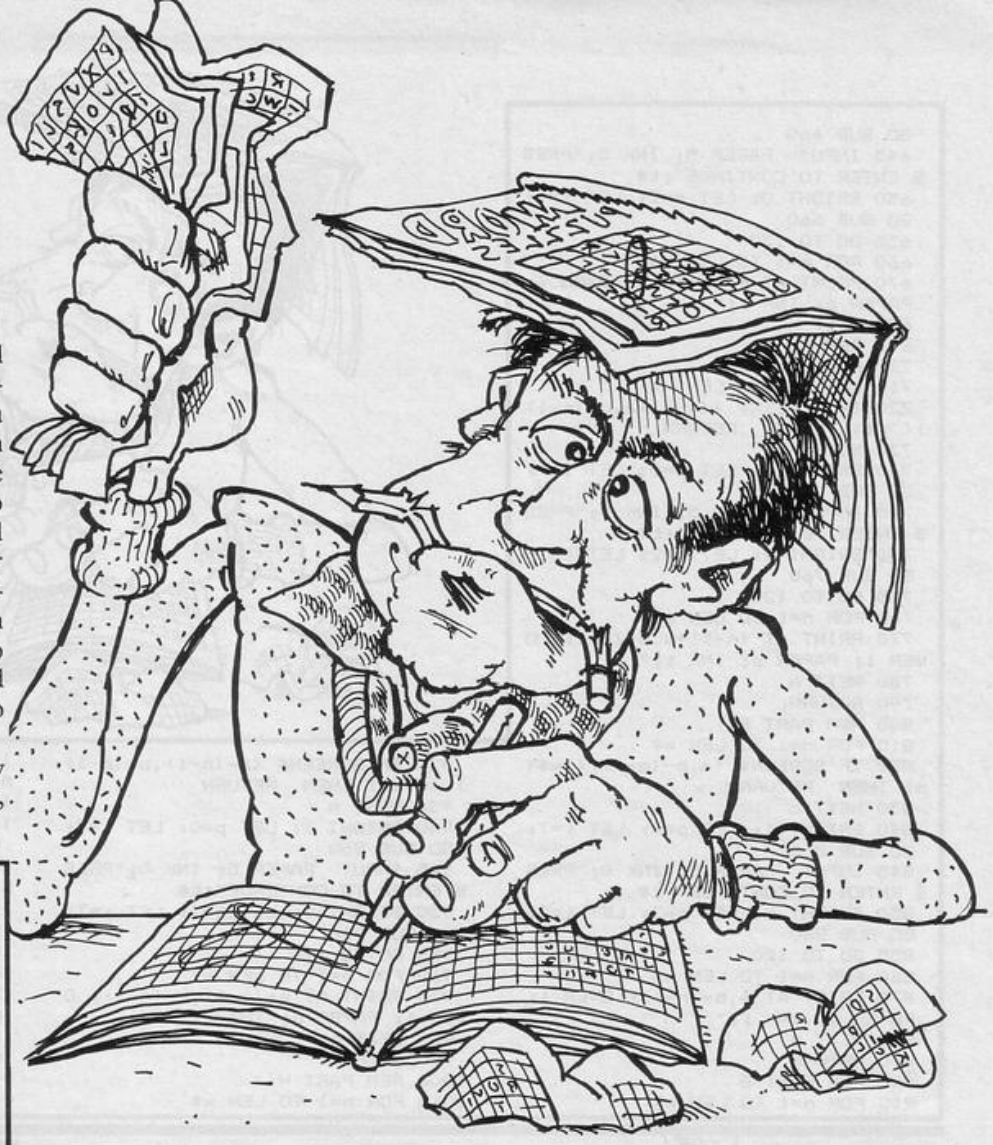
BANNER

BANNER is a character enlarger written for the 1K ZX-81 with printer attached by David Blackburn of Smallfield, Surrey.

It produces a banner from the string in line 20 and this is copied directly to the printer. The contents of this string may be changed to suit your requirements. Each character is enlarged 1024 times, which can be altered by changing the number of characters/asterisks added to B$ in lines 70 and 80 and the corresponding number of LPRINTs in line 91. Leave out the semi-colons to make the display smaller.

```
 10 DIM H(8)
 20 LET A$="LIFE THE UNIVERSE A
ND EVERYTHING: - 42 - THE ULTIMA
TE ANSWER?"
 25 FOR A=1 TO LEN A$
 30 LET E=7688+8*CODE A$(A)
 35 FOR X=1 TO 8
 40 LET H(X)=PEEK (E-X)
 45 NEXT X
 50 LET C=128
 55 FOR Y=1 TO 8
 60 LET B$=""
 65 FOR X=1 TO 8
 66 LET D=H(X)
 70 IF D>=C THEN LET B$=B$+"***
*"
 75 IF D>=C THEN LET H(X)=H(X)-
C
 80 IF D<C THEN LET B$=B$+"
"
 85 NEXT X
 86 LET C=C*.5
 91 LPRINT B$;B$;B$;B$;
 93 NEXT Y
100 NEXT A
```

PUZZLE SOLVER



PUZZLE SOLVER is a useful program to help find the solutions to puzzles in which you have to pick out words from amongst a group of letters in a grid. Input the measurements of the grid, any size up to a maximum of thirty letters across and twenty characters down, and then enter the letters on each row. The information is shown in the grid and you can then enter a word for the computer to find. The computer scans the grid and if a word cannot be found, asks you to try again.

Written for the 48K Spectrum by Christopher Miles, aged 12, of Egham, Surrey.

```
  1 POKE 23658,8
  2 BORDER 1: PAPER 1: INK 7: C
LS
  3 PRINT AT 8,0; PAPER 6; INK
0;"  DO YOU WISH TO CONTINUE WIT
H       THE LAST INFORMATION ?
  "
  4 PRINT  PAPER 0; INK 6;"
         OR                "
  5 PRINT  PAPER 6; INK 0;"
    START AGAIN
 AND ENTER NEW LETTERS       "
  6 PRINT  PAPER 0; INK 6;" C t
o CONTINUE/S to START AGAIN "
  7 INPUT c$: IF C$="C" THEN  G
O TO 85
  9 REM SIZE OF GRID
 10 INPUT "AMOUNT OF LETTERS AC
ROSS (1-30)?";x
 15 IF x>30 OR x<1 THEN  GO TO
10
 20 INPUT "AMOUNT OF LETTERS DO
WN (1-20)?";y
 21 IF y>20 OR y<1 THEN  GO TO
20
 25 REM ENTERING THE LETTERS
 30 DIM a$(y,x)
 40 FOR n=1 TO y
 50 PRINT AT 10,5; PAPER 5; INK
0;"LETTERS IN ROW ";n
 55 INPUT r$
 60 IF LEN r$<x THEN  GO TO 50
 70 LET a$(n)=r$( TO x)
 80 NEXT n
 81 REM PRINTIN THE LETTERS
 85 CLS
 90 FOR n=1 TO y
100 PRINT AT n,16-INT (x/2); PA
PER 6; INK 0;a$(n)
110 NEXT n
115 REM FIND WORD
116 REM PART 1
121 INPUT  PAPER 5; INK 0;"ENTE
R WORD ";w$
122 IF LEN w$<2 THEN  GO TO 121
123 PRINT AT 21,0;"
                  "
125 LET d=16-INT (LEN w$/2): PR
INT AT 21,d-1; PAPER 4; INK 0;"
";w$;" "
130 INK 0: PLOT (d*8)-8,0: DRAW
0,7: DRAW ((LEN w$)*8)+16,0: DR
AW 0,-7: DRAW -(((LEN w$)*8)+16)
,0: INK 7
140 FOR a=1 TO y
150 FOR b=16-INT (x/2) TO x+(15
-INT (x/2))
151 LET p=6: LET i=0
152 IF ATTR (a,b)=23 THEN  LET
p=2: LET i=7
153 PRINT AT a,b; OVER 1; PAPER
0; INK 6;" "
160 IF SCREEN$ (a,b)=w$(1) THEN
 GO SUB 200
165 PRINT AT a,b; OVER 1; PAPER
p; INK i;" "
166 BEEP .01,b*2
170 NEXT b: NEXT a
180 PRINT AT 21,0; PAPER 5; INK
0;" SORRY WORD NOT FOUND TRY AG
AIN "
185 PAUSE 100: PRINT AT 21,0;"
                              "
190 GO TO 120
200 REM PART 2
210 IF SCREEN$ (a-1,b+1)=w$(2)
THEN  GO SUB 300
220 IF SCREEN$ (a,b+1)=w$(2) TH
EN  GO SUB 400
230 IF SCREEN$ (a+1,b+1)=w$(2)
THEN  GO SUB 500
240 IF SCREEN$ (a+1,b)=w$(2) TH
EN  GO SUB 600
250 IF SCREEN$ (a+1,b-1)=w$(2)
THEN  GO SUB 700
260 IF SCREEN$ (a,b-1)=w$(2) TH
EN  GO SUB 800
270 IF SCREEN$ (a-1,b-1)=w$(2)
THEN  GO SUB 900
280 IF SCREEN$ (a-1,b)=w$(2) TH
EN  GO SUB 1000
285 RETURN
300 REM PART A
310 FOR n=1 TO LEN w$
320 IF SCREEN$ (a-(n-1),(n-1)+b
)<>w$(n) THEN  RETURN
330 NEXT n
340 BRIGHT 1: LET p=0: LET i=7:
GO SUB 360
345 INPUT  PAPER 5; INK 0;"PRES
S ENTER TO CONTINUE";t$
350 BRIGHT 0: LET p=2: LET i=7:
GO SUB 360
355 GO TO 120
360 FOR n=1 TO LEN w$
370 PRINT AT a-(n-1),(n-1)+b; O
VER 1; PAPER p; INK i;" "
380 NEXT n
390 RETURN
400 REM PART B
410 FOR n=1 TO LEN w$
420 IF SCREEN$ (a,(n-1)+b)<>w$(
n) THEN  RETURN
430 NEXT n
440 BRIGHT 1: LET p=0: LET i=7:
GO SUB 460
445 INPUT  PAPER 5; INK 0;"PRES
S ENTER TO CONTINUE";t$
450 BRIGHT 0: LET p=2: LET i=7:
GO SUB 460
455 GO TO 120
460 FOR n=1 TO LEN w$
470 PRINT AT a,(n-1)+b; OVER 1;
PAPER p; INK i;" "
480 NEXT n
490 RETURN
500 REM PART C
510 FOR n=1 TO LEN w$
520 IF SCREEN$ ((n-1)+a,(n-1)+b
)<>w$(n) THEN  RETURN
530 NEXT n
540 BRIGHT 1: LET p=0: LET i=7:
GO SUB 560
545 INPUT  PAPER 5; INK 0;"PRES
S ENTER TO CONTINUE";t$
550 BRIGHT 0: LET p=2: LET i=7:
GO SUB 560
555 GO TO 120
560 FOR n=1 TO LEN w$
570 PRINT AT (n-1)+a,(n-1)+b; O
VER 1; PAPER p; INK i;" "
580 NEXT n
590 RETURN
600 REM PART D
610 FOR n=1 TO LEN w$
620 IF SCREEN$ ((n-1)+a,b)<>w$(
n) THEN  RETURN
630 NEXT n
640 BRIGHT 1: LET p=0: LET i=7:
```

```
 GO SUB 660
 645 INPUT  PAPER 5; INK 0;"PRES
S ENTER TO CONTINUE";t$
 650 BRIGHT 0: LET p=2: LET i=7:
 GO SUB 660
 655 GO TO 120
 660 FOR n=1 TO LEN w$
 670 PRINT AT (n-1)+a,b; OVER 1;
 PAPER p; INK i;" "
 680 NEXT n
 690 RETURN
 700 REM PART E
 710 FOR n=1 TO LEN w$
 720 IF SCREEN$ ((n-1)+a,b-(n-1)
)<>w$(n) THEN  RETURN
 730 NEXT n
 740 BRIGHT 1: LET p=0: LET i=7:
 GO SUB 760
 745 INPUT  PAPER 5; INK 0;"PRES
S ENTER TO CONTINUE";t$
 750 BRIGHT 0: LET p=2: LET i=7:
 GO SUB 760
 755 GO TO 120
 760 FOR n=1 TO LEN w$
 770 PRINT AT (n-1)+a,b-(n-1); O
VER 1; PAPER p; INK i;" "
 780 NEXT n
 790 RETURN
 800 REM PART F
 810 FOR n=1 TO LEN w$
 820 IF SCREEN$ (a,b-(n-1))<>w$(
n) THEN  RETURN
 830 NEXT n
 840 BRIGHT 1: LET p=0: LET i=7:
 GO SUB 860
 845 INPUT  PAPER 5; INK 0;"PRES
S ENTER TO CONTINUE";t$
 850 BRIGHT 0: LET p=2: LET i=7:
 GO SUB 860
 855 GO TO 120
 860 FOR n=1 TO LEN w$
 870 PRINT AT a,b-(n-1); OVER 1;
 PAPER p; INK i;" "
 880 NEXT n
 890 RETURN
 900 REM PART G
 910 FOR n=1 TO LEN w$
 920 IF SCREEN$ (a-(n-1),b-(n-1)
)<>w$(n) THEN  RETURN
 930 NEXT n
 940 BRIGHT 1: LET p=0: LET i=7:
 GO SUB 960
 945 INPUT  PAPER 5; INK 0;"PRES
S ENTER TO CONTINUE";t$
 950 BRIGHT 0: LET p=2: LET i=7:
 GO SUB 960
 955 GO TO 120
 960 FOR n=1 TO LEN w$
 970 PRINT AT a-(n-1),b-(n-1); O
VER 1; PAPER p; INK i;" "
 980 NEXT n
 990 RETURN
1000 REM PART H
1010 FOR n=1 TO LEN w$
1020 IF SCREEN$ (a-(n-1),b)<>w$(
n) THEN  RETURN
1030 NEXT n
1040 BRIGHT 1: LET p=0: LET i=7:
 GO SUB 1060
1045 INPUT  PAPER 5; INK 0;"PRES
S ENTER TO CONTINUE";t$
1050 BRIGHT 0: LET p=2: LET i=7:
 GO SUB 1060
1055 GO TO 120
1060 FOR n=1 TO LEN w$
1070 PRINT AT a-(n-1),b; OVER 1;
 PAPER p; INK i;" "
1080 NEXT n
1090 RETURN
9998 STOP
9999 SAVE "SOLUTION" LINE 1
```

Bird Drop

DROP as many eggs as you can onto the flowers below before the bird lands. Ten points are given when a flower is hit but if you miss and waste an egg five points will be deducted. To release an egg use key "d".

Bird Drop was written for the 16K Spectrum by David Yates of Higher Irlam, Manchester.

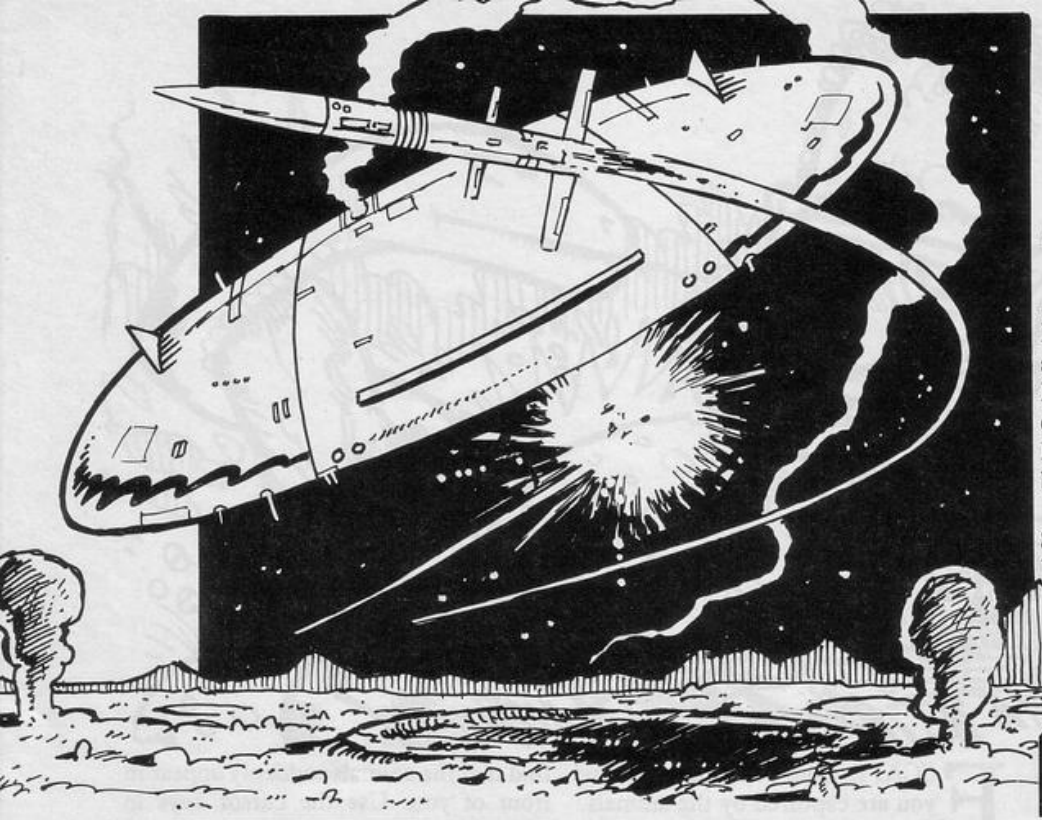
```
  10 BORDER 0: PAPER 0: INK 7: C
LS : FOR a=0 TO 63: READ b: POKE
 USR "a"+a,b: NEXT a
  30 PRINT AT 0,10; FLASH 1;"Bir
d Drop"
  50 PRINT AT 5,0;"The idea of t
he game is to drop eggs on as ma
ny flowers (G) as  possible befo
re the bird lands."
  60 PRINT AT 9,0;"Points are aw
arded for each hit ,while misses
 are deducted from your score."
  70 PRINT AT 13,4;"Use 'd' to f
ire an egg.";AT 15,2;"Press any
key to continue.": PAUSE 0
  80 BORDER 2: PAPER 7: INK 0: C
LS : GO SUB 1000
  90 FOR a=0 TO 4: LET b=INT (RN
D*30): PRINT AT 19,b; INK 4;"G";
AT 20,b; INK 3;"H": NEXT a
 100 LET y=2: LET s=0: PRINT AT
0,10;"Score=0"
 120 FOR x=29 TO 0 STEP -1: PRIN
T AT y,x;"ABC";AT y-1,x+1;"D";AT
 y+1,x+1;"E": IF INKEY$="d" OR I
NKEY$="D" THEN  GO SUB 3000
 130 BEEP .01,15: PRINT AT y,x;"
   ";AT y-1,x+1;" ";AT y+1,x+1;"
": NEXT x
 140 LET y=y+2: IF y=20 THEN  GO
 TO 2000
 150 GO TO 110
1000 PRINT AT 21,0; PAPER 5;"
                              ":
RETURN
2000 PRINT AT 0,10; INK 0; PAPER
 7; FLASH 1;"Score=";s;AT 5,6; I
NK 6; PAPER 0;"Another go (y/n)
?": INPUT e$: LET e$=e$( TO 1)
2030 IF e$="y" OR e$="Y" THEN  G
O TO 80
2040 GO TO 9080
3000 FOR d=y+2 TO 18: PRINT AT d
,x+1;"F": BEEP .05,-5: PRINT AT
d,x+1;" ": NEXT d: GO SUB 4000:
RETURN
4000 IF ATTR (19,x+1)=60 THEN  L
ET s=s+15: BEEP .3,40: FOR z=7 T
O 3 STEP -1: PRINT AT 20,x+1; IN
K z;"H": PAUSE 5: NEXT z
4010 PRINT AT 0,16;"     ": BEEP
.2,30: LET s=s-5: PRINT AT 0,10;
"Score=";s: RETURN
9000 DATA 0,0,255,63,15,0,0,0
9010 DATA 24,255,255,255,126,60,
36,36
9020 DATA 0,0,255,252,240,0,0,0
9030 DATA 0,60,66,102,90,90,36,2
4
9040 DATA 36,36,90,153,0,0,0,0
9050 DATA 0,0,60,126,126,60,0,0
9060 DATA 24,36,36,24,16,84,56,1
6
9070 DATA 255,255,126,126,126,12
6,60,60
```

JUNGLE TROUBLE

ESCAPE from the jungle before you are captured by the animals. As you reach the edge of the jungle you will move into denser growth and be confronted by more animals. Do not move too fast as you may find that the animals suddenly appear in front of you. Use the cursor keys in your bid to escape.

Jungle Trouble was written for the 16K Spectrum by Andrew Toumazou, London W3.

```
   1 BORDER 0: PAPER 0: INK 7: C
LS
   2 LET sc=0
   3 LET li=3
   6 FOR n=0 TO 7: READ data: DA
TA BIN 00111000,BIN 00101000,BIN
 00111000,BIN 00010000,BIN 11111
110,BIN 00010000,BIN 00101000,BI
N 01000100: POKE USR "a"+n,data:
 NEXT n
   7 FOR n=0 TO 7: READ data: DA
TA BIN 00111100,BIN 01111110,BIN
 11011011,BIN 11011011,BIN 11111
111,BIN 11111111,BIN 11000011,BI
N 01111110: POKE USR "b"+n,data:
 NEXT n
   9 GO SUB 700
  10 LET a=INT (RND*2)+1
  20 LET b=INT (RND*30)
  30 PRINT AT a,b;"A"
  31 PRINT AT a,b;"A"
  32 PRINT AT a,b;"A"
  35 LET aa=a: LET bb=b
  40 IF INKEY$="6" THEN  LET a=a
+1: LET sc=sc+1: BEEP .1,2
  60 IF INKEY$="8" THEN  LET b=b
+1: LET sc=sc+1: BEEP .1,3
  70 IF INKEY$="5" THEN  LET b=b
-1: LET sc=sc+1: BEEP .1,1
  77 IF SCREEN$ (a+1,b)<>" " THE
N  GO TO 500
  80 PRINT AT aa,bb;" "
  83 LET d=INT (RND*18)+3
  84 LET c=INT (RND*30)+1
  90 IF a=0 THEN  BEEP .2,3: BEE
P .2,4: BEEP .2,5: BEEP .2,2: LE
T li=li-1: GO TO 10
  95 IF li=0 THEN  CLS : GO TO 5
10
 100 IF b=0 OR b=31 THEN  BEEP .
2,3: BEEP .2,4: BEEP .2,3: BEEP
.2,2: LET li=li-1: GO TO 10
 105 IF a=18 THEN  BEEP .10,10:
BEEP .10,9: GO TO 10
 110 PRINT AT d,c; INK 4;"BBB"
 200 PRINT AT 21,0; PAPER 2;"  S
CORE=";sc;"  "
 210 PRINT AT 21,10; PAPER 2;"
    LIVES=";li;"          "
 499 GO TO 30
 500 LET li=li-1: CLS : BEEP .3,
4: BEEP .1,4: BEEP .2,4: BEEP .3
,4: GO TO 10
 510 PRINT AT 10,10;"SCORE=";sc
 520 PRINT AT 12,10;"ANOTHER GO(
Y/N)"
 530 IF INKEY$="y" THEN  CLS : R
UN
 540 IF INKEY$="n" THEN  CLS : S
TOP
 600 GO TO 530
 700 PRINT AT 0,5; PAPER 2;"JUNG
LE TROUBLE!!"
 710 PRINT AT 3,5; INK 4;"USE TH
E CURSOR KEYS TO          MOVE T
O THE BOTTOM OF           THE JU
NGLE BEFORE THE           ANIMAL
S CAPTURE YOU.": BEEP .50,10
 750 PRINT AT 21,5;"PRESS ANY KE
Y"
 800 PAUSE 0: CLS
1000 GO TO 10
```



MINESTORM

DESTROY the enemy flying overhead by launching and steering your missiles at them. Press "0" when you are near the enemy and try to catch them in the explosion. If you hit one of the mines left in the enemy's trail your missile will explode, leaving the enemy free to bomb your base.

Minestorm was written for the 16K Spectrum by Ian Dando, aged 16, of Leigh, Lancs.

```
   2 RESTORE : GO SUB 9000: LET
hi=0: LET h$="ODNADSOFT II": GO
SUB 7000
   4 LET k=5
   5 LET sc=0: LET lives=3
   6 BORDER 4: PAPER 5: CLS
   7 LET p=15
  12 PRINT AT 21,0; PAPER 4; BRI
GHT 1;"
      "
  13 LET y=17: LET p=p+1: IF p>=
27 THEN  LET p=27: LET k=k-.25:
IF k<=.5 THEN  LET k=.5
  14 LET x=p: PRINT AT 21,0; PAP
ER 4; BRIGHT 1; INK 1;" SCORE:";
AT 21,7;sc
  15 PRINT AT 20,p-2; INK 0; PAP
ER 5;" HHH";AT 19,p-2; INK 2;" D
"; INVERSE 1;"G"; INVERSE 0;"E";
AT 18,p-1; INK 1;" I"
  17 PRINT AT 21,23; PAPER 4; BR
IGHT 1; INK 1;"LIVES:"; INK 0; I
NVERSE 1;("III" AND lives=3);("I
I" AND lives=2);("I" AND lives=1
)
  20 PRINT AT 19,0; INK 3;"D"; I
NK 7; PAPER 0;"(4*g6)"; INK 3; P
APER 5;"E";AT 20,0; INVERSE 1;"E
"; PAPER 0;"BASE"; PAPER 5;"D"
  21 PRINT AT 18,1; INVERSE 1; I
NK 4; PAPER 0;"↑↑↑↑"
  22 PRINT AT 17,1; INK 7;"GGGG"
  40 LET r=INT (RND*11)+2
  50 FOR c=30 TO 3 STEP -1
  55 LET y=y-1
  56 IF y<=-1 THEN  LET y=16: PR
INT AT 0,x;" ": LET x=p
  60 PRINT AT y+1,x;" "
  61 PRINT AT r,c; INK 0;"B "
  62 IF RND<.4 THEN  BEEP .005,3
3: PRINT AT r,c+1; FLASH 1; PAPE
R 6; INK 1;"M"
 101 LET x=x+(INKEY$="7" AND x<3
1)-(INKEY$="6" AND x>0)
 111 IF INKEY$="0" THEN  GO SUB
3000
 112 IF INKEY$="9" THEN  LET y=y
+1
 115 PAUSE k
 120 BEEP .005,y
 130 IF ATTR (y,x)=241 THEN  GO
SUB 3000
 135 PRINT AT y,x; INK 2;"A"
 160 NEXT c
 165 PRINT AT y,x;" "
 167 PRINT AT r,4;" "
 170 FOR f=r TO 16
 180 PRINT AT f,3; INK 0;"F": BE
EP .1,f-(f*2)
 185 PRINT AT f,3;" "
 190 NEXT f
 195 PRINT AT f-1,3;" "
 200 FOR f=1 TO 8
 210 PRINT AT INT (RND*4)+17,INT
 (RND*4)+1; FLASH 1; PAPER 6; IN
K 2;"C"
 220 NEXT f
 225 FOR f=1 TO 100
 230 BEEP .002,INT (RND*60)
 240 NEXT f
 245 LET lives=lives-1: IF lives
<=0 THEN  GO TO 250
 247 GO TO 6
 250 FOR c=0 TO 21: PRINT  PAPER
 6; INK 1;"MMMMMMMMMMMMMMMMMMMMM
MMMMMMMMMMM": POKE 23692,255: NE
XT c
 260 BORDER 4: PAPER 4: INK 3: F
LASH 1
 270 CLS
 280 PRINT AT 5,7; FLASH 1; PAPE
R 0; INK 7;"Your score was ";sc
 290 IF sc>hi THEN  LET hi=sc: P
RINT AT 10,3; PAPER 0; INK 7;"WE
LL DONE ,A NEW HIGH SCORE": INPU
T "Please enter your name";h$: G
O TO 350
 300 PRINT AT 10,5; PAPER 0; INK
 7;"THE HIGH SCORE IS ";HI;AT 12
,15;"BY";AT 15,10;H$
 350 PRINT AT 20,1; PAPER 0; INK
 7;"WOULD YOU LIKE ANOTHER GAME
?";AT 21,12;"(Y/N)"
 360 IF INKEY$="y" THEN  FLASH 0
: GO TO 5
 370 IF INKEY$="n" THEN  GO TO 4
00
 390 GO TO 360
 400 LET a$="GOODBYE FAREWELL SE
E YOU TA RA  "
 402 CLS
 403 FOR f=0 TO 21
 405 PRINT  PAPER 6; INK 1; FLAS
H 1; BRIGHT 1;a$
 410 NEXT f
2999 GO TO 9999
3000 PRINT AT y-1,x-1; PAPER 6;
INK 2; FLASH 1;"C"; INVERSE 1;"C
"; INVERSE 0;"C";AT y,x-1;"C"; I
NVERSE 1;"CC";AT y+1,x-1;"C"; IN
VERSE 0;"CC"
3005 IF r<=y+1 AND r>=y-1 AND c<
=x+1 AND c>=x-1 THEN  FOR f=0 TO
 60: BEEP .002,f: NEXT f: LET sc
=sc+50: GO TO 3040
3020 FOR f=30 TO -30 STEP -1: BE
EP .002,f: NEXT f
3030 PRINT AT 21,13; INK 0; BRIG
HT 1; PAPER 4;"MISSED": GO SUB 5
000: LET y=17: LET x=p: RETURN
3040 PRINT AT 21,12; INK 0; BRIG
HT 1; PAPER 4;"DIRECT HIT"
3050 GO SUB 5000: GO TO 13
5000 FOR f=1 TO 50: NEXT f: PRIN
T AT 21,12; PAPER 4; BRIGHT 1;"
          "
5005 PRINT AT y-1,x-1; PAPER 5;"
   ";AT y,x-1;"   ";AT y+1,x-1;"
   "
5010 RETURN
7000 BORDER 7: INK 1: PAPER 7: B
RIGHT 1: CLS : PRINT AT 0,10;"MI
NESTORM"; OVER 1;AT 0,10;"______
___"
7010 PRINT '"  Your main base is
 your prime  concern, you must d
efend it     against enemy missi
les B by     launching your own
weapons A      These missiles ca
n be         detonated at any ti
me,they also have retro-jets and
 can hover.  They are also guide
d.             The enemy missile
s will also  leave mines behind
M,to detonateyour missiles early
 so allowing them to reach their
 target."
7020 PRINT '"       the keys are"
7030 PRINT '"6-steer left","7-ri
ght"'"9-retro boost/hover","0-ex
plode missile"
7040 PRINT '"          PRESS ANY K
EY TO START"
7050 PAUSE 0
7060 RETURN
9000 FOR f=1 TO 10
9010 READ a$
9015 FOR t=0 TO 7: READ a
9020 POKE USR a$+t,a
9030 NEXT t: NEXT f
9040 DATA "a",24,24,24,60,90,153
,165,195
9050 DATA "b",1,2,125,253,125,2,
1,0
9051 DATA "c",4,32,20,67,168,2,4
8,10
9052 DATA "d",1,3,7,15,31,63,127
,255
9053 DATA "e",128,192,224,240,24
8,252,254,255
9054 DATA "f",186,68,56,56,56,56
,56,16
9056 DATA "g",0,24,36,36,66,66,1
29,129
9057 DATA "h",24,126,126,231,231
,126,126,24
9058 DATA "i",231,165,66,231,219
,189,126,255
9059 DATA "m",165,66,165,24,24,1
65,66,165
9070 RETURN
```

No monsters no rubbish

AFTER I HAD bought the July edition of **Sinclair Programs** I tried the infinite lives POKE for **Jet Set Willy,** which works well. I have since found some POKEs which remove the monsters.

```
10 CLEAR 25000: LOAD "" CODE
20 FOR a=43780 TO 45823: POKE a,0: NEXT a
30 FOR a=46080 TO 49151: POKE a,0: NEXT a
40 POKE 35899,0
50 BORDER 1
60 RANDOMIZE USR 33792
RUN.
```

Do not LOAD the first part of the program.

I also own Wheelie, on which I have reached the eighth level. The codes for the earlier levels are: second WITTY, third SHARK, fourth BEBOP, fifth XENON, sixth ZX83B, seventh 2MQL3 and eighth HRME2.

N J Aves, aged 12,
Fleet, Hampshire.

ZX penfriend

I AM writing to you from the north of Italy. I have recently read some of the latest editions of *Sinclair Programs* and I must congratulate you on the good software which you publish.

I am also writing for another reason. I should like owners of 16K and 48K Spectrums to correspond with me so that we can exchange programs, news and information about the Spectrum. Here in Italy new software arrives very late, and there is not the variety which there is in the United Kingdom.

I would particularly like to hear from English user groups, as I believe they have lots of programs and information.

Help me to become a good Spectrum owner, and gain yourself an Italian friend by writing to me at the address below.

Maurizio Verdi,
Via Scanini 90/31,
20153 Milan,
Italy.

Competition

I AM writing to tell you how much I enjoy your magazine and all the programs in it. I think that most readers will agree, however, that one fault in it is that there is no competition. This would be a bonus, and would be worth every penny that I pay for the magazine — even though it is worth every penny as it is.

David Oliver,
Selkirk, Scotland.

ZX plea

WHEN WILL somebody produce something to help ZX-81 owners to solve their loading problems? What we want is to be able to load first time every time, and not have to sit there like ZX twits for five minutes, only to find that the program has crashed and our blood pressure is up again. Come on somebody, help us, we need it.

John Giles,
Ilford, Essex.

Pen friend

MY PARENTS recently bought me a 48K Spectrum which I am using successfully. I should like to know whether anyone between the ages of 14 and 16 would like to become my penfriend. We could exchange programs and I would be able to learn more about my computer. If anyone is interested, please write to me at the address below.

Karen Webster,
15 Melchet Road,
Harefield,
Southampton.

Ant raid

I HAVE beaten Stephen Tunstall's high score on the program Ant Raid. I managed to kill 82 ants. I think the game is great.

Thank you for a brilliant magazine.

Michael Pearce,
Honiton, Devon.

Forty niner

RECENTLY I bought a game called **Forty Niner.** After playing around ten games I got the hang of it and scored 51,935, which has given me aching fingers.

Can anybody give me details on high resolution graphics, as I was amazed by the picture of the cosmic cockerel, and by the writing?

N. Knight,
Sheffield.

Protection

I AM writing in connection with the **Password** program listed in the March edition of *Sinclair Programs.* I discovered that it is not an ideal program for protecting programs against pirates. You cannot change the code as you can in my program, and it is also longer than my program. A short, simple protection program is:

```
1 PRINT AT 9,7; "PLEASE ENTER PERSONAL CODE": INPUT g$
2 IF g$="PC246" THEN GOTO ? :CLS
3 IF g$ <> "PC246" THEN GOTO 1
```

You can change the code as many times as you like by changing the characters within the inverted commas on lines two and three. In line two the question mark should be replaced by the number of the first line of the main body of the program.

Richard Whitehurst,
Lichfield, Staffs.

Match met

WITH REFERENCE to Jason Goodwin's letter, "Meet your Match", in the July 1984 edition of *Sinclair Programs.* It is possible to beat the computer. I — a non-expert with computers — can beat it nine times out of ten. My son, Andrew, and I tried it after reading Jason's letter and I won again.

Ann Johnson,
Hockley, Essex.

High score

I HAVE JUST been reading the July issue of *Sinclair Programs* and have noticed that Duncan Cayless had achieved a score of 109 on **Alphabet Timer.** I have beaten his first record by 41 units, as I scored 68. I can normally achieve a score of less than 110. Please let me know if anyone has beaten this score.

Paul Brown,
Brighton, Sussex.

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

To: Sinclair Programs, 67 Clerkenwell Road, London EC1R 5BH

I enclose ..... Program(s) for the.....computer.

I guarantee that each program submitted is my own original work.

Signed .....

Name.....

Address.....

.....

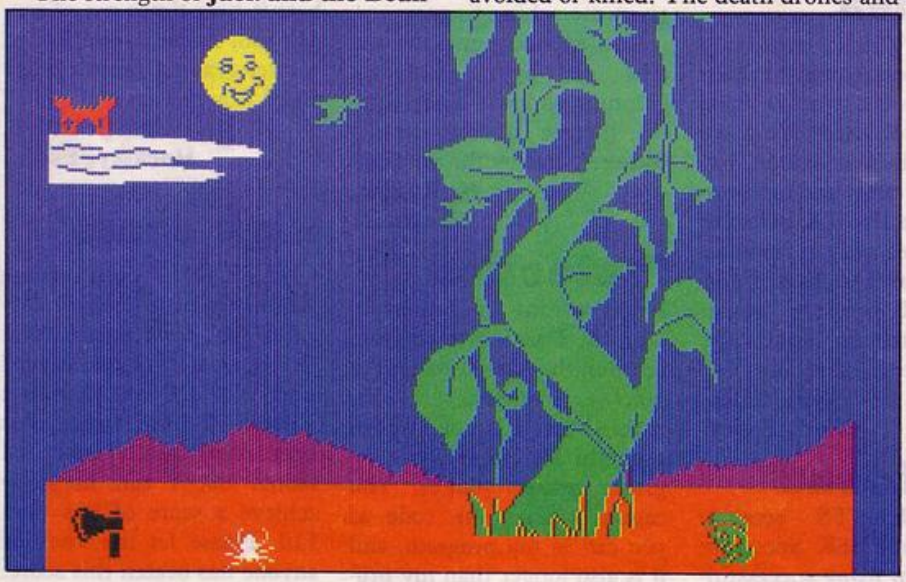
Youth's high-rise crime

We look at the latest Spectrum releases to discover just what Jack was doing up that beanstalk.

WE ALL know the story of Jack, the boy whose magic beans grow into a beanstalk up which he climbs to steal the giant's treasure at the top. Thor have turned this story into a very impressive computer game.

Playing the part of Jack you must climb the beanstalk, move around the giant's house, and take the treasure. There are, of course, problems. Strange creatures bounce around the screen, killing you if they touch you, and it is all too easy to fall to your death either by tumbling off an object or leaping carelessly off the screen.

The strength of **Jack and the Beanstalk** lies in its graphics. Each screen consists of a well-designed and detailed picture which remains static while a small amount of creatures move across this background. This is an excellent technique, and one of which we will doubtless see a lot more during the months to come.



Having overcome surprise at the graphics Jack and the Beanstalk proves to be a very enjoyable game. The instructions do not make it clear that one object must be collected from each screen before that screen can be left, and it is not immediately apparent why Jack should take the axe *before* climbing the beanstalk. Routes are also not obvious, but must be deduced by trial and error, which is frustrating and unnecessary. Most annoying of all is the long pause after a life is lost while the same little tune is played again, and again.

It is disappointing that a game on which such attention has obviously been lavished should fall down on minor details. Nonetheless, Jack and the Beanstalk has an originality which is rare in the software market at the moment.

Jack and the Beanstalk costs £5.95 and is produced by Thor Ltd, Erskine Industrial Estate, Liverpool, Merseyside.

The Prize

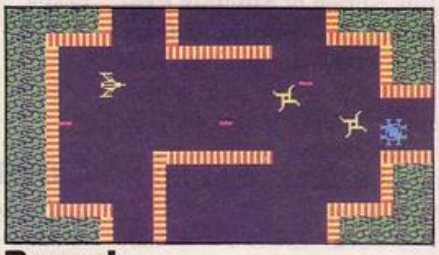
THE PRIZE is a phenomenally complicated maze game. The player's first task is to collect five code pods in numerical order. There are forty nine locations in this section of the maze, and each is populated by deadly monsters which must be avoided or killed. The death drones and mutants shoot at you, while the crushers block your way, squashing you to pieces.

There are only two points in your favour. Firstly, it is possible to find extra lives hidden in the maze. Secondly, somewhere in the maze is an energy base which provides immunity from enemies for a limited period of time.

Once you have mapped this level, avoided the drones, mutants and crushers, and collected the pods in order you find yourself transported to the next section of the maze, where you must repeat the process.

Prize money will be awarded to the first person to send a copy of the code screen on level four to Arcade.

The Prize is produced by Arcade Software Technology House, 32 Chislehurst Road, Orpington, Kent and costs £5.50.



Borzak

BORZAK from Betelgeuse reporting. Am now making my way back to my spaceship over rough terrain and marsh. Leap the crater, and the next, switch on the anti-gravity device, float along . . . there, end of level one.

"Starting level two now. Aaaargh, a giant frog. Speed up, leap, and over. Now another one, speed up, leap and . . . it moved, unfair. Back to the beginning, defeated by the frogs again.

"Sneaky level selection allows me to skip to level three. Over the hurdle, over the crater, anti-gravity over the next three hurdles. Splat, into the next crater.

"Switch to level four. A dragonfly! Duck, then leap the snake. Under, over, under, over. Phew. Now, over the stepping stones, over the leaping fish and under the spiders. Only level five to complete now."

Guiding Borzak through all five levels, back to his ship will be a challenge for all but the most experienced arcade enthusiasts. The keys are simple to use, but knowing when and where to jump, duck or speed up is a skill which needs weeks to perfect.

Borzak is produced for the Spectrum by Channel 8 Software, 51 Fishergate, Preston, Lancashire and costs £6.95.

Tornado low level

JUST WHEN you thought it was possible to use your computer to do something other than fly around and bomb things **Tornado Low Level** screamed up to the top of the charts, and we are all back where we started.

Not quite back, of course. The graphics of the game are extremely good. Your plane flies over trees, houses, pylons and sea at different heights. Your height is apparent due to the

distance your plane is from your shadow. This is a very good way of depicting three-dimensional scenes on screen, and has also been used by Psion in **Match Point.**

The game is also very difficult, for swooping low over your target at exactly the right point is not as easy as it appears at first sight. Hitting all targets before you run out of time or fuel is virtually impossible without hours of practice.

There is a tendency these days for manufacturers to rely heavily upon excellent graphics, which will make a game attractive in the shops, and to skimp upon other aspects of the game. Tornado has a very eye-catching screen display, but its plot shows little originality.

Tornado Low Level is produced for the 48K Spectrum by Vortex Software, 280 Brooklands Road, Manchester and costs £5.95.

Automania

THE SCREEN shows lots of levels, connected by ladders with obstacles to trip over, and holes to fall through. You control a character who moves around the screen, collecting objects to assemble on the other screen. No, wait; this time the character you move is an endearing cartoon of a garage mechanic. No, of course you haven't seen it before. You have to assemble a car, you see, and the program plays a Laurel and Hardy theme and . . . why are you looking so bored?

For those of you who have not seen variants on this game a thousand times before **Automania** is produced by Mikrogen, 44 The Broadway, Bracknell, Berkshire and costs £6.95.

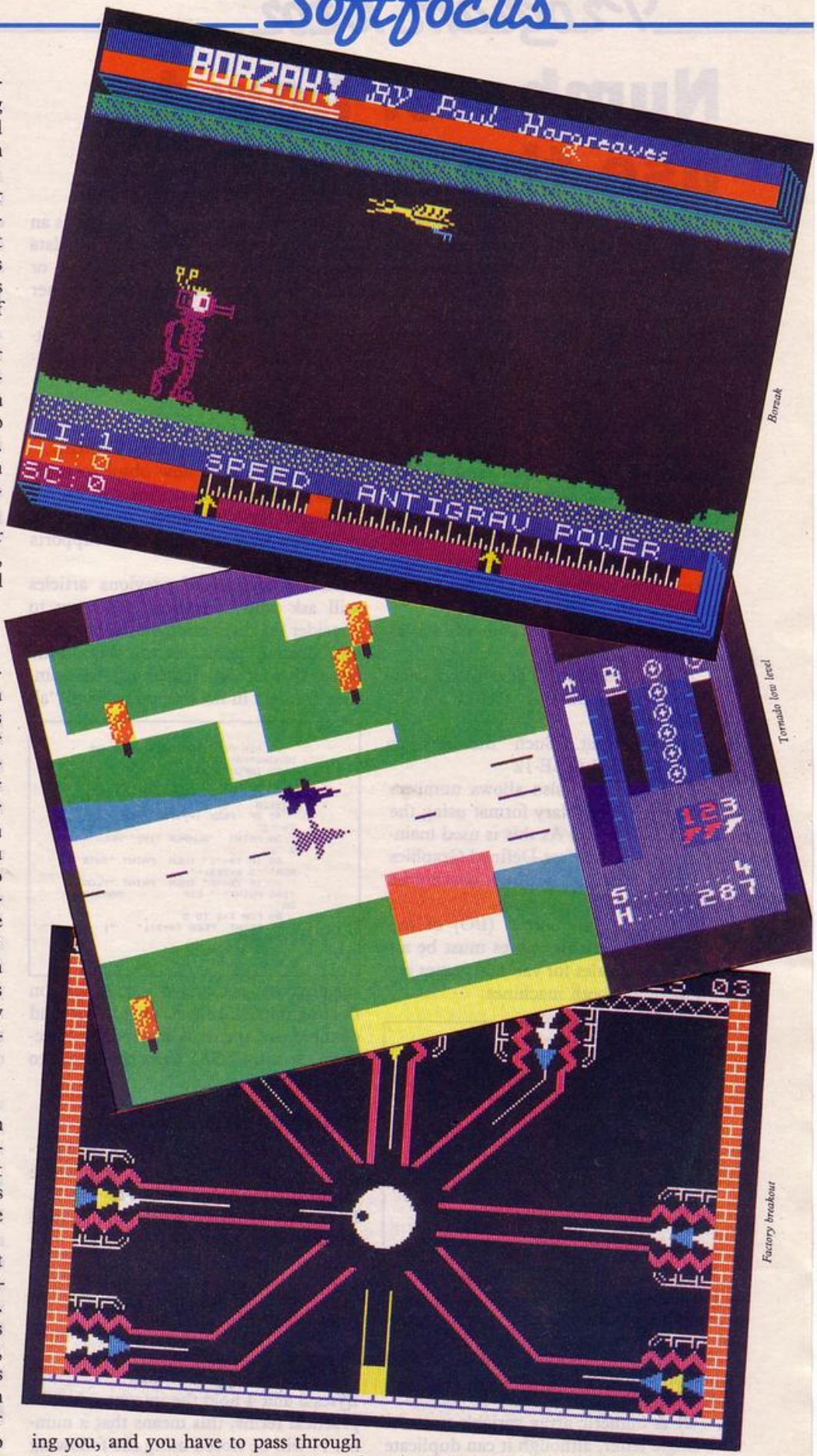
Factory breakout

THE ROBOT factory has been taken by aliens which have activated the factory's self-destruct mechanism. The only robot left is Zirky, and you must help him to evade the monsters and escape.

The plot is thin, but this does not stop **Factory Breakout** being an enjoyable, if rather straightforward game. There are three playscreens. Each has an elaborate description but, basically, the idea of the first is to shoot the lines which grow around you. If you can prevent the lines from reaching you for a set period you move on to screen two which involves crossing the screen without hitting any one of three barriers.

On the first level it is screen three which proves a problem. Your movement is restricted, there are aliens chasing you, and you have to pass through all the doors on the screen a number of times in order to finally obliterate them.

The three screens become rather repetitive after a while, and the game does not have any features which make it outstanding among arcade-type games. Factory Breakout is produced for the 48K Spectrum by Poppysoft, The Close, Common Road, Headley, Newbury, Berkshire and costs £5.50.



Borzak

Tornado low level

Factory breakout

Numbers: how to use them in Basic

TO BE ABLE to program your machine effectively and efficiently, it is important to know a little about numbers and number-crunching.

There are two aspects of numbers to consider:

1) How you see them.

2) How the computer sees them.

How you see numbers depends on the format you use for entering numeric data using INPUT, LET and READ commands. The same kind of format is used by the computer to present you with results using PRINT and LPRINT commands. There are only three types which are of immediate interest.

1) Integers. Whole numbers such as −1, 0 and 25

2) Real Numbers. Those with a decimal fraction such as 10.625, -1.33, 3.142 and ½

3) E Format. Such numbers as 0.32E10 and -1.683E-12

The Spectrum also allows numbers to be input in BINary format using the POKE command. As this is used mainly for setting up User Defined Graphics the BINary format need not concern us here.

For input and output (I/O) of numeric data, variable names must be assigned. The rules for variable names are the same for both machines:

```
  300 REM FLOATING POINT CONVERSI
ON
  310 INPUT X
  315 LET N=0
  320 LET S= SGN X
  330 LET X= ABS X
  340 IF X >= 2↑32 THEN  GO TO 40
0
  350 LET X=2*X
  360 LET N=N+1
  370 IF X<2↑31 THEN  GO TO 350

  380 GO TO 500
  400 LET X=X/2
  410 LET N=N-1
  420 IF X >= 2↑32 THEN  GO TO 40
0
  500 LET A= INT (X/256↑3)
  502 PRINT 2↑32; PRINT X
  504 LET X=X-256↑3*A  ↑
  508 LET B= INT (X/256↑2)
  510 LET X=X-256↑2*B
  520 LET C= INT (X/256)
  530 LET D=X-256*C
  540 PRINT "EXPONENT=";160-N
  550 PRINT "MANTISSA=";A-128*(S=
1)+" ";B;" ";C;" ";D
  560 GO TO 300
```

1) Simple numeric variables (containing one data item) can be any combination of letters and numbers, provided that the first is a letter.

2) A numeric array variable must be a single letter, although it can duplicate a letter which has been used for a simple variable.

Number representation

The Z80 microprocessor at the heart of both the Spectrum and ZX81 uses an 8 bit/byte pattern. Therefore all data representations, be they numbers or characters, are held in bytes, either singly or in combination.

There are three ways in which computers normally represent and handle numbers:

1) Integer

2) Floating Point

3) BCD (Binary Coded Decimal)

BCD arithmetic is now obsolescent as far as most micro Basics are concerned, although the assembler programmer will know that the Z80 still supports this representation.

Astute readers of previous articles will ask why it is even necessary to consider the distinction between integer and floating point, as the May issue stated that for both machines, "all numbers are held in floating point" and "all calculations performed are done on floating point". In fact, only the second of these statements is true of the Spectrum. So only ZX81 users can afford to skip the next section.

```
   10 REM FLOATING POINT/INTEGER
DEMONSTRATION
   20 INPUT N
   30 LET T$="F"
   40 LET V= PEEK 23627+256* PEEK
23628
   45 IF  PEEK (V+1)=0 THEN  LET
T$="I"
   50 PRINT '"NUMBER ";N;'"HELD A
S ";
   60 IF T$="I" THEN  PRINT "INTE
GER"'"5 BYTES:-"
   70 IF T$="F" THEN  PRINT "FLOA
TING POINT"'" EXP          MANTIS
SA"
   80 FOR X=1 TO 5
   90 PRINT  PEEK (V+X);"   ";
  100 NEXT X
  110 GO TO 20
```

Integer Data

An integer is interpreted by the Spectrum BASIC interpreter as any whole number in the range -65535 to +65535. Five bytes of memory are used to hold an integer, as follows:

Byte 1 = 0 (unused)
Byte 2 = 0 for positive integer
= 255 negative integer
Byte 3 = low byte
Byte 4 = high byte
Byte 5 = 0 (unused)

Bytes 3 and 4 hold the integer value. In practical terms, this means that a number N will be stored using the following formulae:

For a positive integer:
Byte 3 = N - 256*INT (N/256)
Byte 4 = INT (N/256) (high order)

For a Negative Integer:
Byte 3 = 65536 - N - 256*
INT ((65536-N)/256)
Byte 4 = INT ((65536-N)/256 (high order)

Although two of the five bytes are unused in this representation, it does enable the user or the computer to change the contents to floating point at any stage.

Floating point data

Any integer outside the range specified for the Spectrum, or any real or E format number specified for either machine will be held in floating point.

The system breaks the number down into two parts, exponent and mantissa, with the decimal point "floated" to maximize significance. In decimal, the process is easily understood. For example:

$0.005679 = 0.5679*10^{-2}$
$= 0.5679*E-2$

Thus, we have:
mantissa = 0.5679
exponent = -2

Binary floating point numbers are not so easily understood, although the principle is the same. The process is best demonstrated with the aid of Program 1 (suitable for both machines). Again, five bytes are allocated to each floating point number. The program will calculate the exponent (byte one) and mantissa (byte two) given the number x. In effect, we are putting a "binary decimal point" immediately to the left of the first significant binary digit as in decimal. In binary, with four bytes to fill for maximum accuracy, we "expand' or "contract" the mantissa, simultaneously "taking up the slack" on the exponent, by repeatedly multiplying or dividing by two.

As this is quite a difficult program to understand, I will use the reverse technique I recommended in my last article, i.e. program in words.

Setup (lines 300-340)

Input X (real number)
n=0 (number of multiplications/divisions by 2)
s=Sign of x
x=absolute value of x
If x>=2↑32 (overflow on 32 bits)
THEN jump to DIVIDE
Continue with MULTIPLY

Multiply (lines 350-370)

x = 2*x
n = n+1
} Double number and increment
If X<2↑31 (first bit of four bytes not yet set)
THEN jump to MULTIPLY
Jump to BYTE

Divide (lines 400-430)

x = x/2 } Divide number by 2
n = n-1 } and decrement n
IF X>=2↑32 (overflow on 32 bits) THEN jump to DIVIDE

Byte (lines 500-530)

A = INT (x/256↑3)	Byte 1
x = x-A*256↑3	Remainder
B = INT (x/256↑2)	Byte 2
x = x-B*256↑2	Remainder
C = INT (x/256)	Byte 3
D = x-256*C	Byte 4

Continue with EXPONENT

Exponent (line 540)

Print EXPONENT = 160 - n

Mantissa (line 550)

Print MANTISSA = A - 128 (if s = +ve i.e. x = positive), B,C,D
Jump to SETUP for next x

You are probably still puzzled by the adjustments to the exponent and mantissa. Clearly, the process of expanding or contracting the mantissa will render the first bit of our four byte group set (=1). Remembering that we are only simulating what the interpreter is doing when it reads a real number, the machine therefore knows that this is a set bit, so it is convenient to use it as a sign bit. Therefore, it is left set for negative numbers and reset (=0) for positive numbers.

In our simulation, resetting the first bit is equivalent to subtracting 128 (or 2↑7) from A. Thus, A will be less than 128 for positive numbers and greater than or equal to 128 for negative numbers. For quite different reasons the exponent is adjusted in order to balance accuracy equally between very large and very small numbers. As the exponent is an integer, as also is the mantissa now, which can range from D-255, this balance is best achieved by making the exponent of the absolute value of 0.5 (enter as ½ when running the program) equal to 128.

Thus,
IF ABS (x) > 1/2 THEN exp > 128 and
IF ABS (x) < 1/2 THEN exp < 128
You will find that the convention gives:

x=1/2:	Exponent	= 128
	Mantissa	= 0 0 0 0
x=-1/2:	Exponent	= 128
	Mantissa	= 128 0 0 0

To set the first bit of a four byte group from x=1/2 requires n to be incremented to 32. Hence the reason why n is subtracted from 160 to give an exponent of 128 at the "balance point". This "bias" becomes part of the convention (like the sign bit) and can now be used throughout.

Peek variables area

Program 2 is intended mainly for Spectrum users to demonstrate the fact that integers and real numbers are held differently. The line numbers are such that Program 2 can be run in conjunction with Program 1 to validate floating point representations, so ZX-81 users will also find it helpful in this respect.

The program shows how a number is actually stored in the VARS (variables) area of RAM. It gives the five byte representation of any number N, however it is entered and (for Spectrum) flags integer or floating point by looking at the first byte (zero for integers). To be sure that N is the first variable in VARS, you should RUN (rather than GOTO 10) to execute, in order to clear the variables area.

A few modifications are necessary to run Program 2 on the ZX-81:

1) Line 40: Change the systems variable pointing to VARS to 16400 and 16401.

2) For 1K machines change PRINT to LPRINT in line 90. This is to prevent screen printing from expanding the display file, thereby shifting VARS further down in memory.

To illustrate how the two machines differ in application, inputting N = 1200 gives:
Spectrum:
5 byte integer: 0,0,176,4,0
ZX-81:
5 byte floating point:
139 (exponent)
22,0,0,0 (mantissa)
Spectrum owners can also obtain the floating point representation by entering, for example,
N = 1200.00000001

Number manipulation

So far, we have only considered how numbers are represented inside the computer. Numbers also have to be arithmetically manipulated using all the various operators at the programmer's disposal.

Without going into detail, it will be clear that integer arithmetic is much more straightforward than floating point. Quite apart from the problem of conversion; adding, subtracting, and multiplying numbers with different exponents presents even bigger problems for the designer of micro hardware/systems software. The solution is much more difficult for an 8 bit micro than 32 bit main-frames, minis and the QL.

Although the speed advantage of integer arithmetic is to be found in some micros this feature is sadly lacking for both Spectrum and ZX-81.

You should by now have a good idea of how numbers are stored in the VARS area of RAM. You also need to know that the memory area allocated to your BASIC program also stores any numbers which are assigned literally within the program. Such numbers are called LITERALS. These may come in many forms e.g. LET a=5, DATA 201, 193;

```
 10 REM  PEEK INTO PROGRAM
 20 LET Z=10
 30 GO TO 40
 40 DATA 3,5
 50 PRINT "LOC"; TAB 10;"CODE"

 55 LET V= PEEK 23635+256* PEEK
23636
 60 FOR X=V TO V+100
 70 PRINT X; TAB 10; PEEK X
 80 NEXT X
```

IF X>3; FOR Z = 1 TO 10; LET r=r+1 etc. All the numbers in these statements are literals.

Every time a literal is read by the BASIC interpreter, it is immediately converted to the floating point or integer (Spectrum) representation. More precisely, this is done as soon as a statement containing literals is entered. The format used is the same 5 byte pattern we have already seen for storing numbers in the variables area.

Peek program area

Program 3 will help you to understand more about literals by PEEKING the memory assigned to it. It can be used for both machines, although ZX-81 users should type line 55 as:

55 LET V = PEEK 16509 +
256 * PEEK 16510

This reflects the different start points used for storing BASIC programs.

The program looks at the first 100 bytes of the PROGram area. Lines 20, 30 and 40 do little except demonstrate literals. Such lines are called "dummies". The demonstration works as follows:

1) RUN program, and scroll output up to CODE = 13. This denotes ENTER and marks the end of the first REM line. (CODE=118=NEWLINE for ZX-81).

2) The next four locations contain line number and length for line 20.

3) Five bytes are then seen to represent the five keystrokes of LET Z = 10

4) You will now see CODE=14 (1 for ZX-81) which is the number flag.

5) The next five bytes contain the number 10 in integer format (floating point for ZX-81).

6) If you scroll on, you can work out for yourself how the pattern repeated for other literals (three more).

Far beyond Mirkwood lies a magical, uncharted land

We look at some recent adventure releases and find within them vast, complex worlds which, a year ago, would have been impossible.

EXCELLENT though many of last year's other adventure programs were, it was **The Hobbit** which convinced most people that it was possible to fit an entire new world inside a Spectrum. Anybody who was anybody had to find out how to escape from the goblin's dungeon, and the game sold and sold.

The lure of an alternative world has proved lastingly attractive. The real attraction of fitting such a place into a computer is that, unlike a book or a film, it is possible for the user to become involved, and to change the course of events.

Lords of Midnight from Beyond is the best development so far of the other worlds theme. It includes 4000 locations, and the view in each of eight directions from all these locations can be displayed on screen. Forests, ruins, lakes and mountains can all be seen from each different angle. The effect is similar to that of **The Forest** by Phipps Associates, although it is here used in a completely different context.

Luxor and Doomdark

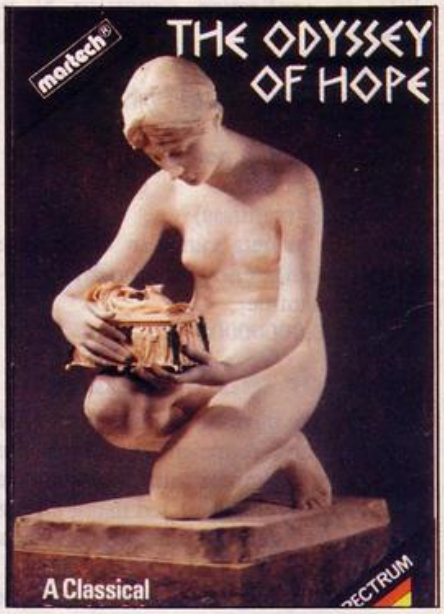
The story behind the game is so complex that it cannot be explained in the usual form of cassette insert but, instead, takes up several chapters of fantasy novel, which are included with the program.

The story is, in brief, that Lord Doomdark has taken over the Kingdom of the Moon, and infected its inhabitants with the Ice Fear. His forces, the Foul, are the villains. Against him fight the rightful heir to the kingdom, Luxor the Moonprince and his son Morkin, together with Corleth the Fey and Rorthron the Wise. Luxor possesses the moonring, which allows him to see through the eyes of any major character on his side, a neat structural device which explains convincingly why you should be able to move from one character to the next.

The aim of the game is two-fold. Firstly, you can concentrate on the character of Morkin. His quest is to find and destroy the Ice Crown, source of Doomdark's power. This is by no means an easy task, for Morkin must steal through Doomdark's armies, find food and shelter on the way, kill wild beasts and finally make his way to Doomdark's fortress and steal the Ice Crown. His problems then continue for he must then find one of the few characters able to destroy the Ice Crown.

To complete the entire game it is necessary not only to move Morkin, but also the other three characters. Their aim is to hold off the forces of Doomdark, and finally to drive them out of the country. The Foul move down from the north, so sympathisers must be recruited, armies mustered and troops taken to battle as quickly as possible.

The game is enormously complicated and reading the book, understanding the point of the game and learning to relate the position of characters on screen to the map can take one entire



playing session. People who like to load a game and start playing immediately will find this off-putting but, once the game has been understood, it is relatively easy to play, although coming anywhere near to finishing it is extremely difficult.

What the game really lacks is a detailed map, of the sort available with The Forest. Mapping 4000 locations by hand is extremely difficult, and a professional battle map would make all the difference in keeping close track of what is happening in battle.

After the Lords of Midnight, the other adventure games on the market, good though they are, pale in comparison.

The Odyssey of Hope is set in classical Greece. The theme of the adventure is that Hope has been stolen from Pandora's Box. Those who remember classical myths and legends will find that they have a headstart on clues on this program. How can you escape from the labyrinth, what is a naiad, and what are the great clashing rocks at sea? All these questions will stump players who have neglected their Homer.

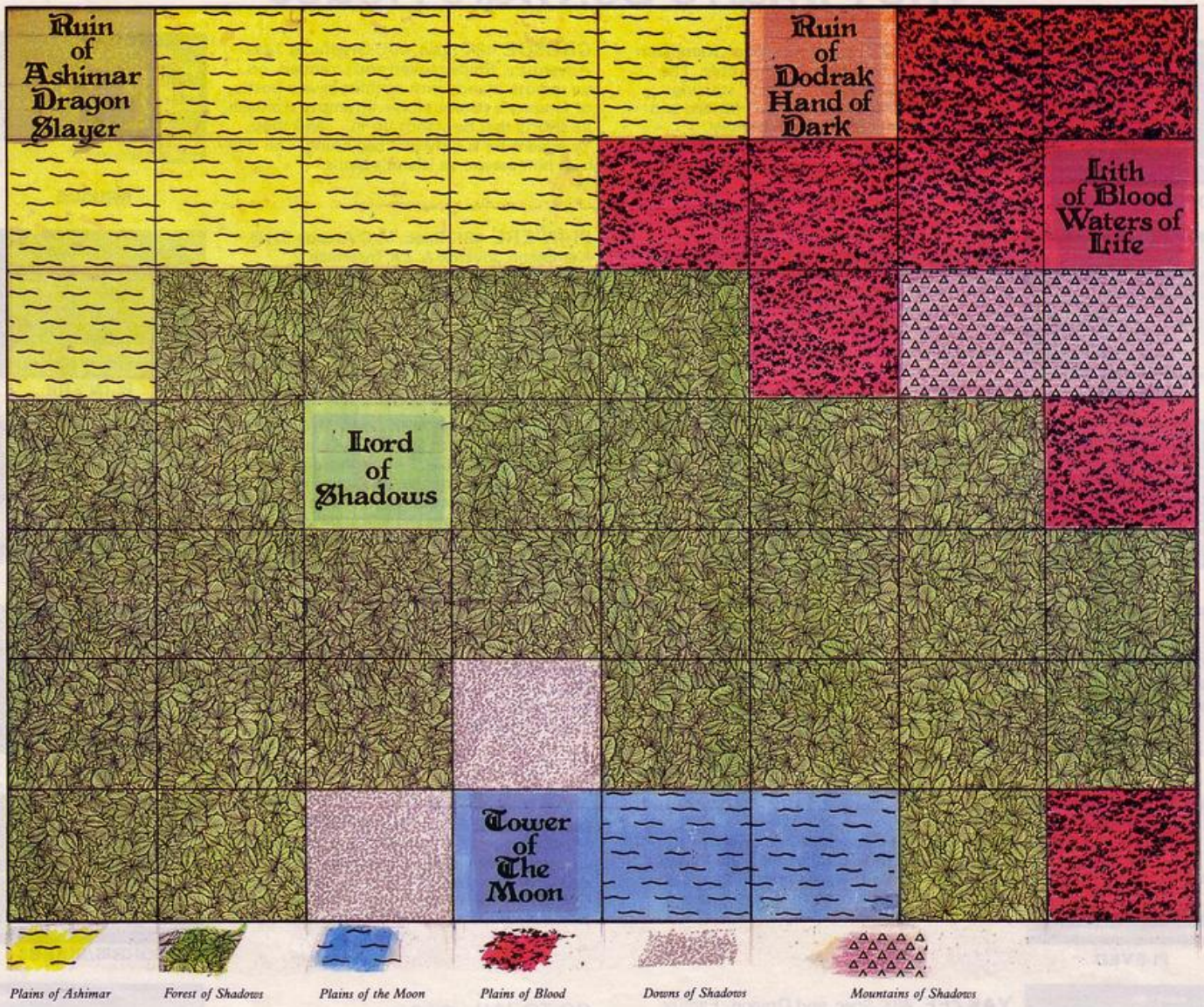
Eat the fish

The adventure itself is very difficult. Many directions lead to instant death at sea, and it takes many false starts and careful mapping before you can be sure enough of your ground to begin solving any problems.

Problem number one is that, right next to the start location, you walk into a building from which escape seems impossible. A careful search reveals fish, wine, plough, loom and wheel, none of which seem designed for escape. The window pictured does not appear to exist in the computer's memory, and few ardent adventurers are likely to be able to fathom that it is necessary to eat the fish, and then use its backbone as a saw.

Obscure stuff. Even more esoteric is the new adventure, **Crusoe** from Automata. Both **Pimania** and **Uncle Groucho** from Automata were enjoyable games, and so is Crusoe. If other adventure games can be described as being like a normal crossword, Automata's adventures can be described as acrostics. Completely obscure at first, they have their own cult following.

Crusoe is an illustrated adventure, showing a segment of island, complete with trees, seas, monsters, mysterious objects and much more. The Pi-man, star of so many other adventures, is set to save Crusoe: a very difficult task. It is easy to become so engrossed in watching the miniscule Pi-man, move around the eye-strainingly detailed map, that you forget this is an adventure, and that the Pi-man must do many things other than simply move.



There are 4,000 different locations in the Lords of Midnight. This section of the terrain north of the Tower of the Moon shows how complex the countryside is.

It is essential that the Pi-man maintains his energy, by eating and drinking regularly. Drinking at pools is easy enough, but obtaining food from the fruit trees is more difficult. If the Pi-man does not eat he feels ill very soon, and will not last a day. His physical condition is charted on the right of the screen, in mock Middle-English script. Other dangers involve being eaten by crocodiles, sea-monsters or common-or-garden land monsters.

You either like Automata games or you hate them. Either way, they are so off-beat that they are worth trying once. Crusoe is difficult, it will take a lot of thought and, with those graphics, it will certainly strain your eyes.

Temple of Vran, from Incentive Software is the second adventure in their Mountains of Ket trilogy. The story carries on from the first part, **Mountains of Ket,** although it is not necessary to have played the first adventure in order to enjoy the second.

Use the trampoline

Your mission in Temple of Vran is to reach the temple in the east and, once there, to put an end to its evil inhabitants. On the way you will find some strange objects to help you in your quest. A sleeping kitten, a mouse, an elephant and a small trampoline all make up part of the mystery. Also useful are objects which you already hold when the game begins. Check these before you move anywhere, or you may meet an unexpected and needless death.

A feature of these games is their fight sequences, in which your prowess, energy and luck are displayed on screen, together with those of your opponent. In many cases, it is obvious from the outset which character will win and, each time you are hit, you are given the chance to escape. The Warts, who appear frequently in this game and are given to throwing acid or attacking you for no reason, give plenty of opportunity for testing fighting skill. It is necessary to be careful, though, before indulging in needless slaughter for many of the characters who can be killed are useful.

Intriguing game

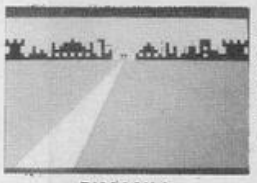
Temple of Vran is an intriguing game with a lot of possibilities. The puzzles are simple to begin with, and then become more and more difficult. Knowing when to fight people, and when to talk to them is also a continual problem, and the lack of a HELP facility makes the problems appear even more difficult.

AUTOMATA U.K.

The Piman's Software House

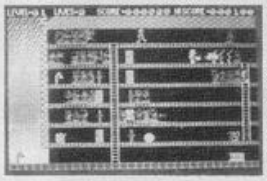
DEUS EX MACHINA

DEUS EX MACHINA 48K Spec. Kempston Joystick & ZX Interface 2 compatible. The unique new era of entertainment, starring Ian Dury, Jon Pertwee, Frankie Howerd and you, in an animated televised fantasy, synchronised to an incredible stereo soundtrack. There is nothing like it in this world.



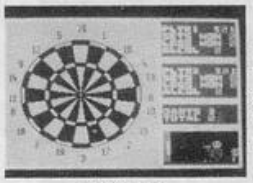
PIMANIA

PIMANIA 48K Spec. The Cult Adventure that's for real! Could you be the lucky winner of 'The Golden Sundial of Pi'? Many have tried and failed. Voted program of 1983 by the Computer Trade Association (Joint winner).



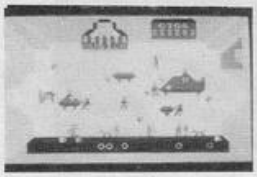
PIROMANIA

PIROMANIA 48K Spec. M/C Arcade Style, Kempston Joystick & ZX Interface 2 compatible. Strike a light! Fire your imagination. That bright spark of a Piman is flaming well out to make the residents of Automata Towers the toast of the town! Can you help Walter Hose dampen the Piman's extinguished career and help the inmates give up smoking?



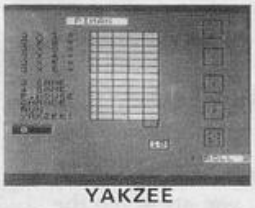
DARTZ

DARTZ 48K Spec. Family fun. This 'arrowing version of your local's favourite game! Includes true life scoring with 'The more you play the more you drink, the worse your game becomes' rule!



PI-EYED

PI-EYED 48K Spec. M/C Arcade Style. Kempston Joystick compatible. The Piman's hit the bottle! Can you help him negotiate the traffic and drink the town dry?



YAKZEE

YAKZEE 48K Spec. and Dragon. Family fun. An oriental game of luck and skill for 1 to 4 players, playing between 1 to 4 rounds. Each tape comes with both the Dragon and the 48K Spectrum versions along with a simple to follow guide on how to play YAKZEE.

NEW WHEELS JOHN? 48K Spec. Family fun. Would you buy a used motor from this man? Dare you clock an old banger? Have you ever wondered what it's like to run your own second-hand car lot? Wheel leave the rust to you!

CRUSOE 48K Spec. M/C Graphic & Text Adventure. Shipwrecked and stranded, on ye remote island, with nothing save a bottle of Granny's patent elixyr, an empty stomach, ye shorts that he stands up in . . and thou. Ye adventure is only just beginning. Can you help him escape ye island's perils?

CRUSOE

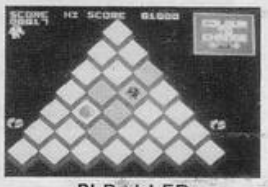
PI-IN'ERE 48K Spec. M/C Arcade Style. Kempston Joystck & ZX Interface 2 compatible. 61 screens of action as Burt searches for the elusive bug inside a computer, while keeping out of the reaches of the minor menaces. The program includes Hi-Score, Save and Load facility as well as Replay from last position feature.

PI-IN'ERE

OLYMPIMANIA 48K Spec. M/C Arcade Style. Currah Micro Speech & Kempston Joystick compatible. For all those who just can't get enough of the Olympics, the Piman stages his own just for you! Yes he's going for gold in the craziest events you've ever seen! Can you set new world records in the Speepichase, Alpi Ski-ing, Pitathlon, Pi-Jump, or even the Butterpi? The Piland International Anthem on the flip side.

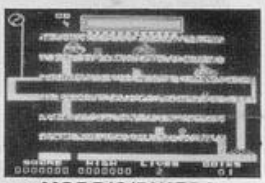
OLYMPIMANIA

PI-BALLED 48K Spec. M/C Arcade Style. Currah Microspeech & Kempston Joystick compatible. Bouncy, bouncy, this fast action game will let you have a ball! Starring The Balls Brothers, Sid the Snake, Jas'n'Col, and your friend and ours The Piman.



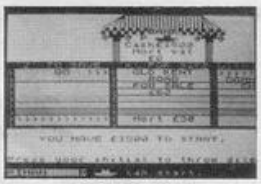
PI-BALLED

MORRIS MEETS THE BIKERS
16/48K Spec. M/C Arcade Style. Kempston Joystick compatible. Morris finds himself abandoned in a multi-storey car park. Help him gather the 10 coins per screen to pay his way out, while avoiding the kamikaze bikers.



MORRIS/BIKERS

GO TO JAIL 48K Spec.
Family fun. A computer property trading game for up to 5 players. Your computer not only acts as a banker, but can also take on the roll of a ruthless player, buying, selling and trading its own property.



GO TO JAIL

BACKCHAT CBM64 Speech Synthesiser. Automata's speech synthesiser comes complete with easy to use Programming Manual and Software cassette containing both BASIC & M/Code programs, so you can now add speech to all your home grown games using BACKCHAT's allophone vocabulary.

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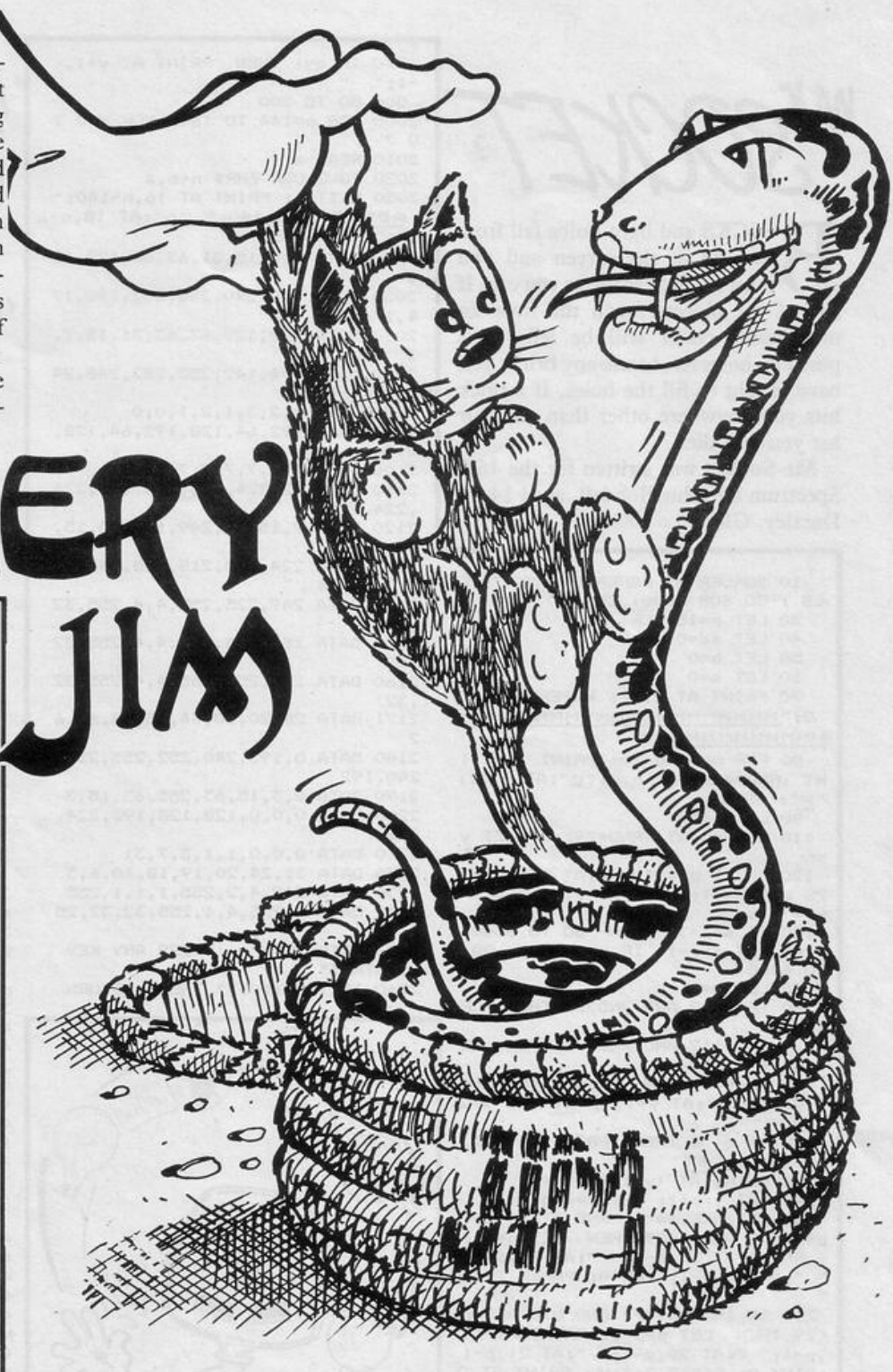
SLITHERY Jim is a program suitable for young children. Tempt Jim out of the basket by offering him different animals to eat. There are thirty animals recognised by Jim and these include cats, dogs, bears and sloths. If any of these are mispelt or an unknown animal is entered, a question mark is shown. The other answers depend on how Jim is feeling. If he is happy he will want the animal but if you upset him he may want to eat you.

Slithery Jim was written for the 16K ZX-81 by Ron Wood of Christchurch, Gloucestershire.



SLITHERY JIM

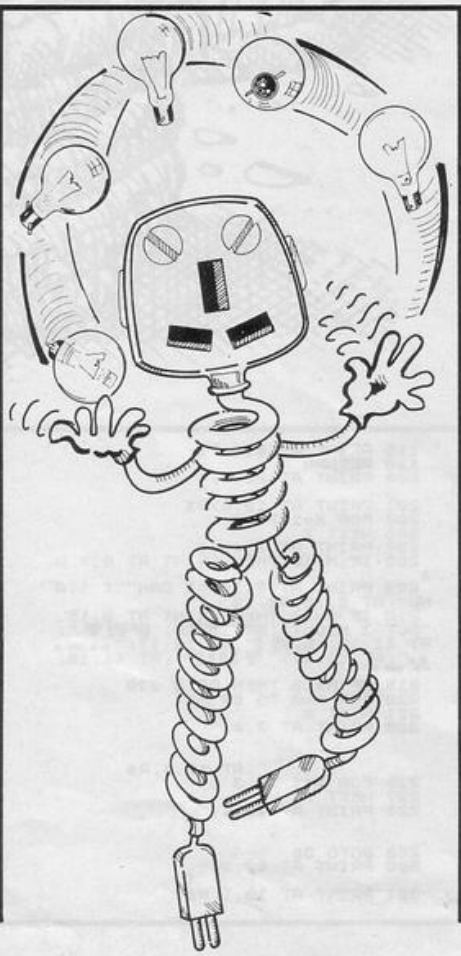
```
    1 REM "JIM"
    2 DIM A$(6,25)
    3 LET A$(1)="CATMOLEMOUSEMONK
EYGIRAFFE"
    4 LET A$(2)="RATVOLEHORSEDONK
EYWALLABY"
    5 LET A$(3)="PIGFROGSLOTHLIZA
RDCHICKEN"
    6 LET A$(4)="DOGTOADCAMELWEAS
ELGORILLA"
    7 LET A$(5)="BATLIONZEBRARABB
ITBUFFALO"
    8 LET A$(6)="COWBEARTIGERSPID
ERPENGUIN"
   10 LET M=0
   11 LET T$="JIM" SLITHERY
   12 PRINT AT 0,3;T$
   14 PRINT AT 12,3;"
 SLITHERY JIM THE                PYT
HON IS SULKING IN                HIS
 BASKET. HE MIGHT                 CO
ME OUT IF YOU CAN
 TEMPT HIM WITH A               LITT
LE SNACK. HE EATS               ALL
 SORTS OF ANIMAL.                TY
PE IN WHAT A          PECKISH PYTH
ON MIGHT FANCY..."
   15 GOSUB 100
   16 LET B$="
   17 LET M$="
   18 LET R$="
   20 LET S$="
   21 LET W$="
   22 LET V=INT (RND*6)+1
   23 LET W=INT (RND*5)+1
   32 FOR X=12 TO 18 STEP 2
   33 PRINT AT X,3;B$
   34 NEXT X
   35 FOR X=1 TO 20
   36 PRINT AT 20,3;"          ";AT
20,3;"HEY JIM"
   37 NEXT X
   40 PRINT AT 20,10;",WOULD YOU
LIKE A...."
   41 INPUT Q$
   42 LET M=M+1
   43 IF M=10 THEN GOTO 200
   45 IF W=1 THEN LET P$=A$(V)(1
TO 3)
   46 IF W=2 THEN LET P$=A$(V)(4
TO 7)
   47 IF W=3 THEN LET P$=A$(V)(8
TO 12)
   48 IF W=4 THEN LET P$=A$(V)(13
TO 18)
   49 IF W=5 THEN LET P$=A$(V)(19
TO 25)
   54 IF Q$=P$ THEN GOTO 300
   56 FOR T=1 TO 6
   57 IF Q$<>P$ AND Q$=A$(T)(1 TO
 3) OR Q$=A$(T)(4 TO 7) OR Q$=A$
(T)(8 TO 12) OR Q$=A$(T)(13 TO 1
8) OR Q$=A$(T)(19 TO 25) THEN GO
TO 200
   58 NEXT T
   59 FOR T=1 TO 6
   60 IF Q$<>A$(T)(1 TO 3) OR Q$<
>A$(T)(4 TO 7) OR Q$<>A$(T)(8 TO
 12) OR Q$<>A$(T)(13 TO 18) OR Q
$<>A$(T)(19 TO 25) THEN GOTO 400
   61 NEXT T
   64 PRINT AT 10,5;R$
   65 FOR X=0 TO 5
   66 NEXT X
   70 PRINT AT 7,5;S$
  100 PRINT AT 21,3;"BUT FIRST,PR
ESS A KEY..."
  105 IF INKEY$="" THEN GOTO 105
  110 CLS
  115 PRINT AT 0,3;T$
  120 RETURN
  200 PRINT AT 20,0;"
                    "
  201 PRINT AT 10,4;R$
  205 FOR X=1 TO 3
  206 NEXT X
  207 PRINT AT 7,4;S$
  208 IF M=10 THEN PRINT AT 6,4;W
$
  209 PRINT AT 7,15;"I CAN""T STA
ND";AT 8,15;Q$;"S"
  210 IF M=10 THEN PRINT AT 9,15;
"BUT I MIGHT";AT 10,18;"
";AT 11,18;"
";AT 12,17;"
";AT 13,17;"
";AT 14,18;"
"
  215 IF M=10 THEN GOTO 339
  220 FOR X=0 TO 80
  221 NEXT X
  225 PRINT AT 7,4;"
                    ";AT 10,4;R$
  226 FOR X=1 TO 3
  227 NEXT X
  228 PRINT AT 10,4;"
                    "
  250 GOTO 35
  300 PRINT AT 20,0;"
                    "
  301 PRINT AT 10,1;R$
  305 FOR X=1 TO 3
  306 NEXT X
  310 PRINT AT 7,1;S$
  315 FOR P=1 TO 7
  320 PRINT AT 7,P;S$
  321 NEXT P
  325 FOR P=7 TO 1 STEP -1
  326 PRINT AT 7,P;S$
  327 NEXT P
  328 PRINT AT 6,4;W$
  330 PRINT AT 7,15;"A ";Q$;"?"
  331 PRINT AT 8,15;"I""D LOVE A
";Q$
  332 PRINT AT 9,15;"LET ME GIVE
YOU A"
  333 PRINT AT 10,15;"
";AT 11,15;"
"
  339 FOR X=1 TO 20
  340 PRINT AT 7,3;"
";AT 7,3;"
";AT 7,3;"
"
  341 NEXT X
  345 STOP
  400 PRINT AT 20,0;"
                    "
  405 PRINT AT 7,5;M$
  407 PRINT AT 7,15;"I DON""T KNO
W";AT 8,15;"WHAT THAT IS"
  410 FOR X=0 TO 80
  411 NEXT X
  415 PRINT AT 7,4;"
                    "
  420 GOTO 35
```

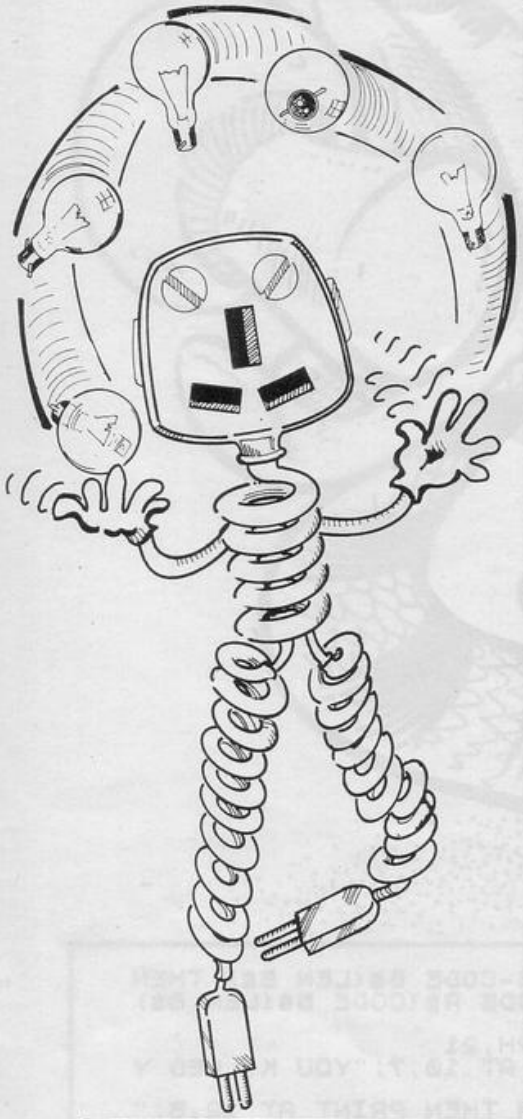
Mr SOCKET

BRICKS and light bulbs fall from the top of the screen and you must catch as many as you can. If any of the objects touch the floor an uncrossable crater will be left. It is possible, however, to use any bricks you have caught to fill the holes. If a brick hits you anywhere other than on your hat you will die.

Mr Socket was written for the 16K Spectrum by John Hobdell, aged 14, of Dursley, Glos.

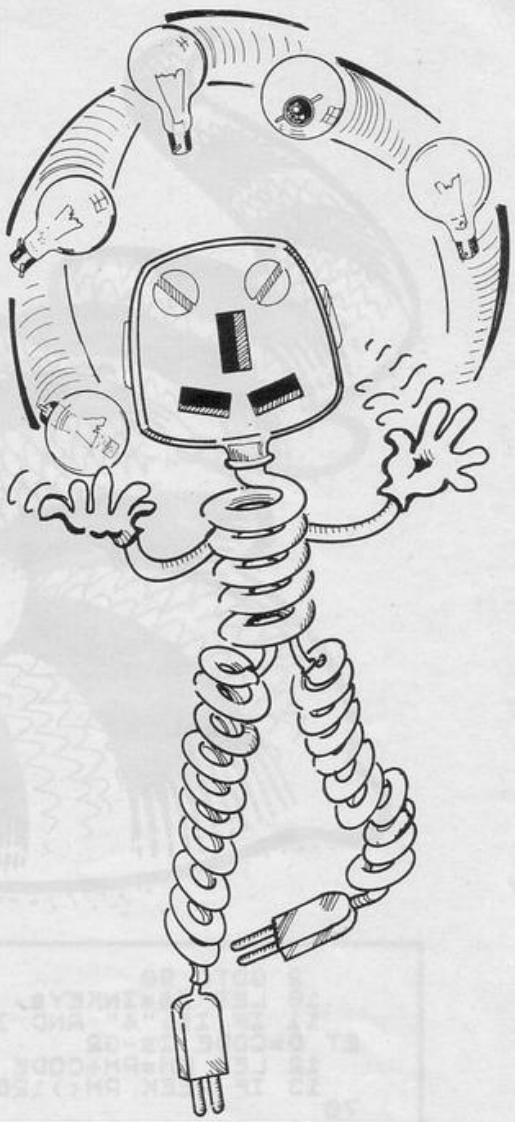
```
  10 BORDER 2: PAPER 0: INK 7: C
LS : GO SUB 3000: CLS
  30 LET p=15: LET h=1
  40 LET sc=0
  50 LET b=0
  60 LET s=0
  70 PRINT AT 21,0; PAPER 2; INK
 0;"MMMMMMMMMMMMMMMMMMMMMMMM
MMMMMMMM MMMM"
  80 FOR n=0 TO 20: PRINT  INK I
NT (RND*4+1);AT n,0;"O";AT n,31;
"P": NEXT n
  90 LET z=50
 110 LET x=INT (RND*29)+1: LET y
=h
 120 PRINT #1; INK 0;AT 0,0;"DRO
PS LEFT = ";z;" ";AT 0,16;" SCOR
E = ";sc
 130 IF s+b=30 THEN  GO TO 6500
 140 LET z=z-1: IF z=0 THEN  GO
TO 6000
 150 LET q=0
 160 IF x<12 AND RND>.5 THEN  LE
T q=1
 170 IF x>19 AND RND>.5 THEN  LE
T q=-1
 210 IF q=0 THEN  PRINT  INK 3;A
T y,x;"AB";AT y+1,x;"CD";AT y+2,
x;"EF"
 220 IF q<>0 THEN  PRINT AT y+2,
x; INK 2;"ST"
 230 PRINT AT (y>1)*y-1,x;"  "
 240 LET y=y+1: LET x=x+q
 250 IF INKEY$="p" AND ATTR (21,
p+2)<>2 AND p<29 THEN  LET p=p+1
: PRINT AT 19,p-1;" ";AT 20,p-1;
" ";AT 21,p-1; INK 0; PAPER 2;"M
"
 260 IF INKEY$="P" AND b>0 AND p
<29 THEN  LET p=p+1: PRINT AT 19
,p-1;" ";AT 20,p-1;" ";AT 21,p-1
; INK 0; PAPER 2;"M": PRINT AT 0
,31-b;" ": LET b=b-1
 270 IF INKEY$="o" AND ATTR (21,
p-1)<>2 AND p>1 THEN  LET p=p-1:
 PRINT AT 19,p+2;" ";AT 20,p+2;"
 ";AT 21,p+2; INK 0; PAPER 2;"M"
 280 IF INKEY$="O" AND b>0 AND p
>1 THEN  LET p=p-1: PRINT AT 19,
p+2;" ";AT 20,p+2;" ";AT 21,p+2;
 INK 0; PAPER 2;"M": PRINT AT 0,
31-b;" ": LET b=b-1
 290 PRINT AT 21,p; PAPER 2; INK
 0;"KL";AT 20,p; INK 4; PAPER 0;
 BRIGHT 1;"IJ";AT 19,p; INK 1;"G
H"
 320 IF q=0 AND y=17 AND p=x THE
N  GO TO 4000
 330 IF q<>0 AND y=17 AND p=x TH
EN  GO TO 4050
 340 IF q<>0 AND y>17 AND y<20 A
ND p=x THEN  GO TO 6250
 350 IF y=19 THEN  GO TO 4250
 360 IF q=-1 THEN  PRINT AT y+1,
x+1;"  "
 370 IF q=1 THEN  PRINT AT y+1,x
-1;"  "
 500 GO TO 200
2005 FOR n=144 TO 164: FOR m=0 T
O 7
2010 READ a
2020 POKE USR CHR$ n+m,a
2030 NEXT m: PRINT AT 16,n-140;"
 AB";AT 17,n-140;" CD";AT 18,n-1
40;" EF": NEXT n
2040 DATA 0,0,15,31,63,60,123,12
0
2050 DATA 0,0,240,248,252,140,17
4,174
2060 DATA 122,120,63,63,31,15,7,
3
2070 DATA 174,142,252,252,248,24
0,224,192
2080 DATA 1,2,3,1,2,1,0,0
2090 DATA 192,64,128,192,64,128,
0,0
2100 DATA 4,7,7,7,7,7,7,63
2110 DATA 32,224,224,224,224,224
,224,252
2120 DATA 7,15,29,249,159,30,15,
7
2130 DATA 224,240,219,158,248,12
0,240,224
2140 DATA 249,225,255,4,4,255,32
,32
2150 DATA 159,135,255,4,4,255,32
,32
2160 DATA 255,255,255,4,4,255,32
,32
2171 DATA 28,20,20,34,65,65,65,6
2
2180 DATA 0,192,240,252,255,252,
240,192
2190 DATA 0,3,15,63,255,63,15,3
2200 DATA 0,0,0,128,128,192,224,
248
2210 DATA 0,0,0,1,1,3,7,31
2220 DATA 31,24,20,19,18,10,6,3
2230 DATA 248,4,2,255,1,1,1,255
2240 DATA 0,255,4,4,255,32,32,25
5
2250 PRINT #1;"   PRESS ANY KEY
TO START"
2260 IF INKEY$<>"" THEN  RETURN
2270 GO TO 2260
3005 PRINT  PAPER 6; INK 0;AT 1,
11;"MR. SOCKET";AT 2,9;"    meet
s     ";AT 3,5;"THE 60 WATT LIGH
T BULBS"
3010 PRINT AT 7,7;"Use 'O' to go
 left"
3020 PRINT AT 9,9;"& 'P' to go r
ight"
3030 PRINT AT 11,5;"Pressing CAP
S SHIFT & a         direction key
 will allow         you to rebuil
d some wall"
3040 GO TO 2000
4010 PRINT AT y-1,x;"  "
4020 PRINT  INK 7; BRIGHT 1;AT y
,x;"AB";AT y+1,x;"CD"
4030 LET s=s+1
4035 LET sc=sc+60
4040 PRINT AT 0,s; INK 7; PAPER
1;"N"
4042 FOR n=7 TO 0 STEP -1: PRINT
  BRIGHT 1; INK n;AT y,x;"AB";AT
 y+1,x;"CD": BEEP .01,15-n: NEXT
 n
4045 GO TO 100
4050 PRINT AT y+1,x-q;"  "
4060 PRINT AT y,x;"  "
4070 BEEP .1,20: BEEP .2,40
4080 PRINT AT 0,30-b; PAPER 2; I
NK 6;"U"
4090 LET b=b+1
4095 LET sc=sc+100
4100 GO TO 100
4250 IF q<>0 THEN  GO TO 4300
4255 PRINT AT y-1,x;"  ";AT y,x;
"  ";AT y+1,x;"  "
4260 FOR n=0 TO 7: PRINT  PAPER
7-n; INK n;AT y,x;"AB";AT y+1,x;
"CD";AT y+2,x;"EF"
4270 BEEP n/200,-n*5: NEXT n
4280 PRINT AT y,x;"  ";AT y+1,x;
"  ";AT y+2,x; PAPER 0; INK 2;"Q
R"
4290 GO TO 100
4300 PRINT AT 20,x-q;"  ";AT 21,
x; INK 2; PAPER 0;"QR"
4305 FOR n=-20 TO -30 STEP -2: B
EEP .01,n: NEXT n
4310 GO TO 100
6005 FOR n=5 TO 30 STEP 5: BEEP
n/100,-n: NEXT n
6010 PRINT AT 7,9; FLASH 1;"MISS
ION OVER"
6020 PRINT AT 9,1;"OF THE 50 lig
ht bulbs dropped"
```





Continued on page xx

```
6030 PRINT AT 11,5;"you safely c
aught "; FLASH 1;s
6040 PRINT AT 13,5;"You have als
o in your"
6050 PRINT AT 15,6;"possession "
; FLASH 1;b; FLASH 0;" bricks"
6060 PRINT AT 17,6; PAPER 4; INK
 0;"YOUR SCORE IS ";sc
6100 PRINT #1; FLASH 1;"    PRES
S ANY KEY TO START      "
6110 IF INKEY$<>"" THEN  CLS : G
O TO 20
6120 GO TO 6110
6250 PRINT  INK 4; PAPER 8;AT 21
,p-2;"UUUU";AT 20,p-1;"(sp:ig5:
sp)";AT 19,p-1;"(g3:ig4:g2)";AT 1
8,p-1;"(sp:ig5:sp)"
6260 PRINT AT 7,13; FLASH 1;"R.I
.P"
6265 FOR n=5 TO 30 STEP 5: BEEP
n/100,-n: NEXT n
6270 PRINT AT 9,2;"You were brav
e and fearless      in your endea
vour to finish        your missi
on and your             bravery i
s rewarded               with a s
core of";AT 15,13; FLASH 1;sc
6400 PRINT #1; FLASH 1;"    PRES
S ANY KEY TO START      "
6410 IF INKEY$<>"" THEN  CLS : G
O TO 20
6420 GO TO 6410
6510 PRINT AT 7,6; FLASH 1;"MISS
ION ACCOMPLISHED"
6520 PRINT AT 9,0;"You safely ca
ught "; FLASH 1;s; FLASH 0;" lig
ht bulbs"
6530 PRINT AT 11,4;"You also sav
ed "; FLASH 1;b; FLASH 0;" brick
s"
6540 PRINT AT 13,6; PAPER 4; INK
 0;"YOUR SCORE IS ";sc
6550 PRINT AT 16,7; INK 5;"Press
 any key when          you a
re ready for            your
next mission": IF INKEY$<>"" THE
N  LET b=0: LET s=0: LET h=h+2:
CLS : GO TO 50
6555 BEEP .01,RND*10
6560 GO TO 6550
```

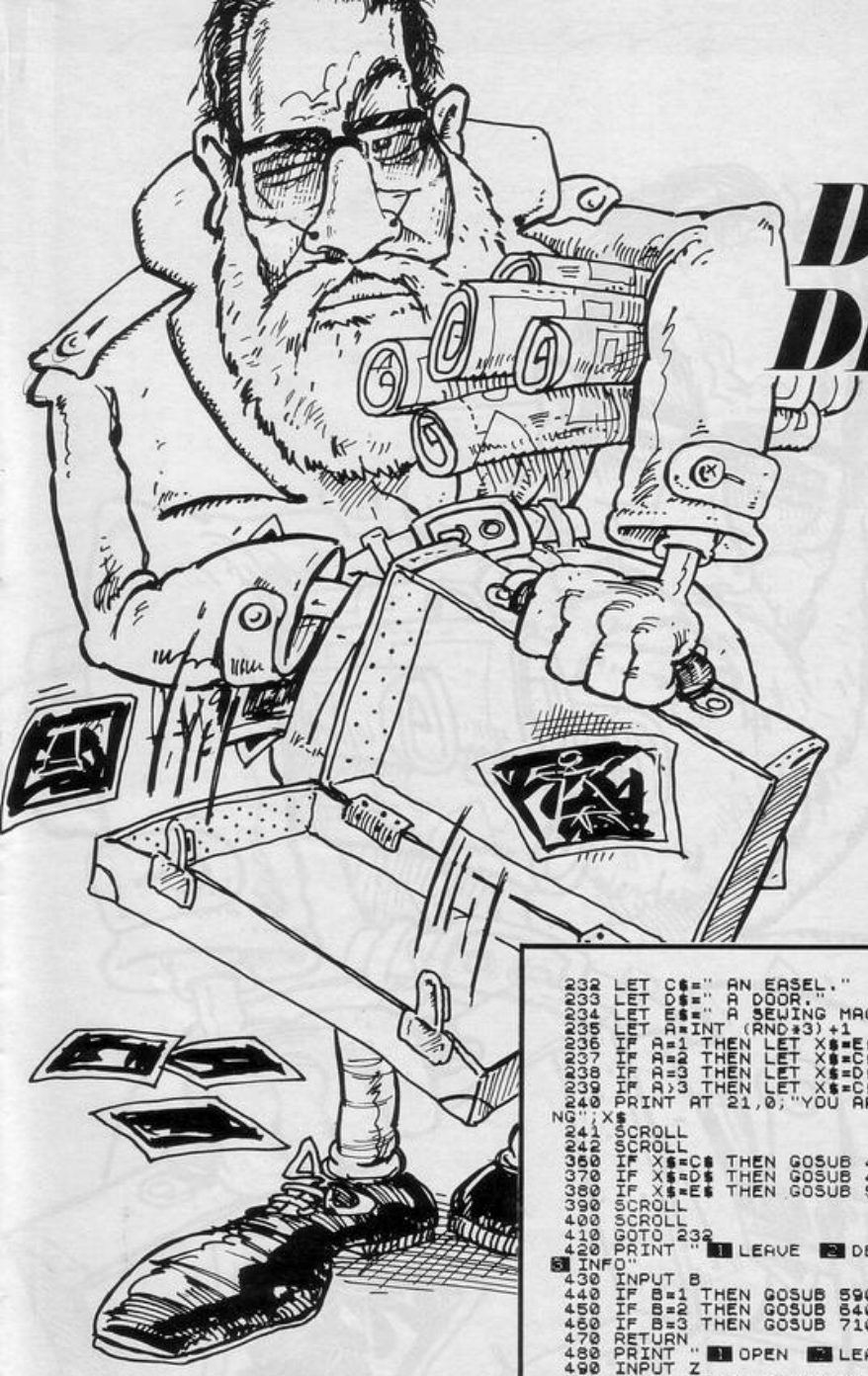


Ravenous Reptile

MUSHROOMS worth varying points appear at intervals on the screen. You, the reptile, must try to eat them before they turn poisonous. Each mushroom will turn poisonous if it is not eaten before its value reaches 0. If you manage to eat a mushroom your score will increase and extra sections will be added to your body according to the number of points left in the mushroom.

Ravenous Reptile was written for the 16K ZX-81 by Gerard Pegram of Braintree, Essex.

```
   2 GOTO 90
  10 LET I$=INKEY$
  11 IF I$>"4" AND I$<"9" THEN L
ET D=CODE I$-32
  12 LET PH=PH+CODE A$(D)-33
  13 IF PEEK PH<>128 THEN GOSUB
70
  14 LET B$=B$+CHR$ D
  15 POKE PH,156
  16 RETURN
  20 IF PH<>PT AND T=0 THEN POKE
 PT,128
  21 LET PT=PT+CODE A$(CODE B$)-
33
  22 LET B$=B$(2 TO )
  23 RETURN
  30 FOR X=1 TO 10
  31 GOSUB 10
  32 GOSUB 20
  33 NEXT X
  40 LET PO=P+68+INT (RND*30)+IN
T (RND*21)*33
  41 IF PEEK PO<>128 THEN GOTO 4
0
  42 LET O=INT (RND*9)+29
  43 POKE PO,O
  44 FOR X=1 TO 2*(O-28)
  45 GOSUB 10
  46 GOSUB 20
  47 NEXT X
  48 LET O=O-1
  49 IF O>28 THEN GOTO 43
  50 POKE PO,136
  51 GOTO 30
  60 FOR T=1 TO N-28
  61 GOSUB 10
  62 NEXT T
  63 GOSUB 20
  64 LET T=0
  65 GOTO 30
  70 IF PH=PT AND T=0 THEN RETUR
N
  71 IF T=0 AND D<>5-CODE B$(LEN
 B$) THEN POKE PT,128
  72 LET N=PEEK PH
  73 IF N>128 THEN GOTO 80
  74 POKE PH,23
  75 LET S=S+N-28
  76 PRINT AT 0,12-LEN STR$ S;S
  77 GOSUB 14
  78 GOTO 60
  80 IF D=5-CODE B$(LEN B$) THEN
 POKE PH+CODE A$(CODE B$(LEN B$)
)-33,128
  81 POKE PH,21
  82 PRINT AT 10,7;"YOU KILLED Y
OURSELF"
  83 IF S>H THEN PRINT AT 12,5;"
YOU BEAT THE HIGH-SCORE"
  84 IF S>H THEN LET H=S
  85 FOR X=1 TO 60
  86 NEXT X
  87 CLS
  88 GOTO 91
  90 LET H=0
  91 LET S=0
  92 LET P=PEEK 16396+256*PEEK 1
6397
  93 LET A$="4PI 6"
  94 LET B$="■■"
  95 LET D=4
  96 LET PH=P+381
  97 LET PT=P+379
  98 LET T=0
 100 PRINT TAB 7;"ROVENOUS REPTI
LE",,,,,"GUIDE THE SNAKE ROUND T
HE AREA",,,"USING THE CURSOR KEY
S.EAT FOOD",,,"(EG.""■"") TO SCO
RE POINTS AND",,,"GROW LONGER.AV
OID EATING POISON",,,"FOOD (EG."
"■"") AND YOUR TAIL.",,,,,,,"
 PRESS ANY KEY TO START"
 101 IF INKEY$="" THEN GOTO 101
 110 POKE 16418,0
 111 PRINT AT 0,0;"    SCORE 0000
      HIGH 0000    "
 112 PRINT "
                    "
 113 FOR X=1 TO 21
 114 PRINT "
                    "
 115 NEXT X
 116 PRINT "
                    "
 117 POKE PT,156
 118 POKE PT+1,156
 119 POKE PH,156
 120 PRINT AT 0,28-LEN STR$ H;H
 121 GOTO 30
 130 SAVE "REPTIL■"
 131 RUN
```



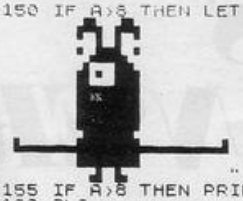
DRESS DESIGNER

HOLD off spies, cheat guards and design breathtaking clothes in **Dress Designer,** written for the 16K ZX-81 by Grant and Claire Ritchie of Dalkeith, Midlothian.

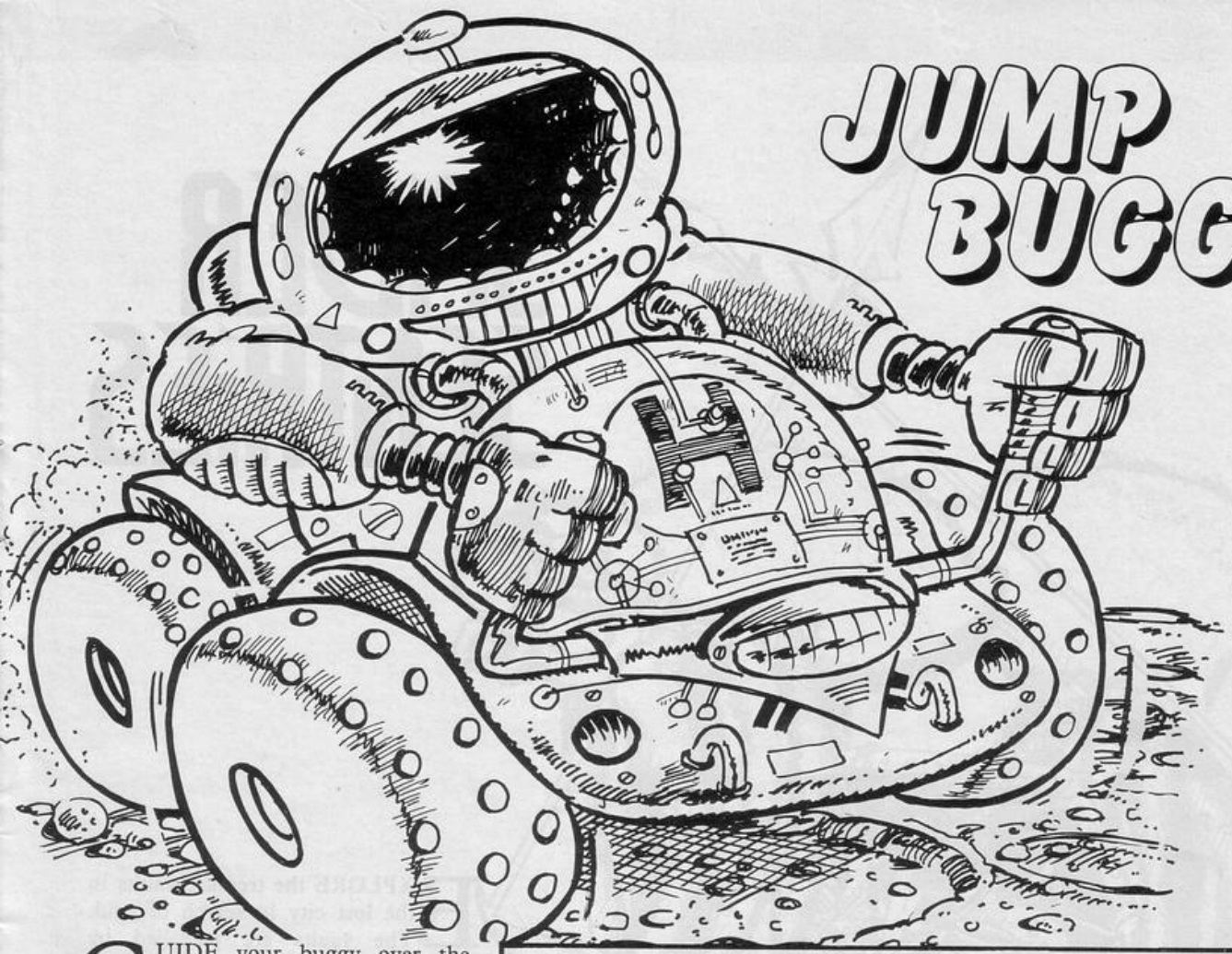
Your location is unknown so you must explore. You are able to swap fashions, enter a room, sew dresses if you find a sewing machine or steal designs if you discover an easel. If a guard leaves the room to admire himself you can sneak in and find a fashion. Your needle power, number of designs and fashions collected and also the number of spies killed are shown at the end of the game, together with your score.

```
   1 PRINT "
iS DRES
   "
   2 FOR N=1 TO 40
   3 PRINT "*DESIGN";
   4 NEXT N
   5 PRINT ,,"****PRESS**A**KEY*
***.........."
   7 IF INKEY$="" THEN GOTO 7
   8 CLS
   9 PRINT "WHAT IS YOUR NAME?"
  10 INPUT B$
  11 PRINT "HI ";B$;".WELL IT""S
 LIKE THIS..."
  12 PRINT ,,"YOU HAVE BEEN CHOS
EN ABOVE ALL    OTHERS FOR YOUR D
ESIGNING        ABILITY.YOU ARE A
LSO VERY TOUGH.SO YOU ONLY HAVE
THE HOUNOUR     ";B$;"."
  13 PRINT ,,"YOU WERE TRANSPORT
ED THROUGH      ETERNITY UNTIL YOU
 REACHED THE    YEAR 10,000 A.D.YO
UR JOB IS TO    ATTACK AND HOLD OF
F SPIES AND     DESIGN BREATHTAKIN
G CLOTHES.      BEWARE OF THE EVIL
 GHOUL...  GOOD LUCK ";B$;"."
  14 PRINT ,,"****PRESS**A**FOR*
*NEXT**PAGE***"
  15 IF INKEY$="" THEN GOTO 15
  16 CLS
  17 PRINT "OH I FORGOT...YOU DO
""NT KNOW WHERE YOU ARE.YOU""LL
JUST ""AVE TO GO EXPLORING ""COS
 I DONT EITHER.WOT A SHAME"
  18 PRINT ,,,,,,,"PRESS ANY KEY
TO START."
  20 LET M=0
  21 LET NP=200
  22 LET D=0
  23 LET F=0
  24 LET S=0
 230 PAUSE 3000
 231 CLS
 232 LET C$=" AN EASEL."
 233 LET D$=" A DOOR."
 234 LET E$=" A SEWING MACHINE."
 235 LET A=INT (RND*3)+1
 236 IF A=1 THEN LET X$=E$
 237 IF A=2 THEN LET X$=C$
 238 IF A=3 THEN LET X$=D$
 239 IF A>3 THEN LET X$=C$
 240 PRINT AT 21,0;"YOU ARE FACI
NG";X$
 241 SCROLL
 242 SCROLL
 350 IF X$=C$ THEN GOSUB 420
 370 IF X$=D$ THEN GOSUB 480
 380 IF X$=E$ THEN GOSUB 530
 390 SCROLL
 400 SCROLL
 410 GOTO 232
 420 PRINT " 1 LEAVE  2 DESGIN
3 INFO"
 430 INPUT B
 440 IF B=1 THEN GOSUB 590
 450 IF B=2 THEN GOSUB 640
 460 IF B=3 THEN GOSUB 710
 470 RETURN
 480 PRINT " 1 OPEN  2 LEAVE"
 490 INPUT Z
 500 IF Z=1 THEN GOSUB 870
 510 IF Z=2 THEN RETURN
 520 RETURN
 530 PRINT " 1 SEW  2 DISCONNECT
  3 LEAVE"
 540 INPUT D
 550 IF D=1 THEN GOSUB 910
 560 IF D=2 THEN GOSUB 980
 570 IF D=3 THEN RETURN
 580 SCROLL
 590 SCROLL
 610 PRINT " 1 NORTH 2 SOUTH 3 E
AST 4 WEST"
 620 INPUT X
 630 RETURN
 640 SCROLL
 650 SCROLL
 660 LET A=INT (RND*3)+1
 670 IF A>2 THEN GOSUB 1520
 680 IF A=1 THEN GOSUB 1070
 690 IF A=2 THEN GOSUB 1450
 700 RETURN
 710 CLS
 720 PRINT AT 3,10;"INFORMATION"
;AT 4,10;"-----------"
 730 PRINT
 740 PRINT
 750 PRINT TAB 4;"NEEDLE POWER=
";NP
 760 PRINT
 770 PRINT TAB 4;"DESIGNS=";D
 780 PRINT
 790 PRINT TAB 4;"FASHIONS=";F
 800 PRINT
 810 PRINT TAB 4;"SPY'S DEAD=";S
 820 PRINT AT 15,6;"SCORE=";((NP
*2)+D+(F*5)+(S*11))
 830 PRINT AT 21,0;"<<<<PRESS AN
Y KEY TO CONTINUE>>>"
 840 PAUSE 3000
 850 CLS
 860 RETURN
 870 LET X=INT (RND*4)+1
 880 IF X<3 THEN GOSUB 1550
 890 IF X>3 THEN GOSUB 1630
 900 RETURN
 910 LET X=INT (RND*2)+1
 920 SCROLL
 930 SCROLL
 940 IF X<3 THEN PRINT "O.K.YOU
SEWED A DRESS"
 950 IF X>2 THEN PRINT "THIS MAC
HINE IS DISCONNETED."
 960 IF RND>.7 THEN GOSUB 1050
 970 RETURN
 980 LET A=INT (RND*2)+1
 990 SCROLL
1000 SCROLL
1010 IF A<3 THEN PRINT "O.K.YOU
DISONNECTED IT"
1020 IF A>2 THEN PRINT "IT IS AL
READY DISCONNECTED"
1030 IF RND>.7 THEN GOSUB 1050
1050 SCROLL
1060 SCROLL
1070 LET A=INT (RND*9)+1
1080 IF A<3 THEN LET M$="
      EVIL
      BLOBUCLE "
1090 IF A=3 THEN LET M$="
                 "
1091 IF A=3 THEN PRINT "
     INVADER"
1100 IF A=4 THEN LET M$="
      SQARAL    "
1110 IF A=5 THEN LET M$="
      PHEONIX   "
1120 IF A=6 THEN LET M$="
      SPY       "
1130 IF A=7 THEN LET M$="
PURPLE EATER PEOPLE"
1145 IF A=8 THEN LET M$="
      PAC-MAN   "
```

```
1150 IF A>8 THEN LET M$="
```



```
"
1155 IF A>8 THEN PRINT "GHOUL"
1160 CLS
1170 PRINT AT 0,0;"YOUVE MET ";A
T 3,0;M$
1180 SCROLL
1185 SCROLL
1190 PRINT AT 21,0;" 1 ATTACK 2
RETREAT"
1200 INPUT B
1210 IF B=2 AND A<6 THEN RETURN
1220 IF B=1 THEN GOTO 1260
1230 SCROLL
1240 SCROLL
1250 PRINT "HE HATES CHICKENS."
1260 LET A=INT (RND*99)+1
1270 SCROLL
1280 SCROLL
1290 PRINT "HE HAS A POWER OF ";
A
1300 SCROLL
1310 SCROLL
1320 PRINT "INPUT POWER 1-9 "
1330 INPUT P
1340 LET PF=P*5
1350 LET NP=NP-(PF/2)
1355 IF NP<1 THEN GOTO 2110
1360 IF PF>A THEN GOTO 1390
1370 LET A=A-PF
1380 GOTO 1270
1390 SCROLL
1400 SCROLL
1410 PRINT AT 20,0;"YOU SURE MAS
HED HIM.STRENGTH IS NOW ";NP
1415 LET S=S+1
1420 RETURN
1430 SCROLL
1440 SCROLL
1450 LET A=INT (RND*500)+100
1460 PRINT AT 20,0;"YOUVE FOUND
";A;" DESIGNS ";B$
1470 LET D=D+A
1475 LET NP=NP-10
1480 IF D>2500 THEN GOTO 1860
1490 RETURN
1500 SCROLL
1510 SCROLL
1520 PRINT "YOUVE FOUND A FASHIO
N."
1530 LET F=F+1
1540 RETURN
1550 SCROLL
1560 SCROLL
1570 PRINT "DOOR GUARDED.GOT A F
ASHION ?"
1580 IF F<1 THEN RETURN
1590 SCROLL
1600 SCROLL
1610 PRINT " YES "
1620 LET F=F-1
1630 SCROLL
1640 SCROLL
1650 PRINT AT 20,0;"THE GUARD WE
NT TO ADMIRE HIMSELFSO RUN IN QU
ICK"
1660 LET A=INT (RND*4)+1
1670 IF A=2 THEN GOSUB 1430
1680 IF A=3 THEN GOSUB 1500
1690 IF A<2 THEN GOSUB 1050
1700 RETURN
1710 CLS
1720 PRINT AT 3,0;" ▮▮▮▮▮▮▮▮▮▮▮ T
HE END ▮▮▮▮▮▮▮▮▮▮▮ "
1730 PRINT AT 5,0;"YOU WERE KILL
ED BY THE DREADED GHOUL */;/**<
-+=() $""/*().,,*?;?."
1770 PRINT
1780 PRINT " YOU SCORED ";((NP*2
)+D+(F*5)+(S*11));" BEFORE YOU
KICKED THE BUCKET "
1795 PRINT
1800 PRINT "YOU FOUND ";D;" DESG
INS"
1810 PRINT
1820 PRINT TAB 10;" WELL DONE "
1830 GOTO 2030
1845 STOP
1910 PRINT AT 5,0;" YOUVE BEATEN
THE GHOUL AND HIS CRONIES !NOT
TO HARD TO DO! MAST. CHARAC
HTER THAT BLOBUCLE EH ! "
1950 PRINT ,,,,," YOU FOUND ";D;"
DESIGNS ",,,,"ALSO YOU HAVE ";F
;" FASHIONS LEFT ",,"AS WELL AS
KILLING ";S;" SPYS "
2040 IF H<((NP*2)+D+(F*5)+(S*11)
) THEN LET H=((S*2)+D+(F*5)+(S*1
1))
2050 PRINT " **HIGHEST SCORE=";H
2060 PRINT AT 21,0;" ANOTHER GO
Y/N "
2070 INPUT A$
2080 IF A$="N" THEN STOP
2090 CLS
2100 GOTO 20
2110 CLS
2120 PRINT ,,,,,," TOUGH BANANAS
YOU RUN OUT OF STRENGTH.(HA H
A HA HA HA)"
2180 PRINT ,,,," THE GHOUL AND H
IS CRONIES WON AGAIN."
2190 GOTO 2040
9998 SAVE "D▮"
9999 RUN
```



JUMP BUGGY

GUIDE your buggy over the planet's surface, jumping the potholes and rocks where necessary. Press any key to make the buggy jump. If you fall into a hole or crash into a rock the game ends and your score is displayed.

Jump Buggy was written for the 16K Spectrum by Russell Wooberry of Farnham, Surrey.

```
   1 REM       USR @ MERGE  LLI
ST ) OR  GO SUB VAL +w))STR$
LIST <>........
   2 LET a=5+PEEK 23635+256*PEEK
 23636
   3 FOR w=a TO a+24: READ b$
   5 LET x=CODE b$-48-(39*(b$>"É
")): LET y=CODE b$(2)-48-(39*(b$
(2)>"É"))
   6 POKE w,x*16+y: NEXT w
   7 DATA "06","c0","11","00","4
0","d5","e1","23","c5","01","1f"
,"00","1a","ed","b0","2b","77","
00","23","23","13","c1","10","f0
","c9"
  10 GO SUB 9080
  13 BRIGHT 0: PAPER 0: BORDER 0
: CLS : CLS : GO SUB 9300
  14 OVER 0: LET s=0:: DIM a$(2,
5): LET a$(1)="G G G": LET a$(2)
="I I I": CLS : GO SUB 9200
  15 INK 3: LET n=0: LET f=15: L
ET p=43
  16 LET h=1: LET d=3
  17 FOR i=18 TO 21: PRINT AT i,
0; INK 3;"(32*ig8)": NEXT i
  18 LET j=0
  19 LET x=17: LET y=3
  21 FOR i=1 TO 2: PRINT AT 0,11
;"          ";AT x,y;"      ";AT
x-1,y;"      ": IF SCREEN$ (x,y+5
)<>" " THEN  GO TO 2Q00
  29 PRINT AT 17,0;" ": LET l=US
R 23760: PRINT AT x,y; INK 6;A$(
I);AT x,y+1; INK 4;"F";AT x,y+3;
"F";AT x-1,y;"ABCDE";AT 0,11; IN
K 5;"SCORE=";s;AT 18,0; INK 3;"(
ig8)": LET s=s+1: IF j=1 THEN  G
O TO 51
  44 IF SCREEN$ (x+1,4)<>" " THE
N  GO TO 50
  45 IF SCREEN$ (x+1,5)<>" " THE
N  GO TO 50
  46 IF SCREEN$ (x+1,6)<>" " THE
N  GO TO 50
  47 GO TO 51
  50 PRINT AT x,y; INK 0;"      "
;AT x-1,y;"      ": LET x=x+1: PR
INT AT x,y; INK 6;a$(i);AT x,y+1
; INK 4;"F";AT x,y+3; INK 5;"F";
AT x-1,y; INK 5;"ABCDE": LET p=3
3: GO TO 2000
  52 BEEP .01,n-5: IF J=1 THEN
GO TO 54
  53 IF INKEY$<>"" AND x=17 THEN
  LET x=16: LET c=7: LET j=1: PR
INT AT x+1,y;"      ": LET n=10
  54 IF j=1 THEN  LET c=c-1: IF
c=0 THEN  LET j=0: LET x=17: LET
 n=0: PRINT AT x-2,y;"      "
  56 IF RND*15<1 AND H=1 THEN  P
RINT AT 17,28;"H"
  58 LET d=d-1: IF d=0 THEN  LET
 h=1
  59 IF h=0 THEN  GO TO 61
  60 IF RND*f>14.8 THEN  PRINT A
T 18,29; INK 3;"K J": LET d=6: L
ET h=0
  61 LET f=f+.005: NEXT i: GO TO
 21
3000 FOR i=1 TO 100: NEXT i: PRI
NT AT x,y; INK 0;"      ";AT x-1,
y; INK 0;"      "
3005 PRINT AT 0,11; INK 5;"SCORE
=";s: LET a=2: LET b=4
3006 FOR i=7 TO 3 STEP -1
3010 OVER 0: INK i: PLOT 43,p+a:
 DRAW b,-a: DRAW -b,-a: DRAW -b,
a: DRAW b,a
3012 FOR K=I*5 TO I*5-10 STEP -1
: BEEP .01,K: NEXT K: FOR j=1 TO
 20: NEXT j
3013 OVER 1: INK i: PLOT 43,p+a:
 DRAW b,-a: DRAW -b,-a: DRAW -b,
a: DRAW b,a
3014 INK i: PLOT  OVER 1;43,p+a
3015 LET a=a+2: LET b=b+4: NEXT
i
3016 OVER 1: PRINT AT x,y; INK 0
;"      ";AT x-1,y;"      "
3020 OVER 0
3100 PRINT AT 10,7; INK 4; FLASH
 1;"G A M E  O V E R"
3120 IF INKEY$="" THEN  GO TO 31
20
3130 GO TO 13
9080 FOR i=0 TO 87: READ a: POKE
 USR "a"+i,a: NEXT i
9090 DATA 7,15,31,63,127,255,255
,129,0,129,195,231,254,254,255,2
55,255,134,3,1,0,0,255,129,240,1
2,3,128,192,96,255,255
9100 DATA 0,0,0,192,48,12,255,12
9,255,126,126,60,60,0,0,0,60,102
,231,153,153,231,102,60,56,60,12
4,124,254,255,255,255,60,90,153,
255,255,153,90,60
9110 DATA 0,1,1,3,3,7,7,255,0,12
8,128,192,192,224,224,255
9120 RETURN
9200 INK 2: FOR I=0 TO 6: PLOT i
*32,70: LET b=RND*80: DRAW 16,b:
 DRAW 16,-b: NEXT i: PLOT i*32,7
0: LET b=RND*80: DRAW 16,b: DRAW
 15,-b:
9210 RETURN
9300 LET x$=" . . . . . .
. . . . . J U M P  B U G G Y
 ..SINCLAIR PROGRAMS. . . . . .
. . . . . GUIDE YOUR BUGGY OVE
R THE PLANET'S SURFACE BY JUMPIN
G THE ROCKS AND POT HOLES. . . .
 . . . . . CONTROLS=ANY KEY. .
 . . . . . .PRESS ANY KEY TO
 START. . . . . .
. . . ."
9310 PRINT AT 0,11; INK 5;"J U M
 P"
9315 PRINT AT 11,11; INK 5;"B U
G G Y"
9320 FOR I=1 TO 252: BEEP .005,1
0: PRINT AT 21,0; INK 4;X$(I TO
I+30): BEEP .005,2: IF INKEY$<>"
" THEN  GO TO 9500
9350 NEXT i
9400 GO TO 9320
9500 FOR i=0 TO 21: PRINT AT i,0
; INK 0;"(32*ig8)": NEXT i: GO T
O 14
```

SPIDER SENTRIES

EXPLORE the treasure vaults in the lost city in search of gold. The vaults are patrolled by **Spider sentries** who attack any intruders. To open the treasure chests you must touch the tops of them whilst taking care to avoid the spiders. If you wish to move on to the next vault, stand four steps away from the wall and shoot a hole through it.

Written for the 16K Spectrum by Andrew Sherwood of West Bromwich, West Midlands.

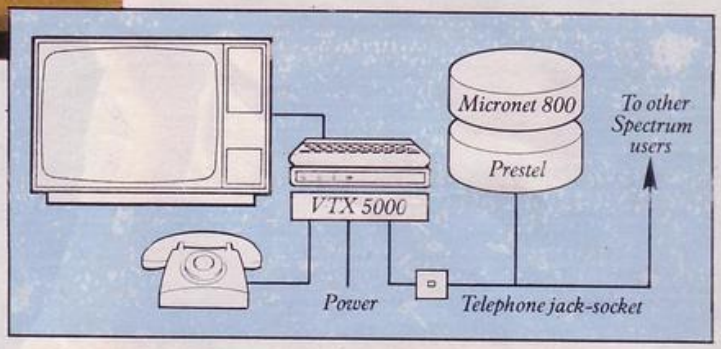
```
  2 CLS : RESTORE : GO TO 4000
  5 FOR k=1 TO 3: FOR j=0 TO 7:
 PRINT  INK j;AT s1,s2;"E": BEEP
 .007,j*4: NEXT j: NEXT k: LET s
=s+10
  7 PRINT AT s1,s2;" ";AT 0,6;s
  8 LET s1=3+INT (RND*17)
  9 LET s2=30: RETURN
 30 FOR k=1 TO 3: FOR j=7 TO 0
STEP -1: PRINT  INK j;AT s1,s2;"
C": BEEP .01,j*3: NEXT j: NEXT k
: LET li=li-1: PRINT AT m1,m2;"
";AT 0,31;li
 35 IF li=0 THEN  PRINT AT 11,0
: FLASH 1;"            GAME  OVER
          ": FOR j=1 TO 5: FOR
i=30 TO -30 STEP -2: BEEP .01,i:
 NEXT i: NEXT j: GO TO 5109
 40 GO TO 5136
1005 FOR i=1 TO 2
1007 BEEP .0004,i*20+20
1010 LET sy=s1: LET sx=s2
1015 IF RND>.7 THEN  LET s1=s1+(
-1+INT (RND*3)): GO TO 1030
1020 LET s1=s1+((s1<m1)-(s1>m1))
1030 LET s2=s2+((s2<m2)-(s2>m2))
1035 IF ATTR (s1,s2)=58 THEN  LE
T s1=sy: LET s2=sx
1040 PRINT AT sy,sx;" ";AT s1,s2
;s$(i)
1045 IF s1=m1 AND s2=m2 THEN  GO
 TO 30
1050 LET my=m1: LET mx=m2
1060 LET m1=m1+(INKEY$="a")-(INK
EY$="q")
1070 LET m2=m2+(INKEY$="p")-(INK
EY$="o")
1080 IF ATTR (m1,m2)=58 THEN  LE
T m1=my: LET m2=mx
1090 PRINT AT my,mx;" ";AT m1,m2
;m$(i)
1111 IF INKEY$="k" THEN  IF m2<2
8 THEN  PLOT m2*8+8,(21-m1)*8+4:
 DRAW 31,0: FOR j=30 TO 40: BEEP
 .007,j: NEXT j: PRINT AT m1,m2+
1;"     ": IF s1=m1 AND s2>m2 AND
 (s2-m2)<5 THEN  GO SUB 5
1130 IF ATTR (m1+1,m2)=57 THEN
FOR j=14 TO 32 STEP 3: BEEP .01,
j: NEXT j: LET s=s+50: PRINT AT
m1+1,m2;" ";AT 0,6;s
1140 IF m2=31 THEN  FOR j=1 TO 1
0: BEEP .03,-20: BEEP .03,-10: B
EEP .03,0: NEXT j: GO TO 5113
1300 NEXT i: GO TO 1000
4011 PRINT  PAPER 6;" S P I D E
R    S E N T R I E S "
4020 PRINT '"IN A LOST CITY, YOU
 FIND          TREASURE VAULTS, WH
ICH YOU       EXPLORE IN SEARCH O
F GOLD.       TAKE AS MUCH GOLD A
S YOU CAN -   OPEN EACH TREASURE
CHEST BY      TOUCHING THE "; FLA
SH 1;"TOP"
4030 PRINT  PAPER 6;"BEWARE OF T
HE SPIDER SENTRIES    WHO ATTACK
ANY INTRUDER.         USE YOUR LA
SER GUN TO DEFEND     YOURSELF.
                      "
4040 PRINT "TO ESCAPE FROM ONE V
AULT TO THE NEXT, SHOOT A HOLE T
HROUGH THE   WALL ON THE RIGHT
             (STAND 4 STEPS FROM
THE WALL)."
4050 PRINT  PAPER 6;AT 17,11;" U
P    q ";AT 18,11;" DOWN  a ";AT
 19,11;" LEFT  o ";AT 20,11;" RI
GHT p ";AT 21,11;" FIRE  k "
4060 PRINT #0;"       PRESS A KEY
 TO START      "
4300 PAUSE 0: BEEP .5,15
5000 FOR i=USR "a" TO USR "g"+7:
 READ j: POKE i,j: NEXT i
5005 DATA 0,0,0,189,255,189,129,
129,60,60,126,129,129,129,129
5010 DATA 129,56,56,16,56,124,18
6,40,68,56,56,16,56,40,40,16,16
5015 DATA 16,40,68,98,86,42,28,8
,255,1,125,69,85,93,65,127,0,126
,66,90,90,66,126,0
5090 LET s=0: LET h=0
5100 LET s$="AB": LET m$="CD"
5109 IF s>h THEN  LET h=s
5110 LET m1=11: LET v=0: LET s=0
: LET li=3
5115 CLS : FOR i=2 TO 20: PRINT
 INK 2;AT i,0;"G";AT i,31;"G": N
EXT i
5118 PRINT  INK 2;AT 1,0;"FGFGFG
FGFGFGFGFGFGFGFGFGFGFGFGFGFG";AT 2
1,0;"FGFGFGFGFGFGFGFGFGFGFGFGFGFGF
GFGFG"
5119 FOR i=1 TO 14: PRINT  INK 1
;AT 3+RND*17,1+RND*29;"E": NEXT
i
5120 PRINT  INK 2;AT 6,12;"FFFFF
FFFFFFFFF";AT 16,12;"FFFFFFFFFFFF
FFF";AT 11,6;"FFFFFFFFFFFFFFF"
5130 PRINT AT 6,16;" ";AT 6,21;"
 ";AT 16,16;" ";AT 16,21;" ";AT
11,10;" ";AT 11,15;" "
5133 LET v=v+1: PRINT #0; INK 3;
"          VAULT ";v
5136 LET s1=3+INT (RND*17): LET
s2=30: LET m2=1
5140 PRINT  INK 3;AT 0,0;"SCORE"
;AT 0,16;"HI";AT 0,30;"C"
5145 PRINT AT 0,6;s;AT 0,19;h;AT
 0,31;li;AT m1,1;"C"
5190 FOR j=-20 TO 50 STEP 2: BEE
P .01,j: NEXT j: GO TO 1000
```

Sneak into a mainframe with your Spectrum...

...and access an of news, view

Games

Travel



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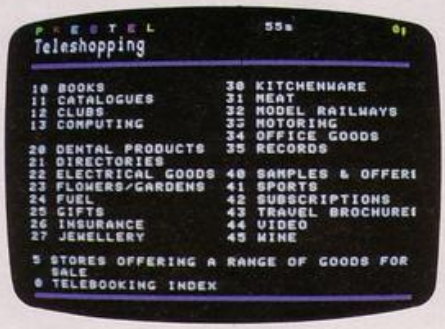

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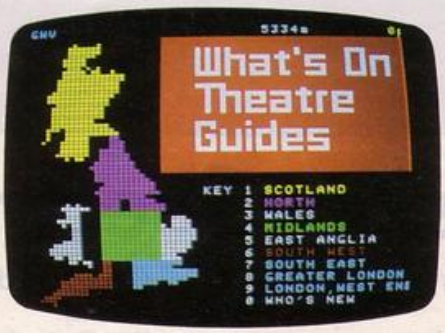

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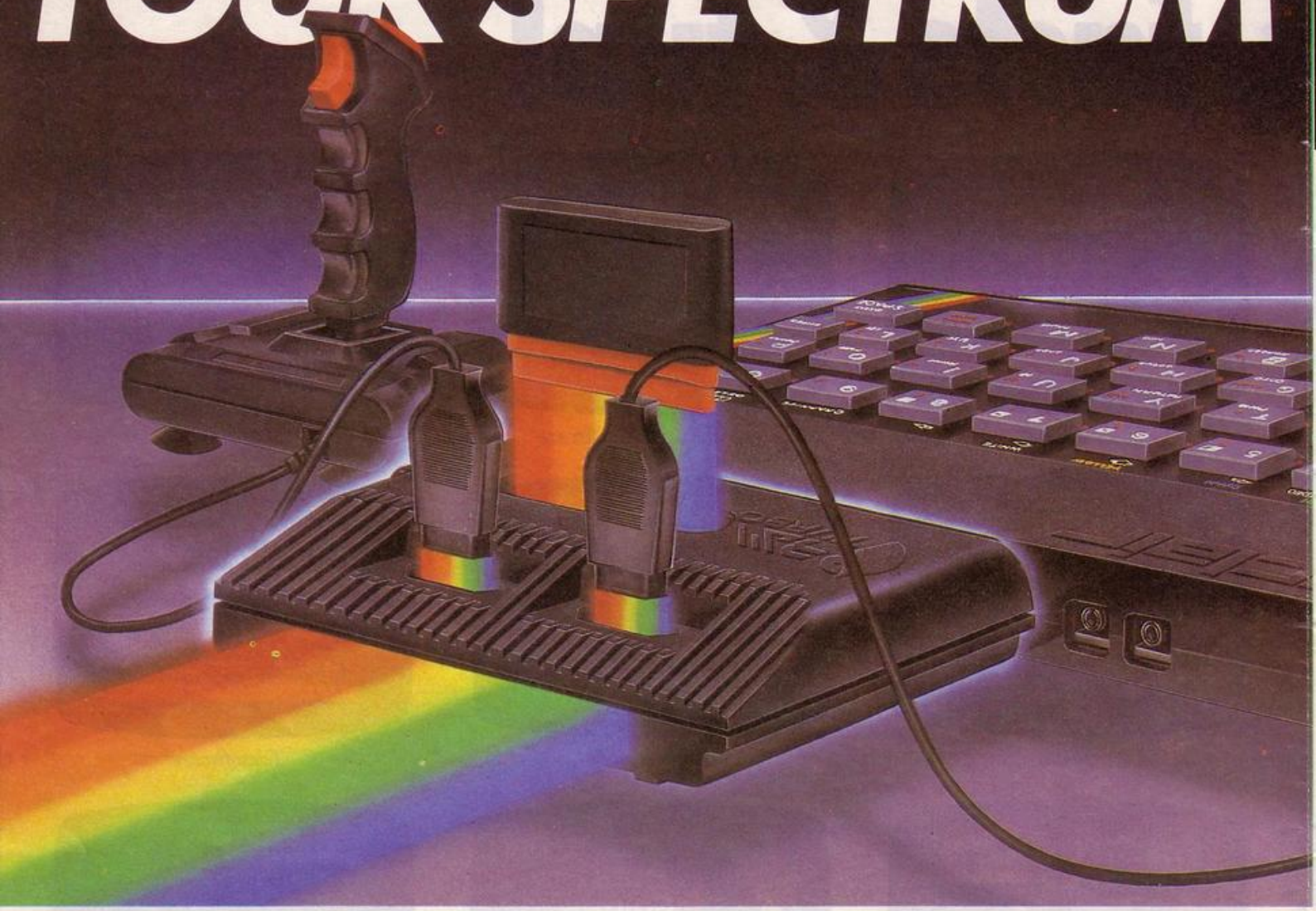

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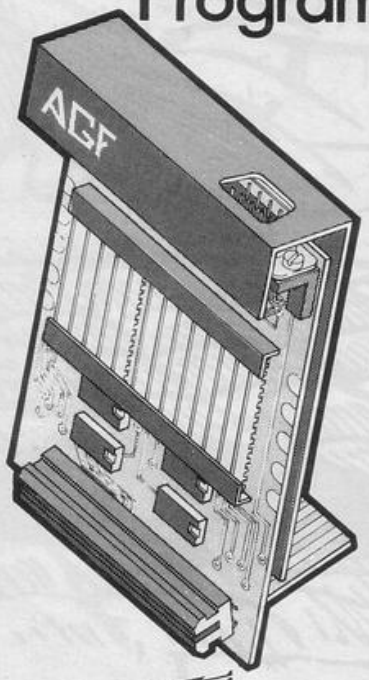
Programmable Interface



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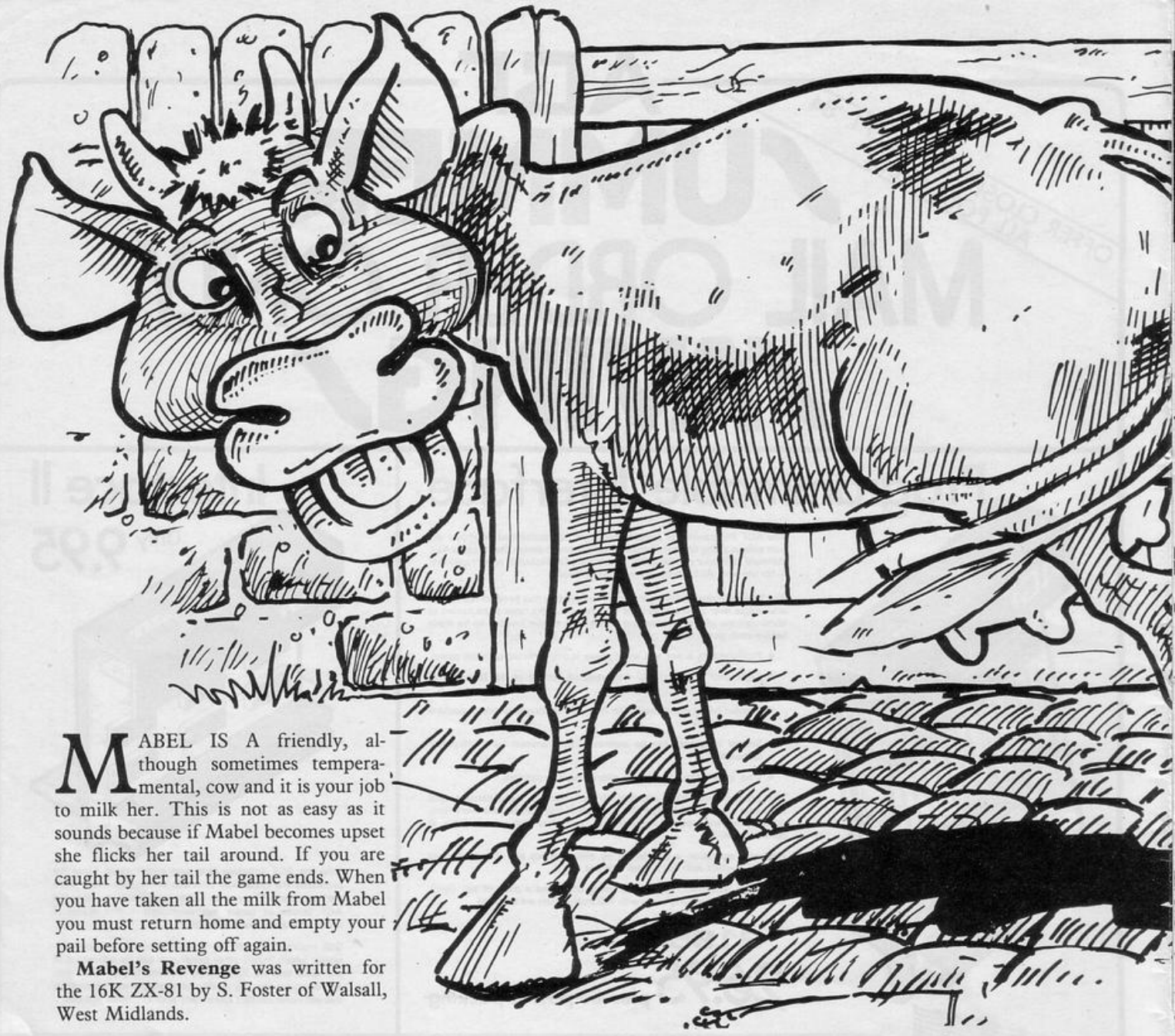
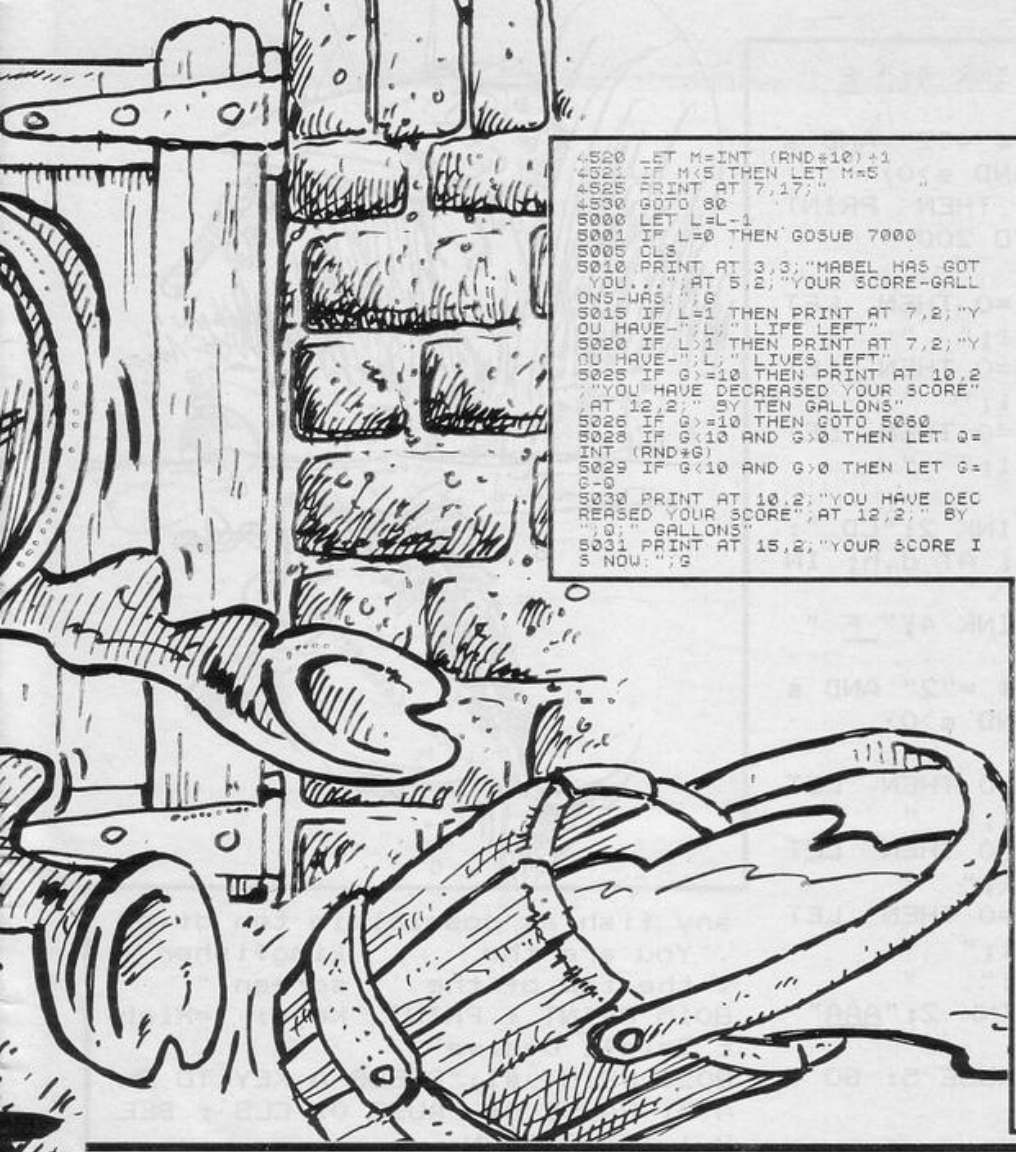


MABEL IS A friendly, although sometimes temperamental, cow and it is your job to milk her. This is not as easy as it sounds because if Mabel becomes upset she flicks her tail around. If you are caught by her tail the game ends. When you have taken all the milk from Mabel you must return home and empty your pail before setting off again.

Mabel's Revenge was written for the 16K ZX-81 by S. Foster of Walsall, West Midlands.

MABEL'S REVENGE

```
  4 CLS
  5 GOSUB 8000
  6 CLS
  7 LET L=3
  8 LET G=0
 10 CLS
 11 FOR C=16 TO 20
 12 PRINT AT C,0;"
                  "
 14 NEXT C
 15 LET M=INT (RND*10)+1
 20 IF M<5 THEN LET M=5
 30 LET X=15
 40 LET Y=24
 50 LET A=INT (RND*50)+5
 55 PRINT AT 18,1;"■GALLONS-";G
;"■";AT 18,21;"■LIVES-";L;"■
 60 PRINT AT 16,0;"
                  "
 61 PRINT AT 0,0;"■+          MABE
LS REVENGE      +■"
 62 PRINT AT 21,0;"■+          MAB
ELS REVENGE     +■"
 65 PRINT AT 12,31;"/";AT 13,31
;"■";AT 14,31;"■";AT 15,31;"■"
 70 GOSUB 1000
 80 PRINT AT X,Y;" U■ "
 85 PRINT AT 12,15;"     "
 90 LET A=A-1
100 LET Y=Y+(INKEY$="8" AND Y<2
7)-(INKEY$="5" AND Y>11)
110 IF A=0 THEN GOTO 4050
120 IF X=15 AND Y=14 THEN PRINT
AT X,Y-1;"▗"
121 IF X=15 AND Y=27 THEN PRINT
AT 18,10;G;"■"
122 IF X=15 AND Y=27 THEN PRINT
AT 11,19;"  "
124 IF X=15 AND Y=27 THEN PRINT
AT 8,10;"GO AND GET SOME MORE"
125 IF X=15 AND Y<26 THEN PRINT
AT 8,10;"                    "
130 IF X=15 AND Y<=13 AND INKEY
$="M" THEN GOSUB 3000
990 GOTO 80
1000 PRINT AT 11,8;"  ▗▀▖  "
1001 PRINT AT 12,8;" ▐▄▄▌ "
1002 PRINT AT 13,8;"  ▌▐  "
1003 PRINT AT 14,8;"  U   "
1004 PRINT AT 15,8;"      "
1010 RETURN
2000 IF X=15 AND Y>=17 THEN GOTO
 4000
2020 PRINT AT 8,17;"GOTCHA..."
2025 PRINT AT 11,15;" ";AT 12,14
;"  "
2030 FOR N=1 TO 20
2035 IF Y=13 THEN PRINT AT 15,13
;"▗"
2040 PRINT AT 13,14;"▖";AT 14,14
;"▌";AT 15,14;"▘";AT 13,14;" ";A
T 14,14,"  ";AT 15,14;"  "
2050 PRINT AT 11,14;"▝";AT 12,14
;"▗";AT 11,14;" ";AT 12,14;" "
2060 NEXT N
2070 PRINT AT 11,15;"▖";AT 12,14
;"▗"
2075 IF Y=13 THEN PRINT AT X,Y;"
▗U▖"
2086 LET A=A-1
2090 PAUSE 100
2095 GOSUB 5000
3000 IF INKEY$="M" THEN GOTO 302
0
3010 RETURN
3020 IF X=15 AND Y<=13 THEN GOTO
 3035
3030 RETURN
3035 IF M<=1 THEN GOSUB 4500
3036 IF INKEY$="M" THEN LET M=M-
1
3037 IF INKEY$="M" THEN LET G=G+
1
3040 PRINT AT 7,17;"MILKING";AT
7,17;"  "
3041 PRINT AT 14,12;" ";AT 14,12
;"U"
3045 IF X=15 AND Y>=13 THEN GOTO
 3080
3055 LET A=A-1
3065 IF A=0 THEN GOSUB 2000
3070 IF M<=1 THEN PRINT AT 11,19
;"EMPTY";AT 7,17;"      ";AT 14
,12;"U"
3075 IF M<=1 THEN GOSUB 4500
3090 RETURN
4000 IF Y<=19 THEN PRINT AT 3,5;
"NEARLY HAD YOU THAT TIME"
4010 GOSUB 6000
4050 IF Y>=14 THEN GOTO 4000
4060 IF Y<=15 THEN GOTO 2000
4500 LET G=G
4510 LET Y=Y+2
4515 PRINT AT X,Y-1;" ";AT 15,13
;"▗"
```



```
4520 LET M=INT (RND*10)+1
4521 IF M<5 THEN LET M=5
4525 PRINT AT 7,17;"  "
4530 GOTO 80
5000 LET L=L-1
5001 IF L=0 THEN GOSUB 7000
5005 CLS
5010 PRINT AT 3,3;"MABEL HAS GOT
 YOU...";AT 5,2;"YOUR SCORE-GALL
ONS-WAS:";G
5015 IF L=1 THEN PRINT AT 7,2;"Y
OU HAVE-";L;" LIFE LEFT"
5020 IF L>1 THEN PRINT AT 7,2;"Y
OU HAVE-";L;" LIVES LEFT"
5025 IF G>=10 THEN PRINT AT 10,2
;"YOU HAVE DECREASED YOUR SCORE"
,AT 12,2;" BY TEN GALLONS"
5026 IF G>=10 THEN GOTO 5060
5028 IF G<10 AND G>0 THEN LET Q=
INT (RND*G)
5029 IF G<10 AND G>0 THEN LET G=
G-Q
5030 PRINT AT 10,2;"YOU HAVE DEC
REASED YOUR SCORE";AT 12,2;" BY
";Q;" GALLONS"
5031 PRINT AT 15,2;"YOUR SCORE I
S NOW:";G
5032 PAUSE 250
5040 CLS
5050 GOTO 11
5060 LET G=G-10
5070 GOTO 5031
6010 PRINT AT 13,15;" ";AT 12,14
;"  "
6020 FOR N=1 TO 10
6030 PRINT AT 13,14;"▚";AT 14,14
;"▐";AT 15,14;"▞";AT 13,14;" ";A
T 14,14;"  ";AT 15,14;"  "
6040 PRINT AT 11,14;"▞";AT 12,14
;"▚";AT 11,14;" ";AT 12,14;" "
6045 PRINT AT X,Y;" U"
6050 NEXT N
6060 PRINT AT 11,15;"▚";AT 12,14
;"▞"
6065 PRINT AT 3,5;"
                    "
6070 LET A=INT (RND*30)+5
6080 GOTO 60
7000 CLS
7005 PRINT AT 6,0;"YOU HAVE LOST
 ALL OF YOUR LIVES";AT 8,8;"YOUR
 SCORE WAS:";G
7010 PRINT AT 12,8;"ANOTHER GO ?
(Y/N)"
7020 INPUT A$
7030 IF INKEY$<>"" THEN GOTO 703
0
7040 IF A$="Y" THEN GOTO 6
7050 IF A$<>"Y" THEN STOP
8000 PRINT AT 0,0;"▚▚          MABE
LS REVENGE          ▚▚"
8010 PRINT AT 21,0;"▚▚          MAB
ELS REVENGE          ▚▚"
8020 PRINT AT 3,5;"MABEL IS A FR
IENDLY COW"
8025 PRINT AT 4,1;"""OUTSTANDING
"" IN HER FIELD, BUT"
8030 PRINT AT 5,2;"SHE IS A LITT
LE TEMPERAMENTAL"
8040 PRINT AT 8,2;"TRY AND GET A
S MUCH MILK FROM"
8050 PRINT AT 9,2;"HER AS YOU CA
N, BUT WATCH OUT";AT 10,5;"FOR H
ER SWOOSHING TAIL"
8055 PRINT AT 11,1;"TAKE YOUR MI
LK BACK TO YOUR DEN"
8060 PRINT AT 13,2;"USE KEYS 5-8
 TO MOVE YOUR MAN";AT 14,9;"WITH
 THE BUCKET"
8065 PRINT AT 16,2;"WHEN MABELS
TAIL ""TURNS"" YOU";AT 17,3;"WIL
L ""FREEZE"" WITH FRIGHT"
8070 PRINT AT 18,9;"USE ""M"" TO
 MILK"
8080 PRINT AT 19,6;"PRESS ANY KE
Y TO START"
8090 IF INKEY$="" THEN GOTO 8090
9000 GOTO 6
9100 SAVE "MABEL"
9110 GOTO 1
```

kingfisher

```
  5 CLS
 10 LET hs=0
 15 GO SUB 9000
 20 GO SUB 8000
 25 REM *** VARIABLES ***
 26 LET score=0: LET dives=10

 30 LET a=1: LET s=20
 35 LET d=19: LET f=28: LET g=1
8: LET h=6
 40 REM *** MAIN LOOP ***
 45 FOR z=0 TO 31
 50 PRINT  AT 2,z; INK 2;"A"
 55 PRINT  AT 18,z; INK 1; PAPE
R 5;"B"
 60 BEEP .002,z
 65 NEXT z
 70 PRINT  AT d,f; INK 2;"CD ";
 AT d,g; INK 2;"CD "; AT d,h; IN
K 2;"CD "
 75 PLOT 0,9: DRAW  INK 1;255,0

 80 PRINT  AT 21,3; INK 3;"SCOR
E=";score; AT 21,21; INK 3;"DIVE
S=";dives
```

USE KEYS 1 and 2 to move the **Kingfisher,** and 0 to make him dive. Ten points are scored for each fish the kingfisher catches, so make the most of the ten dives you are given.

Kingfisher was written for the 16K Spectrum by Duncan Larkman of Ormesby, Middlesbrough.

```
  85 PRINT  AT a,s; INK 4;" E "

  90 LET s=s+( INKEY$ ="2" AND s
<29)-( INKEY$ ="1" AND s>0)
  95 IF  INKEY$ ="0" THEN  PRINT
  AT a,s;"   ": GO TO 200
 100 BEEP .003,0
 105 LET f=f-1: IF f=0 THEN  LET
 f=29: PRINT  AT 19,1;"  "
 110 LET g=g-1: IF g=0 THEN  LET
 g=29: PRINT  AT 19,1;"  "
 115 LET h=h-1: IF h=0 THEN  LET
 h=29: PRINT  AT 19,1;"  "
 120 GO TO 70
 200 PRINT  AT d,f; INK 2;"CD ";
 AT d,g; INK 2;"CD "; AT d,h; IN
K 2;"CD "
 205 PRINT  AT a,s; INK 4;" F "

 206 LET s=s+( INKEY$ ="2" AND s
<29)-( INKEY$ ="1" AND s>0)
 210 LET a=a+1
 215 LET f=f-1: IF f=0 THEN  LET
 f=29: PRINT  AT 19,1;"  "
 220 LET g=g-1: IF g=0 THEN  LET
 g=29: PRINT  AT 19,1;"  "
 225 LET h=h-1: IF h=0 THEN  LET
 h=29: PRINT  AT 19,1;"  "
 230 PRINT  AT a-1,s;"   "
 235 PRINT  AT 2,s; INK 2;"AAA"

 240 IF a=19 THEN  PAUSE 5: GO T
O 300
 245 BEEP .003,0
 250 PAUSE 3
 255 GO TO 200
 300 LET dives=dives-1
 305 IF dives=0 THEN  GO TO 400

 310 PRINT  AT 18,s; INK 1;"B"

 315 IF s+1=f OR s+1=f+1 OR s+1=
g+1 OR s+1=g OR s+1=h+1 OR s+1=h
 THEN  LET score=score+10
 320 PAUSE 10: CLS : GO TO 30
 400 BEEP .3,12: BEEP .3,7: BEEP
 .3,-8: BEEP .05,12: BEEP .5,5

 401 CLS : PRINT  AT 0,10;"HARD
LUCK!!!": PRINT : PRINT "You sco
red:";score
 405 IF score>hs THEN  PRINT  AT
 5,5; FLASH 1; INK 5;"NEW HIGHES
T SCORE": LET hs=score
 410 PRINT  AT 8,2;"THE HIGHEST
SCORE IS:";hs
 420 LET dives=10: LET score=0:
PAUSE 200: CLS : GO TO 30
8000 REM *** INSTRUCTIONS ***
8005 PRINT  AT 0,9;"KING FISHER"
; AT 0,9; OVER 1;"__________"

8010 PRINT  AT 2,0;"The object o
f the game is to    collect as m
```

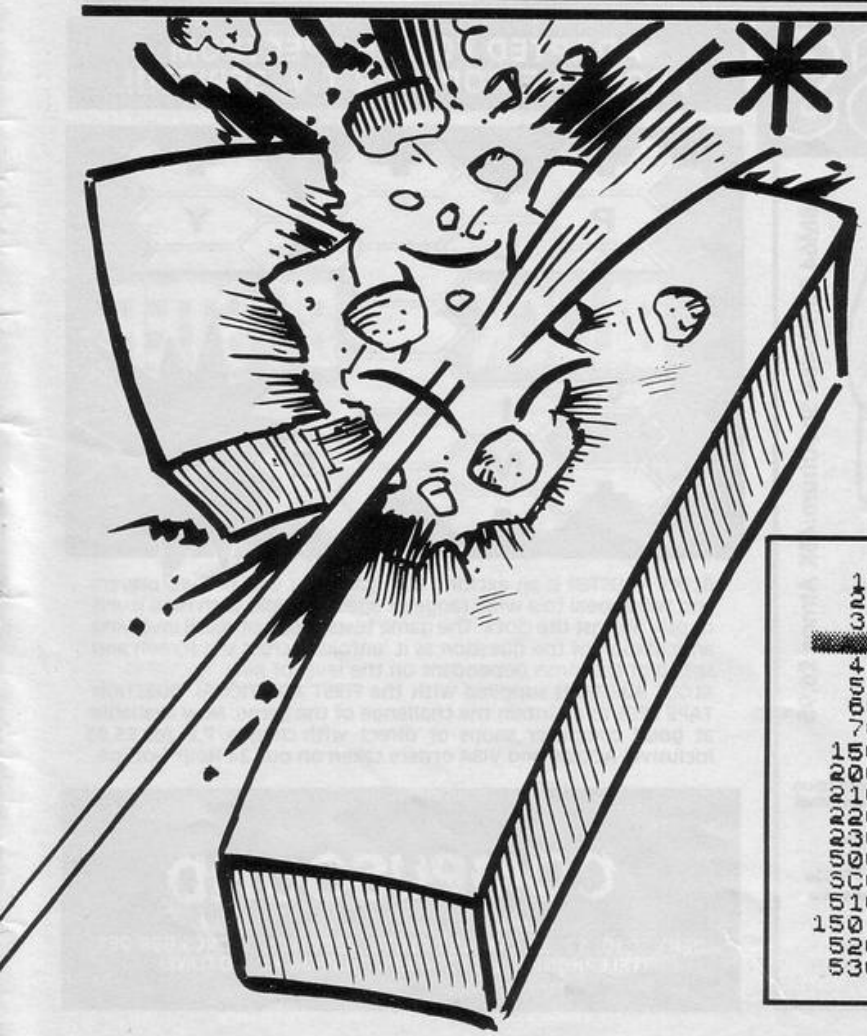
```
any fish as possiblein ten dives
. You are the       kingfisher a
t the top of the    screen."
8015 PRINT : PRINT "Keys: 1=Righ
t 2=left 0=dive"
8020 PRINT #1;"PRESS A KEY TO PL
AY": PAUSE 0: PAUSE 0: CLS : BEE
P 1,15: RETURN
9000 REM *** GRAPHICS ***
9005 FOR a= USR "a" TO  USR "f"+
7
9010 READ q
9020 POKE a,q
9030 NEXT a
9040 DATA 255, BIN 10111101, BIN
 01000010, BIN 00011010, BIN 101
00010, BIN 00100100, BIN 1101101
1,255
9050 DATA  BIN 00011100, BIN 001
11000, BIN 01111100,255,255,255,
255,255
9060 DATA  BIN 00000001, BIN 000
00011, BIN 00001111, BIN 0001101
1, BIN 00011111, BIN 00001111, B
IN 00000011, BIN 00000001
9070 DATA  BIN 10000000, BIN 111
00011, BIN 11110110, BIN 1111110
0, BIN 11111100, BIN 11111100, B
IN 11110110, BIN 10000011
9080 DATA  BIN 00011100, BIN 001
10100, BIN 00011100, BIN 0111111
1, BIN 01111111, BIN 01111111, B
IN 01001001, BIN 00011000
9090 DATA  BIN 00111100, BIN 100
11001, BIN 11011011,255,255, BIN
 00100100, BIN 00011000, BIN 000
11000
9100 RETURN
```

SIDE SHOW

BIRDS pass in front of you on a side stall at a fairground. You are given twenty stones by the fairground worker and have to throw the stones at the birds. Points will be awarded according to the number of birds hit.

Side Show was written for the 16K Spectrum by Graham Creasey of Ashford, Kent.

```
  10 PAPER 1: INK 7: BORDER 1: C
LS
  20 FOR n=USR "a" TO USR "r"+7:
 READ a: POKE n,a: NEXT n
  30 DATA 7,15,15,31,31,15,7,7,1
28,192,192,224,224,192,128,128,3
,3,7,7,63,127,239,207,0,0,128
  40 DATA 128,255,255,192,192,20
7,207,207,207,111,111,15,15,192,
192,192,192,192,192,192,192
  50 DATA 15,15,15,15,12,12,12,1
2,12,24,24,24,24,56,248,192,9
6,96,96,96,96,112,124,48,48,96
  60 DATA 192,128,0,0,0,0,0,0,12
,252,240,0,0,0,0,0,48,48,48,0,0,
0,0,0,7,12,14,6,131,0,0,0,129
  70 DATA 195,99,35,187,0,0,240,
240,216,255,254,240,199,127,63,6
3,15,0,0,0,221,254,255,255
  80 DATA 254,0,0,0,224,192,192,
128,0,0,0,0
  90 PRINT  PAPER 2; INK 7;AT 9,
0;" TRY TO HIT AS MANY BIRDS AS
    POSSIBLE WITH YOUR 20 STONES
.   PRESS ANY KEY TO THROW STONE
.  ": FOR n=20 TO 0 STEP -.25: B
EEP .005,n: NEXT n: FOR n=0 TO 2
00: NEXT n: CLS
 100 LET f=0: LET st=20
 110 LET k=0: LET x=16: LET b=0:
 CLS
 120 PRINT AT 21,0; PAPER 6;"
                             "
 130 PRINT AT 16,25; INK 7;"AB";
AT 17,25;"CD";AT 18,25;"EF";AT 1
9,25;"GF";AT 20,25;"HI"
 140 LET a=INT (RND*5)+2
 150 PRINT AT 0,0; PAPER 2;" BIR
DS HIT=      STONES LEFT=     "
 160 PRINT  PAPER 2;AT 0,11;f;AT
 0,28;st;" "
 170 PRINT AT 17,27;"K"
 180 IF st=0 THEN  GO TO 310
 190 IF INKEY$<>"" AND k=0 THEN
 GO SUB 250
 200 IF k=1 THEN  GO SUB 250
 210 IF k=0 THEN  FOR n=1 TO 5:
NEXT n
 220 PRINT AT a,b; INK (RND*2)+4
;" MNO";AT a+1,b;" PQR"
 230 LET b=b+1: IF b=27 THEN  PR
INT AT a,b;"    ";AT a+1,b;"
": LET b=0: GO TO 140
 240 BEEP .001,50: GO TO 160
 250 PRINT AT 17,27;"J": LET k=1
: PRINT AT x,27; INK 3;"L": LET
x1=x: LET x=x-1: IF x=0 THEN  PR
INT AT x1,27;" ": LET x=16: LET
st=st-1: LET k=0: RETURN
 260 IF SCREEN$ (x,27)<>" " THEN
  GO TO 290
 270 PRINT AT x1,27;" ";AT x,27;
 INK 3;"L"
 280 RETURN
 290 FOR n=-10 TO 10: BEEP .005,
n: BEEP .005,n*2: NEXT n
 300 LET f=f+1: LET st=st-1: GO
TO 110
 310 BEEP .5,-15: BEEP .5,-10: B
EEP .5,-5: BEEP .5,-5: BEEP .5,-
10: BEEP .5,-15
 320 CLS : PRINT AT 0,0;"You hit
 ";f;" birds with your""20 ston
es."
 330 PRINT AT 5,0; INK 5;"  PRES
S ANY KEY TO PLAY AGAIN  ": PAUS
E 0: BEEP .05,-10: RUN
```



NUMBER BLAST

A RANDOM asterisk will move from the left of the screen to the number opposite it on the right. The asterisk takes about a second to reach the number and you must have your finger pressed on the corresponding number on the keyboard before it does so. The game begins again if the asterisk arrives first, and one point can be gained for each number pressed.

Number Blast was written for the 1K ZX-81 by A West of Dolphinholme, Lancaster.

```
  10 LET S=-1
  20 FOR D=0 TO 12
  30 PRINT AT D,3;"
                  "
  40 NEXT D
  50 FOR A=1 TO 9
  60 PRINT AT A,4;"*";TAB 25;A
  70 NEXT A
 150 LET B=INT (RND*9)+1
 200 LET S=S+1
 210 FOR C=5 TO 23
 220 PRINT AT B,C;"*"
 230 NEXT C
 500 PRINT AT B,C;"";AT 11,10;"
 SCORE : ";S;"  "
 510 IF INKEY$=STR$ B THEN GOTO
150
 520 PAUSE 300
 530 RUN
```

SCAFFOLDING

RUN INTO the flashing diamonds on each level and the **Scaffolding** will appear. Climb the scaffolding to the next level and continue this procedure to the top of the screen where you will be able to rescue your maiden before the ghost reaches her. If the scaffolding does not appear it may be underneath the diamond. Use keys O, P and Z to play.

Written for the 16K Spectrum by Paul Gibson, of Nuneaton, Warks.

```
  1 LET q=20
  2 GO SUB 150
  3 FOR f=21 TO 3 STEP -2
  4 INK 2: PRINT AT f,0;"(32*i
X)": NEXT f
  5 LET g=0
  6 INK 3: PRINT AT 2,29; CHR$
 (147)
 10 LET a=0
 20 LET b=20
 30 LET c= INT ( RND *15+1)*2
 40 LET d= INT ( RND *15+1)*2
 50 LET e=0
 60 FOR f=0 TO q
 80 INK 6: PRINT AT b,a; CHR$
(144): INK 5: PRINT AT b,c; CHR
$ (146): INK 4: PRINT AT 2,g; C
HR$ (145)
 90 PRINT AT b,a;" ": PRINT A
T b,c;" ": PRINT AT 2,g;" "
100 IF INKEY$ ="p" THEN LET a
=a+1
110 IF INKEY$ ="o" THEN LET a
=a-1
120 IF a=c THEN PRINT AT b,d;
"H"
125 IF g=28 THEN CLS : PRINT
AT 11,0;"He Now Has Your Maiden"
: STOP
127 IF b=2 AND a=29 THEN CLS :
PRINT AT 11,0;"You Have Rescue
d The Maiden": PAUSE 100: LET q=
q-3: GO TO 3
130 IF INKEY$ ="z" AND a=d THE
N LET b=b-2: GO TO 30
135 IF f=q THEN LET g=g+1: GO
TO 60
140 LET f=f+1: GO TO 80
150 PAPER 0: BORDER 0: INK 7: C
LS
200 FOR f=0 TO 3: FOR g=0 TO 7:
READ a: POKE USR CHR$ (144+f)
+g,a: NEXT g: NEXT f
210 DATA 28,28,8,62,93,20,20,54
220 DATA 28,62,42,107,127,127,1
09,73
230 DATA 60,66,129,66,36,24,0,0
240 DATA 28,28,8,62,93,60,127,3
6
250 RETURN
300 SAVE "scafold" LINE 1
```

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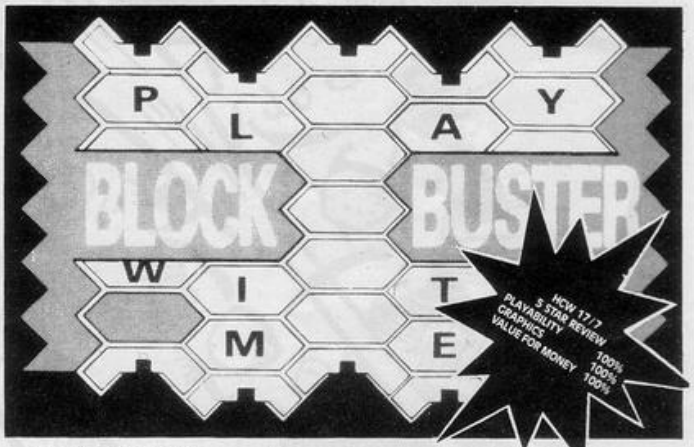

BLOCK—BUSTER is an exciting quiz game for ONE or TWO players and will appeal to a wide range of ages and skills with nine levels of play against the clock. The game tests speed of recall involving anticipation of the question as it 'unfolds' across the screen and speed of response dependant on the level of play.
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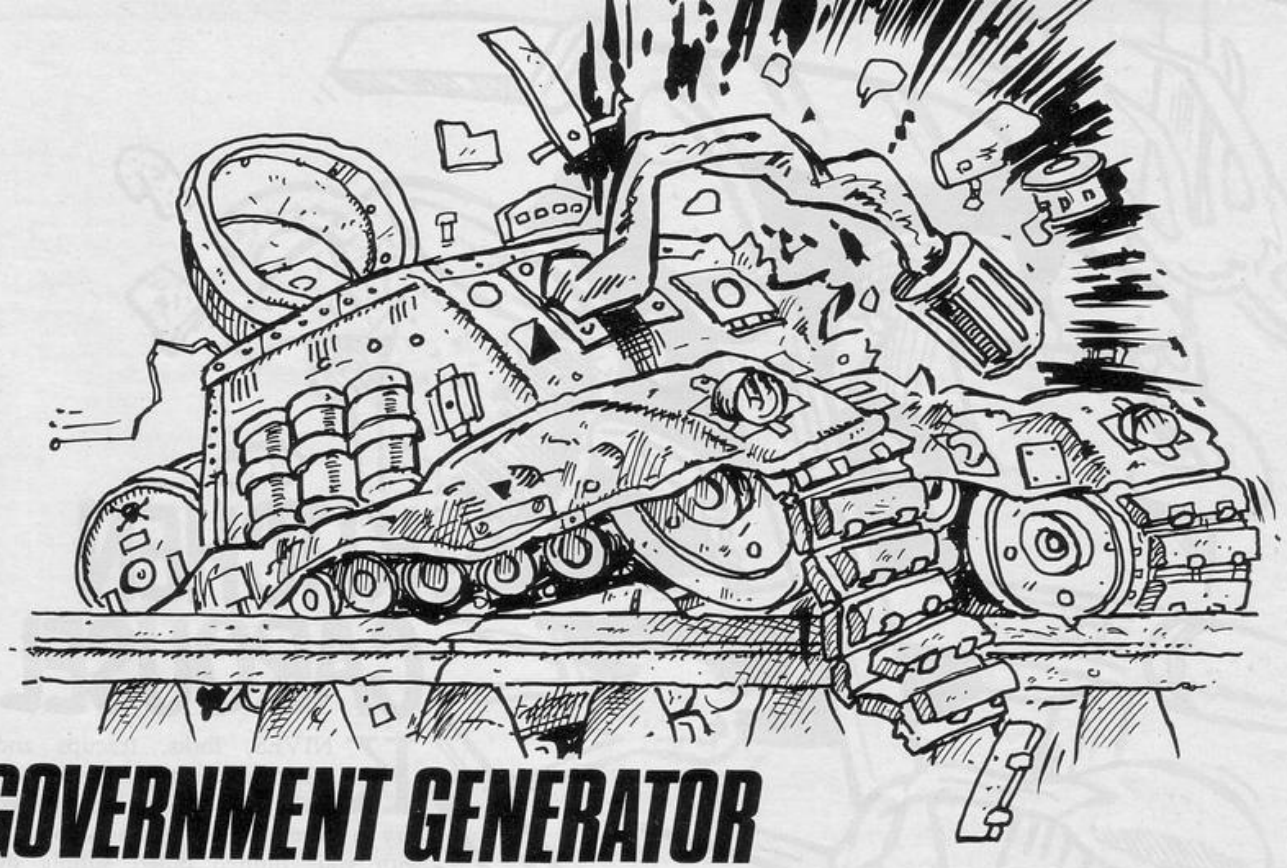


GOVERNMENT GENERATOR

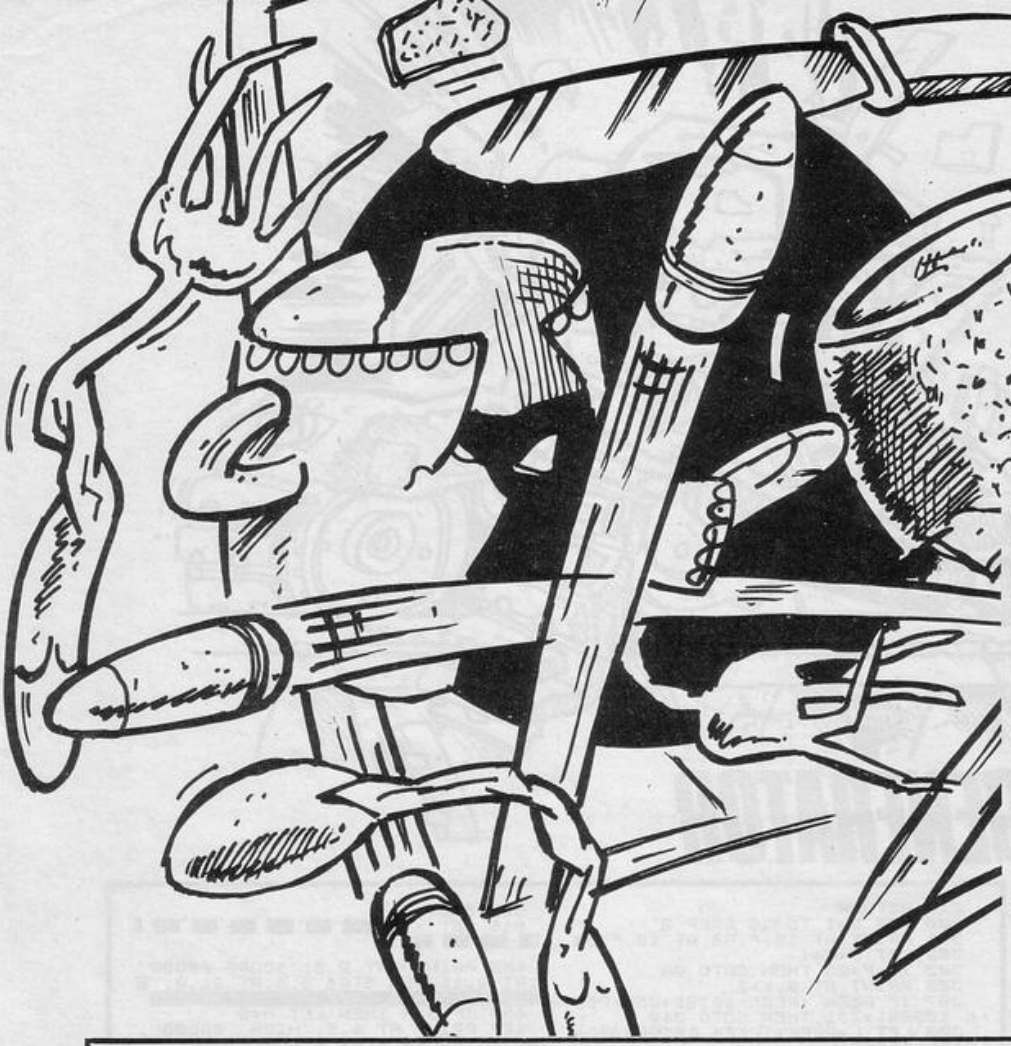
THE GOVERNMENT are building a high voltage power generator to prevent you, the fearsome enemy, from landing your Martian craft. The parts for the generator are carried over the bridge on tanks. To prevent the tanks reaching their destination you have to bomb them through the gaps in the force field. When the tanks have placed all the parts under the arches in the bridge you must bomb the vehicle holding the power supply or you will be doomed.

Government Generator was written for the 16K ZX-81 by John Wood of Wednesbury, West Midlands.

```
  2 LET H=0
  3 GOSUB 1000
  4 LET S=0
  5 LET A$="
  6 LET B$="T
  7 LET C$="
 10 LET X=13
 15 LET O=27
 20 PRINT AT 16,0;"TTTTTTTTTTTTT
TTTTTTTTTTTTTTTTTTTT"
 30 PRINT "
 35 PRINT "
 40 FOR F=19 TO 20
 50 PRINT AT F,0;"
 60 NEXT F
 65 PRINT AT 20,0;"";AT 20,31;
""
 70 PRINT "
 75 FOR F=0 TO 27
 76 LET C$=C$+C$(1)
 77 LET C$=C$(2 TO )
 78 PRINT AT 10,0;C$;
 79 PRINT AT 0,X;"  ";AT 1,X
-1;"  "
 80 IF INKEY$="0" THEN GOSUB 30
0
 85 PRINT AT 15,F;A$;AT 16,F;B$
 90 LET X=X+(INKEY$="8" AND X<2
7)-(INKEY$="5" AND X>1)
 95 NEXT F
 96 PRINT AT 15,28;"    ";AT 16
,28;"TTTT"
 97 IF O=37 THEN GOTO 500
 98 PRINT AT 20,O;"  ";AT 19,O
;"  "
 99 LET O=O-5
100 IF O<0 THEN GOSUB 200
110 GOTO 75
200 LET A$="
201 LET B$="T
202 LET O=37
```

```
210 RETURN
300 FOR G=1 TO 16 STEP 3
301 PRINT AT 15,F;A$;AT 16,F;B$
302 LET F=F+1
303 IF F=28 THEN GOTO 96
305 PRINT AT G,X+2;
307 IF PEEK (PEEK 16398+256+PEE
K 16399)=131 THEN GOTO 340
309 LET L=PEEK (PEEK 16398+256+
PEEK 16399)
310 IF L<>0 AND L<>3 AND L<>57
THEN GOTO 350
315 PRINT "U";AT G,X+2;" "
320 NEXT G
325 PRINT AT 16,X+2;"T"
330 RETURN
340 PRINT AT G,X+2;"";AT G,X+2
;""
345 RETURN
350 LET S=S+75
360 FOR I=1 TO 10
370 PRINT AT 15,F;"  ";AT 16,
F;"  ";AT 15,F;"  ";AT 16,F;
"  "
380 NEXT I
390 PRINT AT 15,F;"    ";AT 16,
F;"TTTT"
393 IF L=CODE "" OR L=CODE ""
OR L=CODE "" THEN GOTO 400
394 GOTO 75
400 LET S=S+1000
405 LET C=F
406 LET Y=17
407 FOR G=10 TO 0 STEP -1
408 PRINT AT 15,C;CHR$ G;CHR$ G
;CHR$ G;CHR$ G
409 NEXT G
410 FOR G=14 TO 0 STEP -1
420 PRINT AT G-1,C-1;"";TAB Y+
1;"";AT G,C;"  ";TAB Y;" "
430 LET C=C-1
440 LET Y=Y+1
450 NEXT G
455 PRINT AT G,C;"  ";TAB Y;" "
460 FOR G=0 TO 14
470 PRINT AT G,X+1;"    ";AT G+1
,X;"  ";AT G+2,X;"  "
475 NEXT G
480 PRINT AT 0,7;"
485 PRINT ;AT 2,5;"SCORE 00000"
;AT 2,16-LEN STR$ S;S;AT 21,0;"
486 IF S>H THEN LET H=S
487 PRINT AT 4,5;"HIGH  00000";
AT 4,16-LEN STR$ H;H
490 IF INKEY$="Y" THEN GOTO 3
495 IF INKEY$="N" THEN GOTO 600
496 GOTO 490
500 GOSUB 615
501 FOR J=1 TO 10
502 PRINT AT 20,0;"";AT 20,31;
"";AT 20,0;"";AT 20,31;""
503 NEXT J
510 PRINT AT 20,X-1;"
520 FOR G=18 TO 0 STEP -1
530 PRINT AT G+1,X-1;"
AT G,X;"";AT G,X;"";AT
G,X;"";AT G,X;"
540 NEXT G
550 FOR G=1 TO 5
560 PRINT AT 0,X;"  ";AT 0,X
;"  ";AT 0,X;"  ";AT 0,X;"
  ";AT 0,X;"
570 NEXT G
580 PRINT AT 0,11;"
590 GOTO 485
600 CLS
601 PRINT AT 11,9;"
602 STOP
615 LET X$="
"
```

```
485 PRINT ;AT 2,5;"SCORE 00000"
;AT 2,16-LEN STR$ S;S;AT 21,0;"
     ANOTHER GAME (Y/N)
486 IF S>H THEN LET H=S
487 PRINT AT 4,5;"HIGH  00000";
AT 4,16-LEN STR$ H;H
490 IF INKEY$="Y" THEN GOTO 3
495 IF INKEY$="N" THEN GOTO 600
496 GOTO 490
500 GOSUB 615
501 FOR J=1 TO 10
502 PRINT AT 20,0;"";AT 20,31;
"";AT 20,0;"";AT 20,31;""
503 NEXT J
510 PRINT AT 20,X-1;"
520 FOR G=18 TO 0 STEP -1
530 PRINT AT G+1,X-1;"
AT G,X;"";AT G,X;"";AT
G,X;"";AT G,X;"
540 NEXT G
550 FOR G=1 TO 5
560 PRINT AT 0,X;"  ";AT 0,X
;"  ";AT 0,X;"  ";AT 0,X;"
  ";AT 0,X;"
570 NEXT G
580 PRINT AT 0,11;"YOU LOSE"
590 GOTO 485
600 CLS
601 PRINT AT 11,9;"OK-BYE-BYE"
602 STOP
615 LET X$="
"
620 LET M=32
623 FOR G=LEN X$ TO 1 STEP -1
630 PRINT AT 20,M-1;X$(M)
631 LET M=M-1
635 FOR P=1 TO 1
640 NEXT P
645 NEXT G
650 RETURN
1000 CLS
1010 PRINT AT 0,0;" U . F . O .
";AT 1,0;"";AT 3,0;"
THE OBJECT OF THIS GAME IS TO
TRY TO LAND YOUR MARTIAN SHIP
ON EARTH.HOWEVER,THE GOVERMENT
HAS SEEN YOU COMING,AND IS
BUILDING A HIGH-VOLTAGE POWER
GENERATOR,THE PARTS OF WHICH ARE
CARRIED OVER A BRIDGE ON TANKS.
","THE LONGER YOU CAN DELAY THE
   TANKS,BY BOMBING THEM THROUG
H   THE GAPS IN THE FORCE-FIELD,
THE HIGHER YOUR SCORE WILL BE.WH
EN  ALL THE PARTS HAVE BEEN PLAC
ED  BENEATH THE ARCHES YOU MUST
TRY TO BOMB THE VEHICLE HOLDING
THE POWER SUPPLY TO ENABLE YOU T
O   LAND,OR ELSE YOU ARE DOOMED.
..."
1020 PRINT AT 21,5;"PRESS "C" TO C
ONTINUE"
1030 IF INKEY$<>"C" THEN GOTO 10
30
1040 CLS
1050 PRINT AT 10,11;"""5""LEFT";
AT 11,11;"""8""RIGHT";AT 12,11;"
""0""BOMB";AT 21,5;"PRESS NEWLIN
E TO PLAY"
1060 IF INKEY$<>CHR$ 118 THEN GO
TO 1060
1070 CLS
1080 RETURN
9998 SAVE "UF
9999 RUN
```



KITCHEN CAROUSEL

KNIVES, forks, teacups and other items cross the screen on their journey from the kitchen. Try to score as many points as possible with your limited bullet supply by shooting the objects as they pass. Use keys 5, 8 and 0 to play.

Kitchen Carousel was written for the 48K Spectrum by G Creasey of Ashford, Kent.

```
  10 LET hs=0: LET q=50001: LE
T w=50010: LET e=50068: LET r=50
070
  20 GO TO 80
  30 POKE q,8: LET o=USR w: POKE
 q,9: LET o=USR w: POKE e,5: LET
 o=USR r: POKE e,6: LET o=USR r:
 POKE e,5: LET o=USR r: POKE e,6
: LET o=USR r: POKE e,5: LET o=U
SR r: POKE e,6: LET o=USR r
  40 POKE q,11: LET o=USR w: POK
E q,12: LET o=USR w: POKE q,11:
LET o=USR w: POKE q,12: LET o=US
R w
  50 POKE e,2: LET o=USR r: POKE
 e,3: LET o=USR r: POKE e,2: LET
 o=USR r: POKE e,3: LET o=USR r
  60 POKE e,2: LET o=USR r: POKE
 e,3: LET o=USR r: POKE e,2: LET
 o=USR r: POKE e,3: LET o=USR r
  70 RETURN
  80 BORDER 0: PAPER 0: INK 7: C
LS : PRINT AT 10,9; FLASH 1;"PLE
ASE WAIT"
  90 RESTORE 100: FOR n=50010 TO
 50066: READ a: POKE n,a: NEXT n
: FOR n=50070 TO 50126: READ a:
POKE n,a: NEXT n
 100 DATA 58,81,195,7,7,7,71,62,
175,152,50,81,195,30,8,205,119,1
95,58,81,195,61,50,81,195,29,32,
243,201,22,32,205,137,195,203,30
,35,21,32,250,208,205,137,195,20
3,254,201,58,81,195,71,14,0,205,
170,34,201
 110 DATA 58,148,195,7,7,7,71,62
,175,152,50,148,195,30,8,205,179
,195,58,148,195,61,50,148,195,29
,32,243,201,22,32,205,197,195,20
3,22,43,21,32,250,208,205,197,19
5,203,198,201,58,148,195,71,14,2
55,205,170,34,201
 120 RESTORE 130: FOR n=USR "a"
TO USR "t"+7: READ a: POKE n,a:
NEXT n
 130 DATA 0,0,0,0,0,3,7,15,126,1
26,126,126,126,126,255,255,0,0,0
,0,0,192,224,240,24,60,60,60,126
,126,126,66
 140 DATA 0,2,7,13,27,52,108,20E
,3,7,15,31,62,124,120,48,176,64,
192,0,0,0,0,0
 150 DATA 56,56,40,40,68,68,130,
130,130,130,254,254,254,254,254,
254,126,255,126,255,255,255,195,
247,247,215,199,255,255,251,243,
126
 160 DATA 0,6,3,25,12,102,51,25,
0,0,0,128,192,64,192,128,15,6,0,
0,0,0,0,0,192,224,112,56,28,14,6
,0
 170 DATA 0,0,0,15,9,11,14,14,0,
0,0,240,254,241,113,242,15,15,15
,15,7,112,63,15,212,152,240,240,
224,14,252,240
 180 DATA 255,189,231,129,129,23
1,189,255
 190 CLS : PRINT AT 0,0; PAPER 1
; INK 7; BRIGHT 1;" K I T C H E
N  C A R O U S E L "
 200 PRINT AT 4,0; INK 6;" Shoot
 at the items from the  kitche
n that are crossing the  screen
, trying to score as many points
 as posssible with your  limite
d bullet supply."
 210 INK 5: PRINT '"POINTS:"'' I
NK 3;" E","H"'"FG  - 5 pts","I
  - 10 pts"
 220 INK 4: PRINT '"J","LM"'"K
 - 10 pts","NO  - 15 pts"
 230 INK 5: PRINT '"PQ"'"RS  -
25 pts"
 240 PRINT AT 21,0; INK 7; PAPER
 2;"      PRESS ANY KEY TO PLAY
    ": PAUSE 0: BEEP .05,10:
 250 CLS : PRINT AT 21,0; INK 1;
 PAPER 5;"TTTTTTTTTTTTTTTTTTTTTT
TTTTTTTTTT";AT 0,0; PAPER 2; INK
 7;" SCORE=     HI=     BULLETS=
    "
 260 LET f=0: LET y=12: LET s=0:
 LET b=20: LET c=19
 270 INK 5: PRINT AT 2,0;" PQ
PQ  PQ  PQ  PQ  PQ  PQ RS
RS  RS  RS  RS  RS  RS"
 280 INK 3: PRINT AT 5,0;"  LM
  LM  LM      LM  LM  LM      NO
  NO  NO      NO  NO  NO  "
 290 INK 4: PRINT AT 8,0;" H  J
    J  H     H  J     J  H I  K
    K  I     I  K     K  I"
 300 INK 2: PRINT AT 11,0;"  E
       E  E       E  E      FG
      FG  FG      FG  FG   "
 310 PRINT  PAPER 2; INK 7;AT 0,
7;s;AT 0,15;hs;AT 0,28;b;" "
 320 PRINT  INK 6;AT 20,y;" ABC
"
 330 IF f=1 THEN  PRINT  INK 8;
PAPER 8;AT c,d;" "
 340 IF b=0 THEN  GO TO 530
 350 GO SUB 30
 360 LET y=y+(INKEY$="8" AND y<2
6)-(INKEY$="5" AND y>0)
 370 IF INKEY$="0" AND f=0 THEN
 LET d=y+2: GO SUB 420
 380 IF f=1 THEN  GO SUB 420
 390 IF f=0 THEN  FOR n=0 TO 3:
NEXT n
 400 BEEP .0001,60
 410 GO TO 310
 420 LET f=1: PRINT  INK 8;AT c,
d;"D": LET c1=c: LET c=c-1: IF c
=1 THEN  LET c=19: LET f=0: LET
b=b-1: PRINT AT c1,d;" ": RETURN
 430 IF SCREEN$ (c,d)<>" " THEN
 GO TO 460
 440 INK 8: PRINT AT c1,d;" ";AT
 c,d;"D"
 450 RETURN
 460 LET b=b-1: LET l=ATTR (c,d)
: PRINT AT c1,d;" "
 470 IF l=5 THEN  LET s=s+25
 480 IF l=3 THEN  LET s=s+15
 490 IF l=4 THEN  LET s=s+10
 500 IF l=2 THEN  LET s=s+5
 510 BEEP .005,10
 520 LET c=19: LET f=0: RETURN
 530 FOR n=-20 TO 20 STEP .5: BE
EP .005,n: BEEP .005,n*2: NEXT n
 540 IF s>hs THEN  LET hs=s: PRI
NT AT 1,0; PAPER 1; INK 7; FLASH
 1;"A NEW HIGH SCORE !!!  WELL D
ONE.": FOR n=0 TO 20: BEEP .01,n
: NEXT n
 550 FOR n=1 TO 200: NEXT n: GO
TO 190
```

BIRD WATCHER

REPORTS have been circulating of sightings of the rare Dumb-Dumb bird in north-east Scotland. As a keen bird watcher and expert photographer you have been summoned to take the official pictures. To take a photograph press the key corresponding to the nest in which the bird appears. If you are too slow you will be sacked.

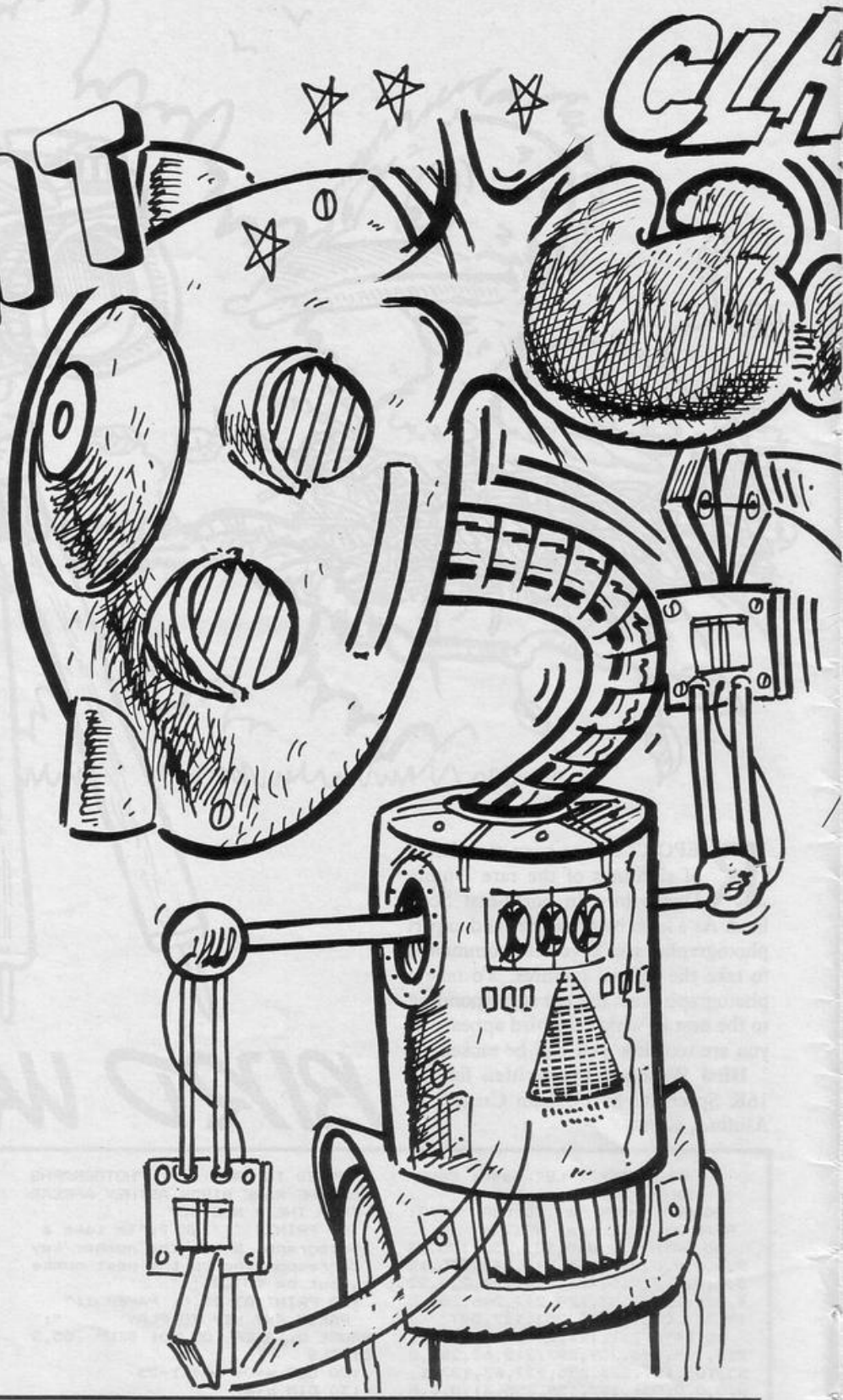
Bird Watcher was written for the 16K Spectrum by Graham Creasey of Ashford, Kent.

```
  10 RANDOMIZE : LET hs=0: PAPER
 0: INK 7: BORDER 0: CLS
  20 FOR n=USR "a" TO USR "t"+7:
 READ a: POKE n,a: NEXT n
  30 DATA 0,0,0,0,127,255,135,23
 9,0,0,0,0,254,255,243,243,255,12
 5,7,7,7,7,7,0,255,190,224,224,22
 4,224,224,0,83,124,247,206,255,2
 19,231,255,37,91,253,127,247
  40 DATA 251,191,219,41,69,187,
 253,119,183,239,247,212,62,253,2
 53,183,187,223,255,127,63,127,1,
 0,0,0,0,231,127,159,255,31,0,0,0
 ,255,191,127,191,248,0,0,0

  50 DATA 126,124,250,144,0,0,0,
 0,0,0,0,0,0,1,7,0,3,7,15,12,61,2
 52,255,31,240,248,248,124,124,12
 4,252,252,0,3,0,0,0,0,0,0,255,7,
 7,1,1,1,1,1,248,248,240,224
  60 DATA 192,192,192,192,1,1,1,
 1,1,15,15,15,192,192,192,192,192
 ,248,248,248
  70 PRINT AT 0,0; PAPER 2;"   B
 I R D     W A T C H E R     "
  80 PRINT AT 3,0; INK 6;" REPO
 RTS HAVE STARTED COMING INOF SIG
 HTINGS OF THE RARE          DUMB-D
 UMB BIRD IN N.E.SCOTLAND."
  90 PRINT '' INK 5;"AS AN EXPER
 T BIRD WATCHER YOU   HAVE BEEN S
 UMMONED TO TAKE      PHOTOGRAPHS
  OF THE RARE BIRDS ASTHEY APPEAR
  FROM THEIR NESTS."
 100 PRINT ''' INK 7;"To take a
 photograph, press the number key
  corresponding to the nest numbe
 r, but be QUICK !!"
 110 PRINT AT 21,0; PAPER 1;"
   PRESS ANY KEY TO PLAY       ":
 PAUSE 0: BEEP .05,20: BEEP .05,3
 0: CLS
 120 LET s=0: LET l=25
 130 DIM b(6)
 140 RESTORE 140: FOR n=1 TO 6:

 READ a: LET b(n)=a: NEXT n: DATA
  3,8,13,18,23,28
 150 FOR n=1 TO 100: NEXT n
 160 PRINT AT 0,0; PAPER 2;"
 SCORE=           HI=          "
 170 PRINT AT 17,0; INK 4; BRIGH
 T 1;"  EFGH EFGH EFGH EFGH EFGH
 EFGH   IJKL IJKL IJKL IJKL IJKL
 IJKL "
 180 PRINT AT 19,0; INK 5;"    1
     2    3    4    5    6   "
 190 PRINT  PAPER 2;AT 0,10;s;AT
 0,23;hs
 200 LET a=INT (RND*6)+1
 210 PRINT  INK 3;AT 14,b(a)-1;"M
 NO";AT 15,b(a)-1;"POR";AT 16,b(
 a)-1;" ST"
 220 FOR n=1 TO 1: IF INKEY$=STR
 $ a THEN  GO TO 250
 230 BEEP .001,40: NEXT n
 240 GO TO 280
 250 PRINT  INK 7;AT 4,b(a);"AB"
 ;AT 5,b(a);"CD"
 260 FOR n=1 TO 50: BEEP .004,n:
  BORDER 2: BORDER 6: BORDER 2: B
 EEP .004,n: BORDER 6: BORDER 2:
 BORDER 6: NEXT n
 270 PRINT AT 4,b(a);"  ";AT 5,b
 (a);"  ";AT 14,b(a)-1;"    ";AT 1
 5,b(a)-1;"    ";AT 16,b(a)-1;"
 ": BEEP .05,20: BORDER 0: LET s=
 s+10: LET l=l-1: FOR n=1 TO 50:
 NEXT n: GO TO 190
 280 FOR n=1 TO 200: NEXT n: BEE
 P .5,-20: PRINT AT 5,0; FLASH 1;
  PAPER 1;"      YOU HAVE BEEN SAC
 KED FOR          BEING TOO SLOW !!
 !!!        "
 290 FOR n=1 TO 200: NEXT n: IF
 s>hs THEN  LET hs=s: PRINT AT 8,
 0;"A NEW HIGH SCORE !": FOR n=0
 TO 20: BEEP .005,n: BEEP .005,-n
 : BEEP .002,(RND*20)+30: NEXT n
 300 PRINT #0; PAPER 2; INK 7;"
  PRESS ANY KEY TO PLAY AGAIN    "
 : PAUSE 0: PAUSE 0: BEEP .05,20:
  BEEP .05,30: CLS : GO TO 70
```

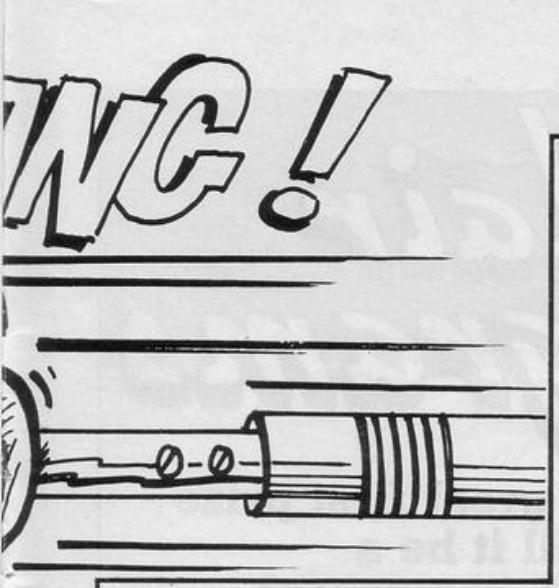
THE FIGHT



A ROBOT ring master referees the fight between you and the computer. You are able to block punches thrown by your opponent and you can also retreat, kick, punch and attack. The keys to use, together with a scoreboard and rows of spectators, are shown on screen.

The Fight was written for the 16K Spectrum by M J Bradford of Heywood, Lancs.

```
  1 CLS
  10 REM ************************
  11 REM ******VARIABLES********
  12 REM ************************
  15 FOR i=0 TO 159: READ x: POK
E USR "a"+i,x: NEXT i
  20 DATA 224,240,224,192,192,22
4,224,224,240,193,255,128,128,12
8,128,192,7,15,7,3,3,7,7,7,15,13
1,255,1,1,1,1,3,224,240,224,192,
193,255,193,192,192,192,192,160,
144,136,136,204,230,244,228,196,
196,252,192,192,103,47,39,35,35,
63,3,3,3,3,5,9,17,17,17,51,7,15,
7,3,131,255,131,3,56,56,56,16,16
,124,84,84
  30 DATA 214,16,16,40,68,68,68,
198,0,0,0,0,64,224,255,255,0,0,0
,0,0,0,129,255,0,0,0,0,2,7,255,2
55,126,66,66,165,129,189,129,126
  35 DATA 7,6,7,7,7,63,47,47,47,
39,35,114,2,2,2,14,224,96,224,22
4,224,252,244,244,244,228,196,78
,64,64,64,112
  36 GO SUB 5000
  40 LET es=0: LET ms=0: BORDER
1: PAPER 7
  50 LET m=17: LET e=14
  60 LET goto=0
3000 REM ************************
3001 REM ******YOUR MOVE********
3002 REM ************************
3010 LET a$="K": LET b$="L": LET
 c$="K": LET d$="L"
3020 PRINT AT 9,m; INK 1;c$
3030 PRINT AT 10,m; INK 1;d$
3100 IF RND>.5 THEN  LET goto=1:
 GO TO 3500
3140 IF INKEY$="" THEN  GO TO 35
00
3150 IF INKEY$<"5" OR INKEY$>"9"
 THEN  GO TO 3500
3200 IF INKEY$<"8" THEN  GO TO 3
300
3210 PRINT AT 9,m;" "
3220 PRINT AT 10,m;" "
3230 LET m=m+(INKEY$="9" AND m<1
9)-(INKEY$="8")
3270 GO TO 3330
3300 IF INKEY$="5" THEN  LET c$=
"H": LET d$="I": BEEP .09,6
3310 IF INKEY$="6" THEN  LET c$=
"J": LET d$="I": BEEP .09,8
3320 IF INKEY$="7" THEN  LET c$=
"C": LET d$="D": BEEP .09,10
3330 PRINT AT 9,m; INK 1;c$
3340 PRINT AT 10,m; INK 1;d$
3360 IF goto=1 THEN  LET goto=0:
 GO TO 3600
3407 REM ************************
3408 REM ******COMPUTERS MOVE***
3409 REM ************************
3500 IF RND<.5 THEN  GO TO 3600
3520 LET z=INT (RND*9)+1
3530 IF z<5 THEN  LET a$="A": LE
T b$="B": BEEP .1,10
3540 IF z>4 AND z<6 THEN  LET a$
="G": LET b$="F": BEEP .1,6
3550 IF z=6 THEN  PRINT AT 9,e;"
 ";AT 10,e;" ": LET e=e+1
3560 IF z=7 THEN  PRINT AT 9,e;"
 ";AT 10,e;" ": LET e=e-1: IF e=
12 THEN  LET e=13
3570 IF z=8 THEN  LET a$="E": LE
T b$="F": BEEP .1,8
3580 IF z=9 THEN  LET a$="K": LE
T b$="L"
3590 PRINT AT 9,e; INK 2;a$
3591 PRINT AT 10,e; INK 2;b$
3592 IF goto=1 THEN  GO TO 3100
3597 REM ************************
3598 REM **WALK INTO EACH OTHER*
3599 REM ************************
```



```
3600 IF e>=m THEN  PRINT AT 9,e;
"  ";AT 10,12; INK 2;" MN"; INK
1;"  NO ": BEEP .5,5: BEEP .5,5:
 BEEP .09,6: BEEP .09,7: BEEP .0
9,6: BEEP .09,5: PRINT AT 10,13;
"      ": GO TO 50
3617 REM ************************
3618 REM *****REF MOVEMENT******
3619 REM ************************
3620 IF RND<.5 THEN  GO TO 3650
3630 PRINT AT 6,13; INK 4;"  QS"
;AT 7,13; INK 4;"  RT"
3640 GO TO 4000
3650 PRINT AT 6,13; INK 4;"QS  "
;AT 7,13; INK 4;"RT  "
4000 REM ************************
4001 REM ******SCORE*************
4002 REM ************************
4010 IF m<>e+1 OR a$="G" THEN  G
O TO 3000
4030 IF a$="K" THEN  GO TO 4100
4040 IF c$<>"K" THEN  GO TO 3000
4050 LET es=es+1
4060 PRINT AT 9,e-1; INK 2;"K  "
;AT 10,e-1; INK 2;"L"; INK 1;"NO
"
4070 BEEP .3,5: BEEP .3,5: BEEP
.09,5: BEEP .09,6: BEEP .09,5: B
EEP .09,4
4080 PRINT AT 9,e-1;" ";AT 10,e-
1;"   "
4090 GO TO 4200
4100 IF c$<>"J" AND d$<>"D" THEN
  GO TO 3000
4110 LET ms=ms+1
4120 PRINT AT 9,e; INK 1;" K";AT
 10,e-1; INK 2;"MN"; INK 1;"L"
4130 BEEP .3,10: BEEP .3,10: BEE
P .09,11: BEEP .09,12: BEEP .09,
10: BEEP .09,13
4140 PRINT AT 9,e+1;" ";AT 10,e-
1;"   "
4200 PRINT AT 1,8;"(ig8)SCORE=";
es;AT 1,17;"SCORE=";ms;"(ig8)"
4500 REM ************************
4501 REM ******WIN or LOSE******
4502 REM ************************
4510 IF ms<9 THEN  GO TO 4550
4515 CLS
4520 FOR i=0 TO 7: FOR o=7 TO 0
STEP -1
4525 BORDER o
4530 PRINT AT 7,3; INK i; "(4*sp
:ig8:4*sp:ig8:3*sp:ig8:sp:ig8:sp
:ig8:3*sp:ig8:13*sp:ig8:sp:ig8:3
*sp:ig8:3*sp:ig8:sp:ig8:sp:2*ig8
:2*sp:ig8:12*sp:ig8:3*sp:ig8:2*s
p:ig8:3*sp:ig8:sp:ig8:sp:ig8:sp:
ig8:sp:ig8:12*sp:5*ig8:2*sp:ig8:
3*sp:ig8:sp:ig8:sp:ig8:2*sp:2*ig
8:12*sp:ig8:3*sp:ig8:2*sp:ig8:sp
:ig8:sp:ig8:sp:ig8:sp:ig8:3*sp:i
g8:12*sp:ig8:3*sp:ig8:2*sp:5*ig8
:sp:ig8:sp:ig8:3*sp:ig8)"
4540 BEEP o/1000,i: NEXT o: NEXT
 i: BEEP .09,15: BEEP .09,15: BE
EP .1,18: CLS : GO SUB 5000: GO
TO 40
4550 IF es<9 THEN  GO TO 50
4560 CLS : PRINT AT 7,0;"THE COM
PUTER (ig8:4*sp:ig8:sp:5*ig8:sp:
ig8:4*sp:ig8:13*sp:ig8:4*sp:ig8:
sp:ig8:3*sp:ig8:sp:2*ig8:3*sp:ig
8:13*sp:ig8:4*sp:ig8:sp:ig8:3*sp
:ig8:sp:ig8:sp:ig8:2*sp:ig8:13*s
p:ig8:4*sp:ig8:sp:ig8:3*sp:ig8:s
p:ig8:2*sp:ig8:sp:ig8:13*sp:ig8:
4*sp:ig8:sp:ig8:3*sp:ig8:sp:ig8:
3*sp:2*ig8:13*sp:ig8:sp:ig8:2*sp
:ig8:sp:ig8:3*sp:ig8:sp:ig8:4*sp
:ig8:13*sp:6*ig8:sp:5*ig8:sp:ig8
:4*sp:ig8)"
4570 BEEP .7,7: BEEP .7,8: BEEP
.7,7: BEEP .6,6: BEEP .6,7: BEEP
 .6,3: BEEP 1.5,-2: CLS : GO TO
40
4997 REM ************************
4998 REM *** FANS,SCORE,ect..***
4999 REM ************************
5000 FOR i=0 TO 16: FOR o=0 TO 9
: PRINT AT i,o; INK 0; PAPER INT
 (RND*5)+2;"P";AT i,o+22;"P": NE
XT o: NEXT i
5001 FOR i=15 TO 16: FOR o=10 TO
 21: PRINT AT i,o; INK 0; PAPER
INT (RND*5)+2;"P": NEXT o: NEXT
i
5010 PRINT AT 1,8;"(ig8)SCORE=0
SCORE=0(ig8)"
5020 FOR i=8 TO 24: PRINT AT 0,i
;"(ig8)";AT 2,i;"(ig8)": NEXT i
5030 PLOT 128,140: DRAW 37,0: DR
AW 0,-75: DRAW -75,0: DRAW 0,75:
 DRAW 38,0
5040 PRINT AT 17,0;"(33*ig8)'5'=
BLOCK(2*ig8)'6'=PUNCH(2*ig8)'7'=
KICK(34*ig8)'8'=LEFT(13*ig8)'9'=
RIGHT(33*ig8)"
5050 RETURN
```

```
   1 LET M=0
   2 FOR N=0 TO 7: READ A: POKE
USR "A"+N,A: NEXT N: DATA 56,56,
146,254,16,124,68,198
   3 LET S=0: LET L=3
   5 BORDER 7: PAPER 7: INK 0: F
OR N=0 TO 21: PRINT AT N,0; FLAS
H 1;"**********STOP THE TAPE*****
*****": NEXT N: PAUSE 50
  10 FOR n=0 TO 21: FOR b=0 TO 3
1: LET i=INT (RND*6)+1: INK i: P
RINT AT n,b;"*": NEXT b: NEXT n
  20 INK 0
  30 BORDER 0
  40 PAUSE 50: FLASH 1: INK 0: P
APER 6: FOR N=0 TO 21: PRINT AT
N,0;"***********HIT STAR********
*****": NEXT N
  50 FLASH 0
  60 PAUSE 100: CLS
  70 PRINT "**********INSTRUCTI
ONS*********"
  80 PRINT : PRINT "YOU HAVE TO
JUMP UP AT THE STAR"'"WHEN IT FL
YS OVER YOUR HEAD"'"IF YOU JUMP
 WHEN THE STAR IS"'"NOT OVER YOUR
 HEAD YOU WILL"'"HIT THE LASER B
EAM AND"'"WILL BE DEAD."'"PRESS
0 TO JUMP"'"PRESS ANY KEY TO STA
RT.": PAUSE 0: CLS
  85 CLS : PRINT "ENTER DIFFICUL
TY 1 TO 9"'"(1=DIFFICULT 9=EASY)
": INPUT P
  87 LET S=0: LET L=3
  89 CLS
  90 FOR X=0 TO 20: INK INT (RND
*4)+1: PRINT AT INT (RND*16)+1,I
NT (RND*31)+1;"*": INK 0: NEXT X
: LET M=0: PRINT AT 0,21;"SCORE=
";S;"*": PLOT 0,40: DRAW 255,0
 100 PLOT 0,0: DRAW 255,0
 111 PLOT 0,40: DRAW 255,0: PLOT
 0,0: DRAW 255,0
 120 PRINT AT 21,16;"A"
 130 FOR R=0 TO 31
 140 PRINT AT 16,R;"*"
 150 PAUSE P: IF INKEY$="0" AND
R=16 THEN  LET S=S+1: IF INKEY$=
"0" AND R=16 THEN  GO TO 5000
 160 IF INKEY$="0" AND R<>16 THE
N  LET M=1: IF INKEY$="0" AND R<
>16 THEN  GO TO 5000
 170 PRINT AT 16,R;" ": PLOT 0,4
0: DRAW 255,0: NEXT R

 180 GO TO 111
5000 FOR N=21 TO 16 STEP -1: PRI
NT AT N,16;"A": BEEP .01,N
5010 PAUSE 5: PRINT AT N,16;" ":
 NEXT N
5015 IF M=1 THEN  PRINT AT 16,16
; INK 2;"A": IF M=1 THEN  GO SUB
 8050
5020 IF M=1 THEN  CLS : IF M=1 T
HEN  GO TO 8000
5030 IF M=0 THEN  LET L=L-1: IF
M=0 THEN  GO SUB 9050: IF M=0 TH
EN  PRINT "HIT STAR*.*.*.*": PAU
SE 50: CLS : GO TO 90
7000 STOP
8000 PRINT "SORRY!!!!!!"'"YOU HI
T THE LASER BEAM"'"YOUR SCORE WA
S ";S;"*": PRINT "PRESS ANY KEY
FOR ANOTHER GAME": PAUSE 0: CLS
: GO TO 85: STOP
8050 BEEP 1,-12: BEEP .6,-12: BE
EP .3,-12: BEEP .9,-12: BEEP .6,
-9: BEEP .3,-10: BEEP .57,-10: B
EEP .3,-12: BEEP .6,-12
8060 BEEP .4,-13: BEEP 1,-12
8070 FOR N=16 TO 21: PRINT AT N,
16;"A": BEEP .01,N: PAUSE 1: PRI
NT AT N,16;" ": NEXT N: RETURN
9000 IF M=1 THEN  LET L=L-1: GO
TO 90
9050 FOR N=16 TO 21: PRINT AT N,
16;"A": PRINT AT N-1,16;"*": BEE
P .01,N: PAUSE 5: PRINT AT N,16;
" ": PRINT AT N-1,16;" ": NEXT N
: CLS : RETURN
9999 PRINT "HIT STAR IS SAVING":
 SAVE "HIT STAR" LINE 1
```

HEAD FOR THE STARS

WAIT until a star is above your head and then jump at it. If you hit the beam instead of the star you will lose the game. See how many stars you can hit before you knock your head on the beam.

Head for the Stars was written for the 16K Spectrum by Emlyn Howell, aged 9, of Brighton, Sussex.

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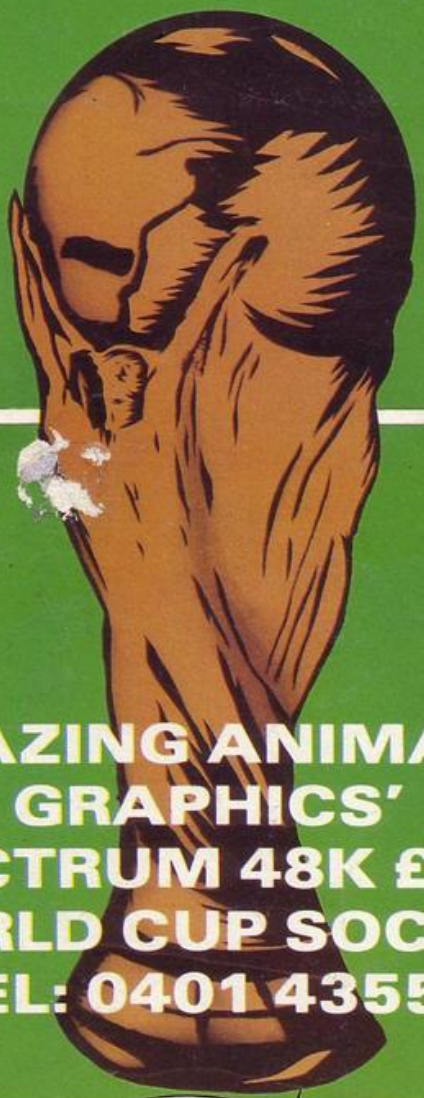

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