

TOP
LISTINGS
FOR THE
SPECTRUM AND ZX-81

August 1984

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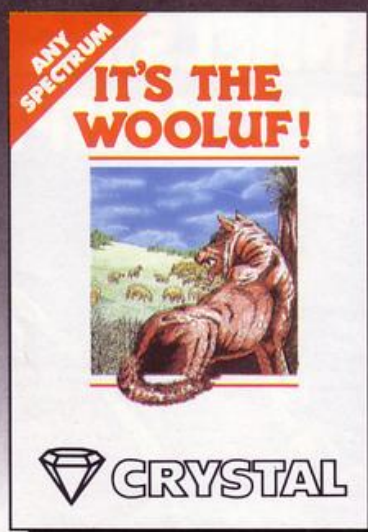
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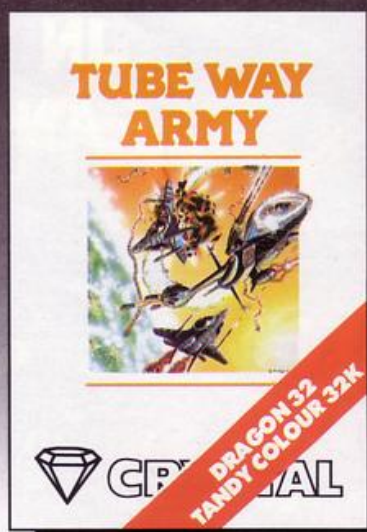
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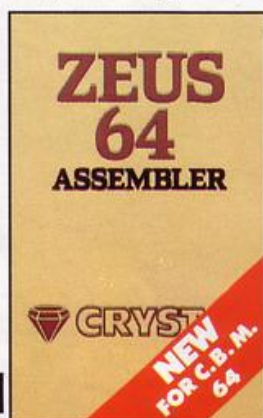
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Simon Brattel and
Martin Horsley



INVASION OF THE BODY SNATCHAS

Written by: Simon Brattel
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Contents

GRAPHICS	3
INSTRUCTIONS	
LETTERS	31

SOFT THEME	32
PROGRAM TUTOR	34
SOFT FOCUS	36

Zx81

ARMADA	9
FLOOD BARRIER	18
LOCUST ATTACK	20
RUNWAY	26
PASTA BLASTA	27
FISHERMAN	30

VANHELISING AND THE VAMPIRES	39
SEA RESCUE	43
HOLD-UP	49
GUESS WHAT	62
ANIMATION	63
COSMIC DUSTMAN	64

Beginners

SPECTRUM	
TENNIS ANIMATION	15
MANIC AXE	15
JAM SEARCH	17
SHIP WRECK	17

ZX-81	
EQUATIONS OF MOTION	16
PLUTONIUM	16

Spectrum

PROGRAM OF THE MONTH	
COLOUR THE PYRAMID	5
ANSWER THE PHONE	10
MUTANT ARACHNID	14
ALPHABETICAL ATTACK	23
GHOST MONSTER	42

ICABOD THE EVIL FROG	46
BOUNCING BALL	48
ROLL A BALL	51
MPG	52
ICEBERG	55
MOLE ATTACK	59
CAVERN BLASTER	60

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.

A black and white photograph of a SPRINT Challenge Research device. The device is a small, dark, rectangular electronic unit with a screen and buttons. The screen displays the word "SPRINT" in large, bold letters, with "Challenge Research" written below it. Above the screen, the text "AUTO STOP" is visible. The device is shown from a slightly elevated angle, highlighting its compact design.

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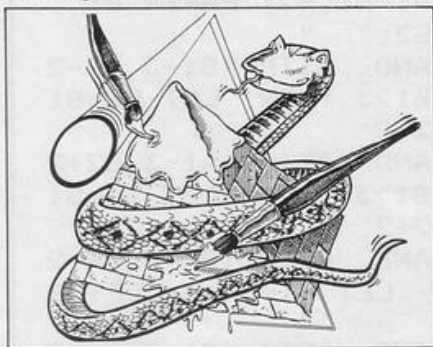
4

COLOUR THE PYRAMID



THERE IS a myth that all good programs are long and complicated. For those who write programs in a hurry that may be true but if you think about the program first, you can have results such as **Colour the Pyramid**. It is based on the popular game Q*BERT. The graphics are superb and it is worth the effort to type-in.

In this version, you play the part of a little man who must jump from square to square on a 3D pyramid, colouring the pyramid blocks as you go. You can move up and down but all movement is



diagonal. To move in the game the A, Z, K and M keys are used.

When you jump on to a square, it will be filled with the colour shown on the top left of the screen. After the whole pyramid has been filled-in, you move to the next sheet, where it is necessary to jump on the squares twice for them to be coloured correctly.

Colour The Pyramid was written for the 48K Spectrum by Simon Baines of Felixstowe, Suffolk. He took approximately five hours to write it and has owned a Spectrum for a year, having previously had a ZX-81 for six months.

The POKE in line 5 ensures that the response to the request for instructions is in upper-case. If instructions are required, the routine at line 3000 prints them. Line 3050 waits for the player to press a key as well as playing a note.

The routine at line 6 initialises the score counters and prints a string of zeros for score and high score. The reason is that the scores will be printed over the zeros, thus giving a neat effect. Lines 40 to 60 draw the pyramid and those lines contain two conditional loops. Line 40 prints each block of the pyramid. After that, the discs are drawn at line 70 and the starting positions for the ball and snake are at lines 101-102.

The main routine of the program, one large loop at lines 120-390, follows. There several operations are performed. First, a test is made to see if the user is moving the man — line 130. If not, a jump is made to the movement routines for the ball and snake; remember, the ball and snake can move even if you do not.

If you have decided to move, lines 140-165 test to see which way you will move. Immediately after that, two tests have to be made. First, a check in line 171 is made to see if you have fallen from the pyramid; if so, the line also contains a loop to draw the man falling. Next, a test is made to see if the block to which you are about to jump is not coloured; if that is so, it is coloured at line 180.

The remaining major action of this routine is to find your position and alter the direction of the snake and ball, to a limited extent; it is done at lines 280-

310.

Last, the main routine can also call a jump to other routines — listed. They perform tasks such as start new game, move to next sheet, and so on.

Main routines

2-5	Instruction prompt.
6-35	Initialise scores.
40	Print pyramid block.
50-102	Draw pyramid and initialise movement variables.
120-390	Main routine — see text.
400-440	Caught routine.
1000-1010	Completed pyramid.
2000-2050	Move disc.
3000-3060	Print instructions.
4000-4002	Save game routine — use after written.
9900-9916	User-definable graphics data.
9900-9999	Wait message and read data.

Pokes used

FLAGS2 (23658) Ensures upper-case input.
Line 9990 Pokes data into UDG area.

Strings used

A\$ used for all user input.

Variables used

FI	Holds current number of blocks filled.
HI	High score.
SC	Holds current score.
LIV	Number of lives.
SH	Holds current sheet — round — number.
X	Line position of block.
Y	Character position of block.
F	Used as index for last-row drawing.
B1	Line position of ball.
B2	Column position of ball.
S1	Line position of snake.
S2	Column position of snake.
A	Line position of man.
B	Column position of man.
D	Holds — random — movement pointer for ball and snake.
IK	Holds current ink number of block.
L, M and T	Indices used when drawing pyramid.

```

1 GO TO 9900
2 CLS
4 PRINT AT 7,12; INK 6;"(ig4
:6*g3:g7)"; AT 8,12;"(ig5)"; INK
2;"Q*BERT"; INK 6;"(g5)"; AT 9,
12;"(ig1:6*ig3:ig2)"
5 POKE 23658,8: LET HI=0: PRI
NT AT 11,2;"WOULD YOU LIKE INST
RUCTIONS?": INPUT LINE A$: IF A
$="Y" THEN GO SUB 3000
6 RANDOMIZE

```

```

10 OVER 1: BORDER 0: PAPER 0:
INK 7: BRIGHT 1: CLS
15 LET SC=0: LET LIV=3: LET SH
=1
20 PRINT AT 0,0;"SC:000000";
AT 0,20;"HI:000000"; AT 1,0;"SHE
ET:1"; AT 1,20;"LIVES:3"
22 PRINT AT 3,0; INK 4;"AB";
AT 4,0;"BA"
23 IF SH>1 THEN PRINT AT 3,0

```

continued on page 6


```
; OVER 0; INK 5; "AB"; AT 4,0; "BA"
; AT 5,0; INK 4; "AB"; AT 6,0; "B
A"
```

```
30 OVER 1: PRINT AT 0,29- LEN
STR$ HI; OVER 0; HI; AT 0,9- LE
N STR$ SC; OVER 0; SC; AT 1,26; L
IV; AT 1,0; "SHEET:"; SH
```

```
35 LET X=-2: LET Y=15: LET C=1
: LET L=-2: LET M=15: GO TO 50
```

```
40 INK 6: PRINT AT X+2,Y+1; "A
B"; AT X+3,Y; "A"; PAPER 6; " ";
PAPER 0; "B"; AT X+4,Y; "B"; PAPER
6; " "; PAPER 0; "A"; AT X+4,Y; "
C"; AT X+4,Y+3; "D"; AT X+5,Y+1; "
BA"; AT X+6,Y+1; "D": INK 7: RETU
RN
```

```
50 LET T=7: LET C=1
```

```
55 GO SUB 40: LET X=X+3: LET Y
=Y-2: LET C=C+1: IF C<T THEN GO
TO 55
```

```
60 LET L=L+3: LET M=M+2: LET T
=T-1: LET C=1: LET X=L: LET Y=M:
IF T>1 THEN GO TO 55
```

```
61 INK 6: PLOT 40,32: FOR F=1
TO 6: DRAW OVER 0;16,-16: DRAW
OVER 0;16,16: NEXT F: INK 7
```

```
70 PRINT AT 8,8; BRIGHT 0; "IJ
"; AT 9,8; "KL"; AT 8,24; "IJ"; AT
9,24; "KL"
```

```
100 OVER 0: LET A=7: LET B=12:
LET FI=0
```

```
101 LET B1=1: LET B2=16
```

```
102 LET S1=7: LET S2=20
```

```
120 PRINT AT A,B; PAPER 8; INK
8; " "; AT A+1,B; " "
```

```
130 LET A$= INKEY$: IF A$ <> "
A" AND A$ <> "Z" AND A$ <> "K" A
ND A$ <> "M" THEN GO TO 191
```

```
140 IF A$="Z" THEN LET A=A+3:
LET B=B+2
```

```
150 IF A$="M" THEN LET A=A+3:
LET B=B-2
```

```
160 IF A$="A" THEN LET A=A-3:
LET B=B-2
```

```
165 IF A$="K" THEN LET A=A-3:
LET B=B+2
```

```
170 IF ATTR (A+2,B)=7 THEN GO
TO 2000
```

```
171 IF ATTR (A+2,B)=71 THEN O
VER 1: FOR F=A TO 20 STEP 3: FOR
G=1 TO 2: PRINT AT F,B; PAPER
8; INK 8; "EF"; AT F+1,B; "GH": NE
XT G: BEEP .01,20-F: NEXT F: OVE
R 0: GO TO 410
```

```
172 IF ATTR (A+2,B)=68 THEN G
O TO 181
```

```
173 LET IK=4: IF SH>1 AND ATTR
(A+2,B)=70 THEN LET IK=5
```

```
174 IF SH>1 AND ATTR (A+2,B)=6
9 THEN LET IK=4
```

```
180 IF ATTR (A+2,B) <> 71 THEN
PRINT AT A-1,B; INK IK; "AB";
```

```
AT A,B-1; "A"; PAPER IK; " "; PAP
ER 0; OVER 1; " "; OVER 0; AT A+1
,B-1; "B"; PAPER IK; " "; PAPER 0
; "A"; AT A+2,B; "BA": OVER 1: PRI
NT AT A+1,B-1; INK 8; PAPER 8; "
C D": OVER 0: LET FI=FI+(1 AND
IK=4): LET SC=SC+1: PRINT AT 0,
9- LEN STR$ SC; OVER 0; SC
185 IF FI=21 THEN GO TO 1000
```

```
190 BEEP .01,-20
```

```
191 IF A=S1 AND B=S2 OR A=B1 AN
D B=B2 THEN GO TO 400
```

```
200 PRINT AT A,B; PAPER 8; INK
1; "EF"; AT A+1,B; "GH"
```

```
220 PRINT AT B1,B2; PAPER 8; "
"; AT B1+1,B2; " ": LET B1=B1+3
```

```
: LET D= INT ( RND *2)+1: LET B2
=B2+2*(D=1)-2*(D=2): IF SH>2 AND
RND >.5 AND B1>4 AND ATTR (B1
-6,B2) <> 71 THEN LET B1=B1-6
```

```
231 IF B1=19 THEN LET C=0: LET
B1=1: LET B2=16
```

```
240 PRINT AT B1,B2; INK 2; PAP
ER 8; "IJ"; AT B1+1,B2; "KL"
```

```
260 LET D= INT ( RND *4)+1
```

```
270 PRINT AT S1,S2; PAPER 8; "
"; AT S1+1,S2; " "
```

```
280 IF D=1 AND ATTR (S1-3,S2-2
) <> 71 AND S1>3 THEN LET S1=S1
-3: LET S2=S2-2
```

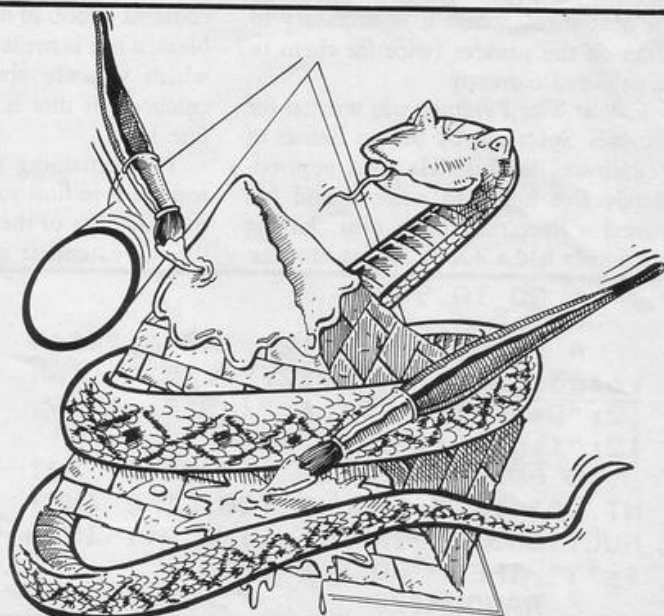
```
290 IF D=2 AND ATTR (S1-3,S2+2
) <> 71 AND S1>3 THEN LET S1=S1
-3: LET S2=S2+2
```

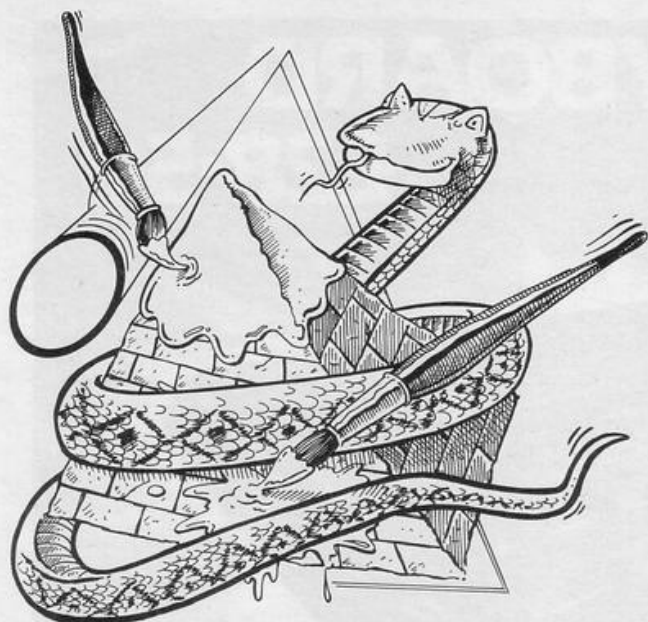
```
300 IF D=3 AND ATTR (S1+3,S2+2
) <> 71 THEN LET S1=S1+3: LET S
2=S2+2
```

```
310 IF D=4 AND ATTR (S1+3,S2-2
) <> 71 THEN LET S1=S1+3: LET S
2=S2-2
```

```
320 IF S1=A AND S2=B THEN GO T
O 400
```

```
321 IF S1<1 THEN LET S1=1
```





```

330 PRINT AT S1,S2; PAPER 8; I
NK 3; "MN"; AT S1+1,S2; "OP"
340 IF ATTR (A,B)=114 OR ATTR
(A,B)=115 THEN GO TO 400
390 GO TO 120
400 PRINT AT A,B; INK 1; PAPER
8; "EF"; AT A+1,B; "GH"; AT A-1,B
+1; FLASH 1; INK 6; "!###": FOR F
=1 TO 15: BEEP .01,F: BEEP .01,7
: BEEP .01,15-F: NEXT F
410 LET LIV=LIV-1: PRINT AT 1,
20; OVER 0; "LIVES:"; LIV: FOR F=1
TO 150: NEXT F: IF LIV>0 THEN
CLS : GO TO 20

```

```

420 FOR F=1 TO 50: BEEP .01, RN
D *50-20: NEXT F: PRINT AT 21,2
; "PRESS ANY KEY TO PLAY AGAIN."

```

```

430 IF INKEY$="" THEN GO TO
430
435 IF SC>HI THEN LET HI=SC
440 GO TO 6

```

```

1000 LET SH=SH+1: IF SH/6= INT (
SH/6) THEN LET LIV=LIV+1
1010 LET SC=SC+100: FOR F=1 TO 4
0: BEEP .01,F: NEXT F: CLS : GO
TO 20

```

```

2000 PRINT AT A,B; " "; AT A+1,
B; " "; AT A+2,B; " ": LET B=B-4
*(B<16)+4*(B>16)
2005 LET A=A-1: LET B=B+(B<16)-(
B>16): BEEP .01,A: PRINT AT A,B
-1; INK 1; "EF"; AT A+1,B-1; "G
H"; AT A+2,B-1; INK 7; "KL"; A
T A+3,B-1; " "

```

```

2010 IF A>0 THEN GO TO 2005
2015 PRINT AT A,B; " "; AT A+1,
B; " "; AT A+2,B; " ": LET A=1:
LET B=16
2025 PRINT AT 0,0; "SC:000000";
AT 0,20; "HI:000000"; AT 1,0; "SHE

```

```

ET:1"; AT 1,20; "LIVES:3"
2026 PRINT AT 0,29- LEN STR$ H
I; OVER 0; HI; AT 0,9- LEN STR$
SC; OVER 0; SC; AT 1,26; LIV; AT 1
,0; "SHEET:"; SH
2030 GO TO 200
2050 STOP
3000 CLS : PRINT AT 0,13; "Q*BER
T"; AT 1,13; INK 3; "(6*g3)"
3010 PRINT " " CONTROLS:-"
3020 PRINT AT 3,14; "A K"; AT 4
,15; "\/"; AT 5,15; "/\"; AT 6,14;
"M Z"
3030 PRINT " " JUMP ON THE BLOC
KS TO CHANGE THEIR COLOUR.AVO
ID THE SNAKE AND BOUNCING BA
LL. ON LATER SCREENS JUMP ON
EACH BLOCK TWICE.JUMPING ON
A DISC WILL FLY YOU TO THE
TOP OF THE PYRAMID.ON THE
THIRD SCREEN THE BALL WILL
BOUNCE UPWARDS"

```

```

3040 PRINT INK 2; AT 19,8; "PRÉS
S ANY KEY."

```

```

3050 IF INKEY$="" THEN BEEP .
01, RND *50-20: GO TO 3050

```

```

3060 CLS : RETURN

```

```

4000 SAVE "Q*BERT" LINE 1

```

```

4001 VERIFY "Q*BERT"

```

```

4002 RUN

```

```

9900 DATA 1,3,7,15,31,63,127,255
,128,192,224,240,248,252,254,255

```

```

9901 DATA 128,128,128,128,128,12
8,128,128

```

```

9902 DATA 1,1,1,1,1,1,1,1

```

```

9903 DATA 7,15,27,17,49,49,59,62
,192,224,176,24,24,24,184,248,60
,24,25,15,7,4,4,29,112,240,224,1
92,192,64,64,192

```

```

9907 DATA 0,7,31,63,63,127,127,1
27,0,224,248,252,252,254,254,254

```

```

9908 DATA 127,127,127,63,63,31,7
,0,254,254,254,252,252,248,224,0

```

```

9909 DATA 0,0,60,78,126,60,12,6

```

```

9910 DATA 0,0,0,0,24,102,102,198

```

```

9911 DATA 6,6,1,0,0,0,0,0

```

```

9912 DATA 195,195,195,0,0,0,0,0

```

```

9915 DATA 1,3,7,15,15,7,3,1

```

```

9916 DATA 128,192,224,240,240,22
4,192,128

```

```

9990 PRINT AT 10,10; FLASH 1; "P
LEASE WAIT": RESTORE 9900: FOR f
= USR "a" TO USR "P"+7: READ a:
POKE f,a: NEXT f
9999 GO TO 2

```


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The computer then draws a path from the star at the bottom to one of the letters at the top by going along any rung until it reaches the end. The letter at which it finishes is the winner.

ARMIDA

```

118 FOR G=2 TO 20 STEP 2
119 INPUT I
120 IF I=1 THEN LET A$(G)=B$
121 IF I=2 THEN PRINT AT G,0;B$
122 IF I=2 THEN LET A$(G)=C$
123 IF I=2 THEN PRINT AT G,0;C$
124 IF I=3 THEN LET A$(G)=D$
125 IF I=3 THEN PRINT AT G,0;D$
126 IF I=4 THEN LET A$(G)=E$
127 IF I=4 THEN PRINT AT G,0;E$
128 IF I=5 THEN LET A$(G)=F$
129 IF I=5 THEN PRINT AT G,0;F$
130 IF I=6 THEN LET A$(G)=G$
131 IF I=6 THEN PRINT AT G,0;G$
132 IF I=7 THEN LET A$(G)=H$
133 IF I=7 THEN PRINT AT G,0;H$
134 NEXT G
135 CLS
136 PRINT X$
137 FOR K=1 TO 20
138 PRINT A$(K)
139 NEXT K
140 PRINT AT 21,4;"*"
141 PRINT AT 10,10;"WAIT AND I
WILL TELL"
142 PRINT AT 11,10;"YOU WHO WON

```

```

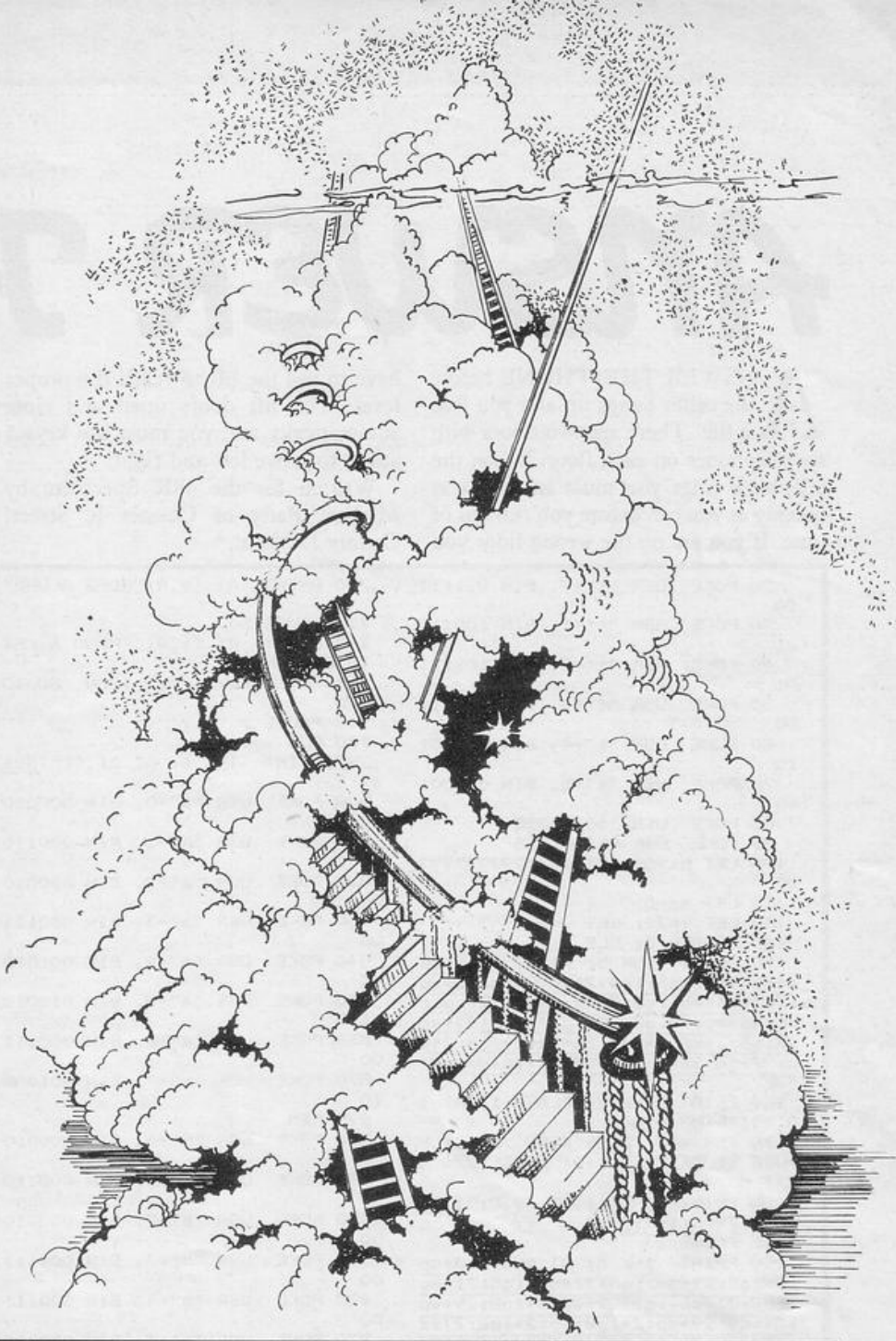
0020 NEXT A
0030 PRINT AT 11,11;Z$;" WON."
0040 FOR D=1 TO 100
0050 NEXT D
0060 CLS
0070 PRINT "WOULD YOU LIKE ANOTH
0080 GAME?"
0090 LET M$=INKEY$
0100 IF M$="Y" THEN RUN
0110 IF M$="N" THEN STOP
0120 GOTO 2550
0130 REM A
0140 IF Y(1)=0 THEN GOTO 2200
0150 IF A$(Y)=0 THEN LET Z$="B"
0160 IF A$(Y)=0 THEN LET Z$="C"

```

```

ETTER,AT THE TOP, WHICH IT REA
CHES IS THE WINNER."
8090 PRINT AT 21,0;"PRESS ANY KE
Y TO CONTINUE."
8100 IF INKEY$="" THEN GOTO 8100
8110 CLS
8120 PRINT AT 2,13;"ARMID?"
8130 PRINT AT 4,0;"THE GAME CAN
BE PLAYED BY 1,2 OR 4 PLAYERS. IF
THERE IS ONE PLAYER, THEN C
HOOS THE POLE, WHICH YOU TH
NK WILL WIN. IF THERE ARE
2 PLAYERS, THEN ONE TAKES PO
LE A AND B AND THE OTHER C AND
WHO THE WINNER IS, DEPENDS ON WH
ICHEVER LETTER IT FINISHES ON.
8140 PRINT AT 13,0;" IF THERE A
RE 4 PLAYERS, ONE PLAYER TAKES
EACH POLE, THE WINNER IS TH
E PLAYER WHOSE LETTER IT FI
NISHES ON."
8200 PRINT AT 21,0;"PRESS ANY KE
Y TO START."
8250 IF INKEY$="" THEN GOTO 8250
8300 CLS
8500 RETURN
8999 DIM B$(7)
9000 DIM C$(7)
9001 DIM D$(7)
9002 DIM E$(7)
9003 DIM F$(7)
9004 DIM G$(7)
9005 DIM H$(7)
9006 LET B$=""
9007 LET C$=""
9008 LET D$=""
9009 LET E$=""
9010 LET F$=""
9011 LET G$=""
9012 LET H$=""
9097 RETURN
9998 SAVE "ARMID?"
9999 DIM

```



ANSWER THE 'PHONE

ANSWER THE 'PHONE before the caller hangs up and you lose a life. There are two floors with six telephones on each floor. When the telephone rings you must answer it as quickly as you can before you run out of time. If you are on the wrong floor you

have to use the lift to reach the proper level. The lift doors open and close automatically and you must use keys 5 and 8 to move left and right.

Written for the 48K Spectrum by Michael Batty of Chester le Street, County Durham.

```

20 POKE USR "t"+0, BIN 011111
10
30 POKE USR "t"+1, BIN 100110
01
40 POKE USR "t"+2, BIN 101111
01
50 POKE USR "t"+3, BIN 001111
00
60 POKE USR "t"+4, BIN 011001
10
70 POKE USR "t"+5, BIN 011001
10
80 POKE USR "t"+6,255
90 POKE USR "t"+7,255
100 LET hs=0: LET a$="?????????"
?"
110 LET sc=0
130 LET x=20: LET y=1
140 BORDER 0: CLS
150 PRINT INK 5; AT 12,12;"(sp
:6*ig8:25*sp:ig8:2*sp:2*ig8:2*sp
:ig8:24*sp:ig8:2*sp:2*ig8:2*sp:i
g8:26*sp:4*ig8:28*sp:4*ig8:27*sp
:21g8:2*sp:2*ig8:26*sp:2*ig8:2*s
p:2*ig8:25*sp:8*ig8:24*sp:8*ig8)
"
160 PRINT INK 2; FLASH 1; AT 1
0,12;"RING RING"
170 FOR n=0 TO 2: BEEP .5,10: P
AUSE 5: BEEP .55,10: PAUSE 27: N
EXT n
180 PRINT INK 1; AT 10,0;"(15*
ig8:17*sp:15*ig8)"
185 PAUSE 23
190 PRINT INK 5; AT 0,0;"(3*sp
:2*ig8:29*sp:ig8:31*sp:ig8:31*sp
:ig8:31*sp:ig8:29*sp:3*ig8:29*sp
:3*ig8:29*sp:2*ig8:sp:2*ig8:27*s
p:2*ig8:30*sp:2*ig8:30*sp:2*ig8:
30*sp:2*ig8:28*sp)"
200 PRINT INK 5; AT 12,12;"(35
*sp:2*ig8:30*sp:2*ig8:8*sp)"
210 PAUSE 5
580 BEEP .1,13
590 PRINT AT 6,6;"Press a key
to continue"
600 BEEP .3,5
610 IF INKEY$ ="c" THEN GO TO
630
620 PAUSE 0
630 CLS
635 BORDER 1
640 PRINT AT 1,0;"PRESS ""5""
TO GO LEFT"
650 PRINT AT 3,0;"PRESS ""8""
TO GO RIGHT"
660 PRINT AT 5,0;"-----"
"
670 PRINT AT 7,0;"PRESS ""1""
TO OPEN LIFT DOOR"
680 PRINT AT 9,0;"FOR EACH CAL
L YOU ANSWER YOU GET"
690 PRINT AT 11,0;"5 POINTS"
"
700 PRINT AT 13,0;"THE GAME IS
OVER WHEN YOU LOSE"
710 PRINT AT 15,0;"THREE LIVES
"
720 PRINT AT 17,0;"THE GAME GE
TS HARDER AS IT "

```

```

730 PRINT AT 19,0;"GOES ALONG"
"
735 PAUSE 50
740 PRINT AT 21,0;"PRESS A KEY
TO CONTINUE"
750 IF INKEY$ ="c" THEN GO TO
770
760 PAUSE 0
770 CLS
780 PRINT INK 6; AT 21,0;"(32*
g3)"
800 POKE USR "a"+0, BIN 000010
00
810 POKE USR "a"+1, BIN 000110
00
820 POKE USR "a"+2, BIN 000010
00
830 POKE USR "a"+3, BIN 000111
00
840 POKE USR "a"+4, BIN 001010
10
850 POKE USR "a"+5, BIN 010010
01
860 POKE USR "a"+6, BIN 000111
00
870 POKE USR "a"+7, BIN 001000
10
875 REM
880 POKE USR "b"+0, BIN 000010
00
890 POKE USR "b"+1, BIN 000110
00
900 POKE USR "b"+2, BIN 000010
00
910 POKE USR "b"+3, BIN 000111
00
920 POKE USR "b"+4, BIN 000111
00
930 POKE USR "b"+5, BIN 000010
00
940 POKE USR "b"+6, BIN 000101
00
950 POKE USR "b"+7, BIN 000101
00
960 REM
970 POKE USR "c"+0, BIN 000100
00
980 POKE USR "c"+1, BIN 000110
00
990 POKE USR "c"+2, BIN 000100
00
1000 POKE USR "c"+3, BIN 001110
00
1010 POKE USR "c"+4, BIN 010101
00
1020 POKE USR "c"+5, BIN 100100
10
1030 POKE USR "c"+6, BIN 001110
00
1040 POKE USR "c"+7, BIN 010001
00
1050 REM
1060 POKE USR "d"+0, BIN 000100
00
1070 POKE USR "d"+1, BIN 000110
00
1080 POKE USR "d"+2, BIN 000100
00
1090 POKE USR "d"+3, BIN 001110
00

```

```

1100 POKE USR "d"+4, BIN 001110
00
1110 POKE USR "d"+5, BIN 000100
00
1120 POKE USR "d"+6, BIN 001010
00
1130 POKE USR "d"+7, BIN 001010
00
1131 LET l=3
1140 PRINT AT 0,0;"SCORE-";sc;"
HI-";hs;" LIVES-";l
1150 PRINT INK 6; AT 12,0;"(24*
g3)"
1160 PRINT INK 5; AT 10,0;"I
T T T T T"
1170 PRINT INK 6; OVER 1; AT 10
,25;"(7*ig8:26*sp:ig5:4*sp:g5:26
*sp:ig5:4*sp:g5:26*sp:ig5:4*sp:g
5:26*sp:ig5:4*sp:g5:26*sp:ig5:4*
sp:g5:26*sp:ig5:4*sp:g5:26*sp:ig
5:4*sp:g5:26*sp:ig5:4*sp:g5:26*s
p:ig5:4*sp:g5:26*sp:ig5:4*sp:g5:
24*sp)"
1180 PRINT INK 6; AT 12,24; OVE
R 1;"(ig8:31*sp:ig8:31*sp:ig8:31
*sp:ig8:31*sp:ig8:31*sp:ig8:31*s
p:ig8:31*sp:ig8:sp)"
1190 POKE USR "e",255
1195 PRINT INK 5; AT 19,0;"I

```





```

T T T T T
1200 POKE USR "e"+1,129
1210 POKE USR "e"+2,1
1220 POKE USR "e"+3,1
1230 POKE USR "e"+4,1
1240 POKE USR "e"+5,1
1250 POKE USR "e"+6,129
1260 POKE USR "e"+7,255
1270 POKE USR "f",255: POKE US
R "f"+7,255
1280 FOR n=1 TO 6
1290 POKE USR "f"+n,129
1300 NEXT n
1301 LET q=20: LET z=25
1310 PRINT AT q,z;"F"
1320 LET w=30
1335 PRINT AT x,y;"A"
1350 LET p= INT ( RND *12)+1
1352 IF p=1 THEN LET g=9: LET h
=0
1353 GO SUB 2000
1354 IF p=2 THEN LET g=9: LET h
=4
1355 GO SUB 2000
1356 IF p=3 THEN LET g=9: LET h
=8
1357 IF p=4 THEN LET g=9: LET h
=12
1358 GO SUB 2000

```

```

1359 IF p=5 THEN LET g=9: LET h
=16
1360 GO SUB 2000
1361 IF p=6 THEN LET g=9: LET h
=20
1362 GO SUB 2000
1363 IF p=7 THEN LET g=18: LET
h=0
1364 GO SUB 2000
1365 IF p=8 THEN LET g=18: LET
h=4
1366 GO SUB 2000
1367 IF p=9 THEN LET g=18: LET
h=8
1368 GO SUB 2000
1369 IF p=10 THEN LET g=18: LET
h=12
1370 GO SUB 2000
1371 IF p=11 THEN LET g=18: LET
h=16
1372 GO SUB 2000
1373 IF p=12 THEN LET g=18: LET
h=20
1374 GO SUB 2000
1380 PRINT AT g,h; INK 2; FLASH
1;"!": LET w=w-1
1400 GO SUB 2000
1405 IF w=0 THEN LET l=1-1: BEE
P .5,0: GO SUB 7000

```

```

1410 IF l=0 THEN GO TO 9000
1420 GO TO 1380
2000 IF INKEY$ ="5" THEN GO SU
B 3000
2010 IF INKEY$ ="8" THEN GO SU
B 4000
2020 IF INKEY$ ="1" THEN GO SU
B 5000
2030 RETURN
3000 LET y=y-1
3001 IF y=-1 THEN LET y=0
3002 PRINT AT x,y;"A": AT x,y;"
B"
3003 PRINT AT x,y+1;" ": IF x-2
=g AND y=h THEN LET sc=sc+5: PR
INT AT x,y;" ": BEEP .1,20: GO
SUB 7000
3004 PRINT AT x,y+1;" "
3005 RETURN
4000 LET y=y+1
4001 IF y=25 THEN PRINT AT x,y
;" ": GO SUB 6000
4002 PRINT AT x,y;"C": AT x,y;"
D"
4003 IF x-2=g AND y=h THEN PRIN
T AT x,y-1;" ": LET sc=sc+5: BE
EP .1,20: GO SUB 7000
4005 PRINT AT x,y-1;" "
4006 RETURN
5000 PRINT AT q,z;"E"
5001 RETURN
6000 REM
6001 IF x=20 THEN PRINT AT 20,
24;" ": FOR n=20 TO 11 STEP -1:
PRINT AT n,25;"B": PRINT OVER
1: AT n,25;"E": PAUSE 5: PRINT
AT n,25;" ": NEXT n: LET x=11: P
RINT AT 11,25;"E": PRINT AT 11
,24;"A": LET y=24: GO TO 6003
6002 IF x=11 THEN PRINT AT 11,
24;" ": FOR n=11 TO 20: PRINT A
T n,25;"E": PRINT OVER 1: AT n,
25;"B": PAUSE 5: PRINT AT n,25;
" ": NEXT n: LET x=20: PRINT AT
20,25;"E": PRINT AT 20,24;"A":
LET y=24
6003 LET y=24
6004 RETURN
7000 PRINT AT 0,0;"SCORE-";sc;"
HI-";hs;" LIVES-";l
7001 LET w=120
7002 IF sc>100 THEN LET w=w-10
7003 IF sc>200 THEN LET w=w-10
7004 IF sc>300 THEN LET w=w-10
7005 IF sc>400 THEN LET w=w-10
7006 IF sc>500 THEN LET w=w-10
7007 IF sc>1000 THEN LET w=w-15
7008 IF sc>2000 THEN LET w=w-10
7009 IF sc>3000 THEN LET w=w-10
7010 IF sc>10000 THEN LET w=w-2
0
7050 PRINT AT g,h;" "
7100 GO TO 1320
9000 FOR n=30 TO -20 STEP -2.5
9001 BEEP .1,n: NEXT n
9002 CLS
9003 IF sc>hs THEN PRINT "You h
ave The High score": BEEP .5,32:
LET hs=sc: INPUT "NAME";a$
9004 CLS : PRINT "THE HIGH SCORE
-";hs: PRINT : PRINT "THE HIGH S
CORER - ";a$: PRINT : PRINT "YOU
R SCORE WAS ";sc
9005 PRINT "PRESS A KEY FOR ANOT
HER GAME"
9006 IF INKEY$ ="c" THEN GO TO
9999
9007 PAUSE 0
9999 LET sc=0: LET w=120: GO TO
770

```


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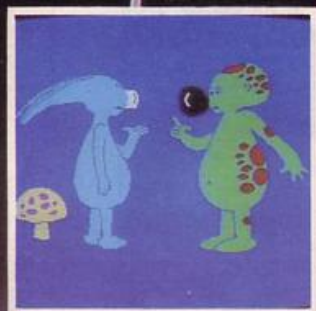
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MUTANT ARACHNID

CLEAR the maze of the spiders' eggs. You will be pursued by a mutant arachnid determined to protect the eggs. There are eight mazes to complete and each is more difficult than the previous one. **Mutant Arachnid** was written for the 16K Spectrum by Kristian Derry, aged 15, of Ilford, Essex.

```

10 BORDER 3: PAPER 3: INK 1: C
LS : GO SUB 9000
20 LET st=1: LET lv=3
30 LET a$=".....": GO SUB
st*100+1900
35 RESTORE 8900: FOR n=1 TO st
: READ lm: NEXT n
40 LET y=19: LET x=15: LET a=2
: LET b=15
50 LET g$= SCREEN$ (a,b)
60 PRINT AT a,b;"B"
70 LET a$= INKEY$
75 PRINT AT y,x;" "
80 LET x=x+(a$="8" AND ATTR (
y,x+1)=41)-(a$="5" AND ATTR (y,
x-1)=41)
85 LET y=y+(a$="6" AND ATTR (
y+1,x)=41)-(a$="7" AND ATTR (y-
1,x)=41)
90 IF SCREEN$ (y,x)=". " THEN
LET lm=lm-1: BEEP .01,0
91 IF y=a AND x=b THEN GO TO
300
94 PRINT AT y,x;"A"
96 IF lm=0 THEN GO TO 700
97 PRINT AT a,b;g$
98 IF RND >.6 THEN GO TO 50

99 LET aa=a
100 LET a=a+(a<y AND ATTR (a+1,
b)=41)-(a>y AND ATTR (a-1,b)=4
1)
101 IF a <> aa THEN GO TO 105

103 LET b=b+(b<x AND ATTR (a,b
+1)=41)-(b>x AND ATTR (a,b-1)=4
1)
105 IF y=a AND x=b THEN GO TO
300
110 GO TO 50
300 BEEP .2,-2: BEEP .3,-10: BE
EP .4,-18
304 LET lv=lv-1
305 PAPER 3: CLS : IF lv=0 THEN
PRINT AT 10,10; FLASH 1;"Game
Over": GO TO 1030
306 PRINT AT 10,10;"Lives:";lv
: PAUSE 0: CLS : GO TO 30
700 DATA 10,6,1,-6
710 DATA 8,5,1,-6
720 DATA 6,3,-1,-6
730 DATA 8,5,1,-6

```

```

735 FOR j=1 TO 2: RESTORE 700

740 FOR m=1 TO 4: FOR n=1 TO 4:
READ a: BEEP .1,a: NEXT n: NEXT
m
750 NEXT j
755 IF st=8 THEN GO TO 1000
756 LET st=st+1
760 PAPER 3: CLS : PRINT AT 10
,10; FLASH 1;"Well Done": AT 12
,10;"Sheet No.":st; AT 14,10;"Liv
es:";lv
770 PAUSE 0
780 CLS : GO TO 30
1000 DATA 4,-5,0,4,2,-5,-1,2,0,-
8,-3,0,-1,-8,-5,-1,-3,-12,-7,-3,
-5,-12,-8,-5,-3,-12,-7,-3,-1,-10
,-5,-1
1010 PAPER 3: CLS : PRINT AT 10
,10; FLASH 1;"Well Done!"
1020 FOR n=1 TO 32: READ a: BEEP
.4,a: NEXT n
1030 PAUSE 0: RUN
2000 PAPER 5: PRINT AT 2,10;a$;
AT 7,10;a$; AT 14,10;a$; AT 19
,10;a$; FOR n=2 TO 7: PRINT AT n
,10;"."; AT n,20;"."; AT 12+n,10
;"."; AT 12+n,20;"."; AT 6+n,15;
".": NEXT n: RETURN
2100 PAPER 5: PRINT AT 2,5;a$;
AT 7,5;a$; AT 14,5;a$; AT 19,5;a
$; AT 7,15;a$; AT 14,15;a$; FOR
n=2 TO 7: PRINT AT 0+n,5;"."; A
T 12+n,5;"."; AT 0+n,15;"."; AT
12+n,15;"."; AT 6+n,15;"."; AT 6
+n,24;".". NEXT n
2101 RETURN
2200 PAPER 5: FOR n=2 TO 5: PRIN
T AT n,15;"."; AT n,10;"."; AT
n+3,20;"."; AT n+10,20;"."; AT n
+7,10;"."; AT n+14,10;"."; AT n+
3,15;"."; AT n+7,15;"."; AT n+11
,15;"."; AT n+14,15;".". NEXT n

2201 PRINT AT 2,10;a$ ( TO 5); A
T 5,10;a$; AT 9,10;a$;"."; AT 12
,10;a$; AT 16,10;a$;"."; AT 19,1
0;a$ ( TO 5)
2202 RETURN
2300 PAPER 5: PRINT AT 2,8;a$;
AT 12,8;a$; AT 19,15;a$; AT 10,1
5;a$; FOR n=3 TO 11: PRINT AT n

```

```

,8;"."; AT n,17;"."; AT n+8,15;"
."; AT n+8,24;"."; AT n-1,20;"
."; AT n+8,12;"(" AND n>3): NEXT
n
2301 RETURN
2400 PAPER 5: PRINT AT 2,10;a$;
AT 7,10;a$; AT 14,10;a$; AT 19
,10;a$; AT 5,4;a$; AT 16,4;a$; AT
5,17;a$; AT 16,17;a$; FOR n=2 T
O 7: PRINT AT n,10;"."; AT n,20
;"."; AT 12+n,10;"."; AT 12+n,20
;"."; NEXT n
2401 FOR n=6 TO 15: PRINT AT n
,4;"."; AT n,13;"."; AT n,17;"
."; AT n,26;".". NEXT n: RETURN
2500 LET a$=a$ ( TO 5): PAPER 5:
PRINT AT 2,13;a$; AT 6,13;a$: P
RINT AT 19,13;a$; AT 15,13;a$;
AT 9,4;a$; AT 13,4;a$; AT 9,22;a
$; AT 13,22;a$
2501 FOR n=3 TO 5: PRINT AT n,1
3;"."; AT n,17;"."; AT 13+n,13;"
."; AT 13+n,17;"."; AT 7+n,4;"
."; AT 7+n,8;"."; AT 7+n,22;"
."; AT 7+n,26;".". NEXT n: PRINT AT
11,8;a$;a$;a$; FOR n=7 TO 14: PR
INT AT n,15;".". NEXT n
2502 RETURN
2600 PAPER 5: FOR n=5 TO 16: PRI
NT AT n,13;"."; AT n,17;".". NE
XT n: PRINT AT 10,4;a$; AT 10,1
7;a$; AT 5,13;a$ ( TO 5); AT 16,1
3;a$ ( TO 5); FOR n=2 TO 5: PRINT
AT n,15;"."; AT 14+n,15;".". N
EXT n
2601 RETURN
2700 PAPER 5: PRINT AT 6,10;a$;
AT 14,10;a$; AT 10,7;a$; AT 10
,10;a$; AT 10,14;a$; FOR n=1 TO 1
9: PRINT AT n,15;".". NEXT n: F
OR n=6 TO 14: PRINT AT n,10;"
."; AT n,20;".". NEXT n
2701 RETURN
8900 DATA 65,89,79,86,131,83,53,
66
9000 DATA 56,56,16,124,16,40,68,
0
9005 DATA 73,42,28,127,28,42,73,
0
9010 RESTORE 9000: FOR n= USR "a
" TO USR "b"+7: READ a: POKE n,
a: NEXT n: RETURN

```




TENNIS ANIMATION

BEGINNER

AS THE NAME suggests, this is an animation program which depicts two figures playing tennis. Although the perspective of the court is slightly wobbly the idea is interesting and it is a good example of animation.

Tennis Animation was written for the 16K Spectrum by Calvin Reid of Kirkwall, Orkney.

```
10 GO SUB 9000: LET h1=57: LET
hr=70: LET s1=12: LET sr=8
15 LET v=0: LET t=0: LET a=13:
LET b=4: LET c=11: LET d=24
20 LET g=110: FOR f=103 TO 53
STEP -5: PLOT g,f: DRAW 0,-15: L
ET g=g+2: NEXT f
30 FOR f=0 TO 15 STEP 5: PLOT
110,103-f: DRAW 20,-50: NEXT f
```

```
40 PLOT 12,88: DRAW 190,0: DRA
W 24,-50: DRAW -190,0: DRAW -24,
50
41 PLOT 22,67: DRAW 70,0: DRAW
-10,20: DRAW 24,-49
42 PLOT 212,67: DRAW -70,0: DR
AW -10,20: DRAW 24,-49
44 PRINT AT a,b;"A": AT a+1,b
;"B"
45 PRINT AT c,d;"C": AT c+1,d
;"D": PAUSE 5
47 PRINT AT a,b;"E": AT a+1,b
;"F"
48 PAUSE 5: BEEP .01,0: PRINT
AT a,b;"A": AT a+1,b;"B"
50 FOR n=36 TO 190 STEP s1: PL
OT n,50+h1*SIN (n/235*PI )
```

```
52 PLOT OVER 1;n,50+h1*SIN (
n/235*PI )
55 IF n>170 THEN PRINT AT c,
d;"G": AT c+1,d;"H"
56 IF t=1 THEN GO TO 58
57 IF h1<65 AND n>160 AND t=0
THEN LET d=d-1: PRINT AT c,d;"
C ": AT c+1,d;"D ": LET t=1
58 IF t=0 THEN GO TO 60
59 IF h1>72 AND n>160 AND t=1
THEN LET d=d+1: PRINT AT c,d-1
;" C": AT c+1,d-1;" D": LET t=0
```

```
60 NEXT n
62 PAUSE 5: PRINT AT c,d;"C":
AT c+1,d;"D": BEEP .01,0
65 LET h1= RND *26+57: LET s1=
RND *16+4
70 FOR n=190 TO 44 STEP -sr: P
LOT n,40+hr*SIN (n/255*PI )
72 PLOT OVER 1;n,40+hr*SIN (
n/255*PI )
74 IF n<64 THEN PRINT AT a,b
;"E": AT a+1,b;"F"
76 IF v=1 THEN GO TO 78
77 IF hr<73 AND n<60 AND v=0 T
HEN LET b=b+1: PRINT AT a,b-1;
" A": AT a+1,b-1;" B": LET v=1
```

```
78 IF v=0 THEN GO TO 80
79 IF hr>85 AND n<60 AND v=1 T
HEN LET b=b-1: PRINT AT a,b;"A
": AT a+1,b;"B ": LET v=0
80 NEXT n
82 PAUSE 5: PRINT AT a,b;"A":
AT a+1,b;"B": BEEP .01,0
83 PLOT 22,67: DRAW 70,0
85 LET hr= RND *30+65: LET sr=
RND *16+4
87 PLOT 12,88: DRAW 190,0
90 GO TO 50
9000 FOR f=1 TO 8: FOR g=0 TO 7:
READ a: POKE USR CHR$ (143+f)
+g,a: NEXT g: NEXT f: RETURN
9010 DATA 0,0,24,24,255,56,92,92
,92,154,153,148,212,210,18,27
9020 DATA 0,0,24,24,8,28,58,58,5
8,89,153,41,43,75,72,216
9030 DATA 3,3,25,25,255,62,92,92
,92,152,152,148,20,18,18,27
9040 DATA 192,192,152,152,72,60,
58,58,58,25,25,40,40,72,72,216
```

MANIC AXE was written for the issue one or two 16K Spectrum by Carl Thompson, aged 13, of Hessle, N Humberside. Avoid the axe which homes-in on you and try to survive for as long as possible. The keys to use are Q and A for up and down and O and P to move left and right. You can also move diagonally because the program uses the 'IN' function.



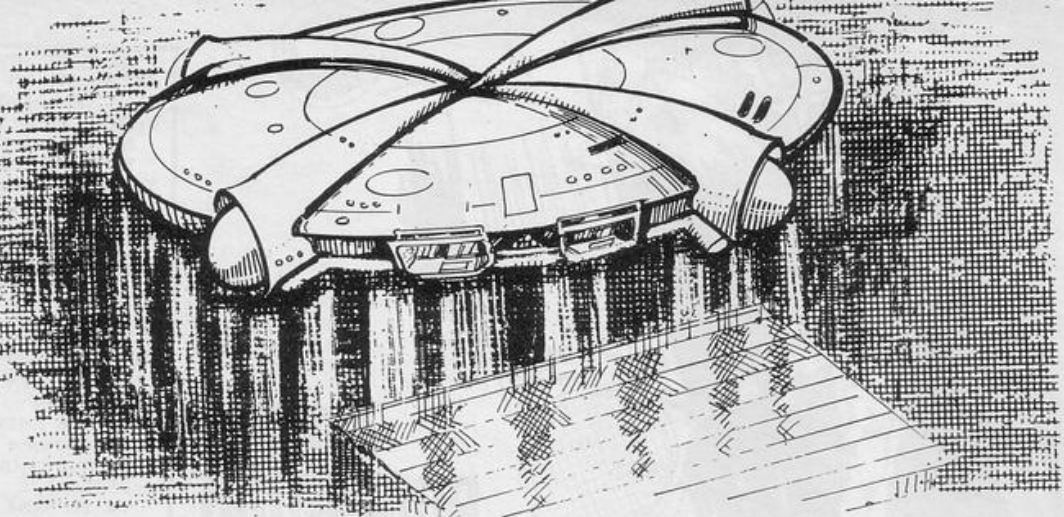
MANIC AXE

BEGINNER

```
10 REM MANIC AXE
20 FOR n= USR "a" TO USR "c"+
7: READ a: POKE n,a: NEXT n
30 DATA 171,106,255,90,255,102
,90,126,1,1,3,7,12,24,48,96,192,
224,240,240,224,192,0,0
40 BORDER 0: PAPER 0: INK 7: B
RIGHT 1: CLS
43 PRINT FLASH 1: AT 10,10;"M
ANIC AXE!": PAUSE 100: CLS: PR
INT FLASH 1: AT 10,0;"AVOID THE
AXE FOR AS LONG AS": PRINT AT
11,8: FLASH 1;"POSSIBLE": PAUSE
200: CLS
50 LET hi=0
60 LET sc=0: LET a=10: LET b=1
5: LET c=21: LET d=0
70 LET a=a+2*( IN 65022=254 AN
D a<20)-2*( IN 64510=254 AND a>0
)
80 LET b=b+2*( IN 57342=254 AN
D b<31)-2*( IN 57342=253 AND b>1
)
90 PRINT AT a,b;"A"
100 BEEP .004,0
105 PRINT AT 0,0;"SCORE ";sc;
AT 0,17;"HI-SCORE ";hi
110 LET c=c+(a>c AND c<21)-(a<c
```

```
AND c>0)
120 LET d=d+(b>d AND d<31)-(b<d
AND d>0)
130 PRINT INK 6: AT c,d;"B": I
NK 2: AT c,d+1;"C"
140 BEEP .004,2
150 LET sc=sc+1
160 IF a=c AND b=d OR a=c AND b
=d+1 THEN GO TO 300
170 PRINT AT a,b;" "; AT c,d;"
"
180 GO TO 70
300 CLS: BEEP 1,-30: FOR n=0 T
O 7: BORDER n: PAUSE n+1: BEEP .
004,n: NEXT n: BORDER 0
```

```
310 IF sc >= hi THEN PRINT "IN
PUT YOUR NAME": INPUT n$: LET hi
=sc
320 CLS: PRINT: PRINT: PRINT
n$;" HOLDS THE HIGH SCORE": PRI
NT "YOU SCORED ";sc;" THAT TIME"
: PRINT: PRINT "ANOTHER GO? (Y/
N)"
330 POKE 23658,0: IF INKEY$="
" THEN GO TO 330
340 IF INKEY$="y" THEN CLS:
GO TO 60
350 IF INKEY$="n" THEN STOP
360 GO TO 330
```

PLUTONIUM

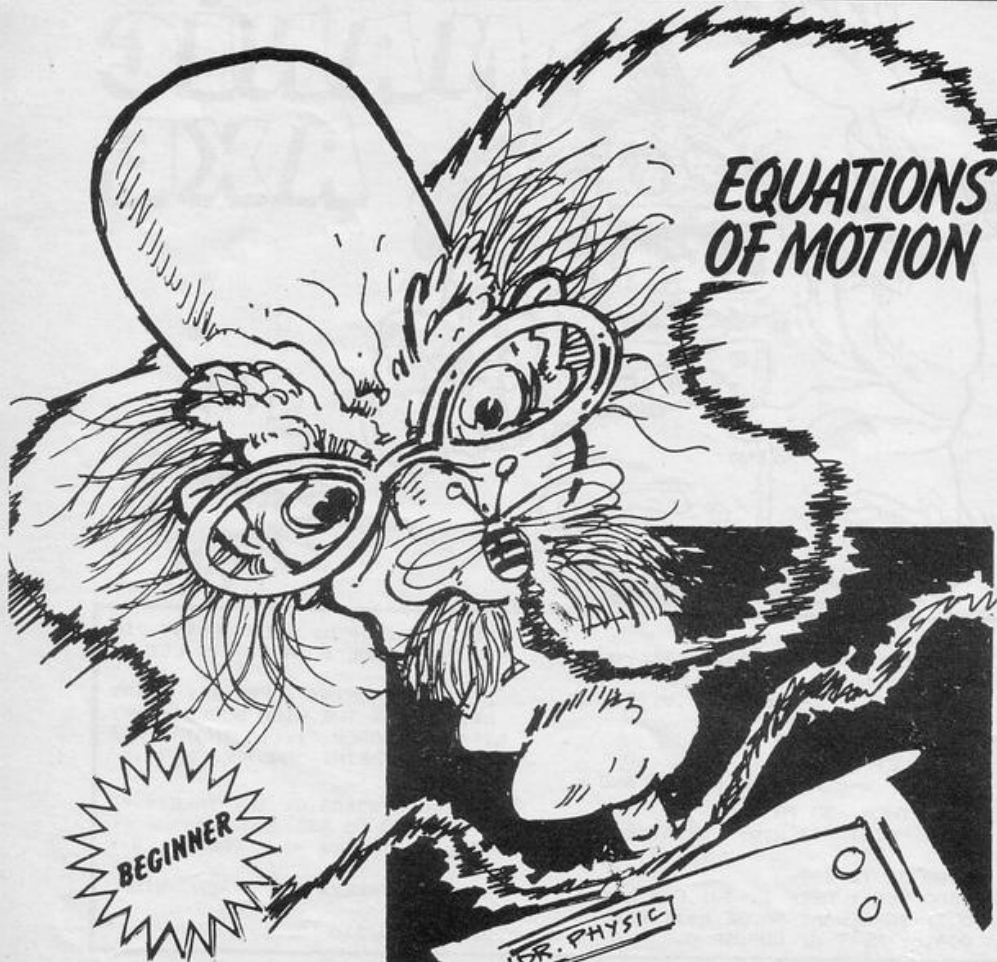
SPACECRAFT carrying deadly plutonium waste attempt to land on a moving platform which you control. As the craft can travel in only one direction you must guide the platform so that a safe landing occurs. If the ship misses the platform it will crash and the wreckage of the spacecraft will build up. Should the wreckage reach the platform the game will end. Enter a skill level from 1-4, 1 being easy, and then you will be ready to play.

Plutonium was written for the 1K ZX-81 by S Huggins of Northampton.

```

5 INPUT L
10 LET H=L*VAL "3"
30 DIM A(VAL "4")
40 LET P=VAL "INT (RND*4)+1"
45 PRINT AT VAL "15",H;" "
50 LET J=L*P
70 FOR I=8 TO 20-A(P)
80 LET A$=INKEY$
90 LET H=H+(A$="8")-(A$="5")
110 PRINT AT I,J;"@";AT I+1,J;"
    U";AT I-1,J;" ";AT 15,H;" "
120 IF I=15 AND ABS (H+2-J) <=1
    THEN GOTO 40
125 NEXT I
126 PRINT AT I-1,J;"# "
130 LET A(P)=A(P)+1
135 IF A(P)=7 THEN GOTO 150
140 GOTO 40
150 PRINT "SCORE:";VAL "40-(A(1)
    )+A(2)+A(3)+A(4))"

```



EQUATIONS OF MOTION is a short program which can be used by physics students to solve problems using the four equations. Choose the unknown you wish to find and then enter three known values. The computer selects the appropriate equation and the form the equation must take and gives the unknown answer. Values must be entered in SI units, i.e., velocity in M/S, acceleration in M/S², time in seconds and distance in metres.

Written for the 1K ZX-81 by T Lewis of Pembroke, Dyfed.

```

10 DIM A(3)
20 PRINT "1) INITIAL VELOCITY,U"
30 PRINT "2) FINAL VELOCITY,U"
40 PRINT "3) DISTANCE,S"
50 PRINT "4) TIME,T"
60 PRINT "5) ACCELERATION,A"
70 PRINT
80 PRINT "WHAT DO YOU WISH TO FIND (1-5)"
90 INPUT L
100 IF L>5 OR L<1 THEN GOTO 100
110 CLS
120 LET X$="UUUUA"
130 LET B$="245145124312124"
140 FOR F=1 TO 5
150 PRINT "ENTER ";X$(VAL (B$(
    (L-1)*3)+F));"
160 INPUT A(F)
170 NEXT F
180 IF L=VAL "1" THEN LET C=A(1)
    -(A(2)*A(3))
190 IF L=VAL "2" THEN LET C=A(1)
    +(A(3)*A(2))
200 IF L=VAL "3" THEN LET C=((A
    (1)+A(2))/2)*A(3)
210 IF L=VAL "4" THEN LET C=A(1)
    /(A(2)+A(3))/2
220 IF L=VAL "5" THEN LET C=(A
    (2)-A(1))/A(3)
230 PRINT X$(L);"=";C

```




SEARCH

FLY THROUGH one of two caverns to collect jam hidden in the tunnels. Use the cursor keys to steer through the caverns and try to maintain control of the helicopter as it is blown about. The score is recorded each time the jam is collected and, as one route is more difficult, the points are awarded accordingly.

Jam Search was written for the 16K Spectrum by M Bradford of Heywood, Lancs.

```

1 RANDOMIZE
2 GO SUB 9000
3 BORDER 1
4 CLS
8 LET h=0
9 LET s=0
40 LET y=6: LET x=15
50 GO SUB 500
60 IF s>h THEN LET h=s
100 PRINT INK 1; AT y,x;"A"
110 BEEP .005,50
120 PRINT INK 1; AT y,x;"B"
130 BEEP .005,51
140 PRINT AT y,x;" "
170 LET b=INT(RND*30-15)
180 IF b>10 THEN LET x=x+1
190 IF b<-10 THEN LET x=x-1
210 LET x=x+(INKEY$="B")-(INKEY$="5")
220 LET y=y+(INKEY$="6")-(INKEY$="7" AND y>6)
250 GO TO 350
340 PRINT AT 5,11; INK 0; PAPER 2;"YOUR DEAD"; AT 7,5; PAPER 3;"PRESS ANY KEY TO PLAY"; BEEP 2,.5; PAUSE 0; PAUSE 0; CLS: GO TO 9
350 PRINT AT 0,2;"SCORE=";s; AT 0,20;"HiSCORE=";h
400 IF ATTR(y,x)=60 THEN GO TO 340
410 IF ATTR(y,x)=16 THEN LET s=s+50: BEEP .09,13: BEEP .09,14: BEEP .09,13: BEEP .05,10: BEEP .05,10: GO TO 10

```

```

420 IF ATTR(y,x)=24 THEN LET s=s+500: BEEP .09,15: BEEP .09,14: BEEP .09,15: BEEP .09,16: BEEP .05,17: BEEP .05,17: BEEP .05,17: GO TO 10
490 GO TO 100
500 FOR i=0 TO 7: PRINT; INK 4; AT i,0;"(ig1)"; AT i,31;"(ig2)"; NEXT i
510 PRINT INK 4; AT 8,0;"(2*ig8:ig1)"; AT 8,28;"(ig2:3*ig8)"; AT 9,0;"(6*ig8:ig1)"; AT 9,25;"(ig2:7*ig8)"; AT 10,0;"(12*ig8:ig1)"; AT 10,18;"(ig2:13*ig8)"; 520 PRINT INK 4; AT 11,0;"(13*ig8:ig1)"; AT 11,17;"(ig2:15*ig8)"; AT 12,0;"(13*ig8:ig4)"; AT 12,17;"(ig2:14*ig8)"; AT 13,0;"(1*ig8:ig4)"; AT 13,17;"(15*ig8)"; AT 14,0;"(9*ig8:ig4)"; AT 14,17;"(10*ig8)"; AT 14,30;"(2*ig8)"; 530 PRINT INK 4; AT 15,0;"(4*ig8)"; AT 15,12;"(ig2:ig8)"; AT 15,17;"(10*ig8)"; AT 15,30;"(2*ig8)"; AT 16,0;"(4*ig8)"; AT 16,10;"(ig2:3*ig8)"; AT 16,17;"(g7:8*ig8:ig4)"; AT 16,30;"(2*ig8)"; 540 FOR i=17 TO 20: PRINT INK 4; AT i,0;"(14*ig8)"; NEXT i: PRINT INK 4; AT 17,18;"(g7:6*ig8:ig4)"; AT 17,29;"(ig2:3*ig8)"; AT 18,14;"(ig1)"; AT 18,19;"(g7:3*ig8:ig4)"; AT 18,28;"(ig2:3*ig8)"; AT 19,27;"(ig2:4*ig8)"; AT 1

```

```

9,14;"(ig8:ig1)"; AT 20,14;"(2*ig8:ig1)"; AT 20,25;"(ig2:6*ig8)"; AT 21,0;"(32*ig8)"; 550 PRINT PAPER 6; AT 14,4;" "; PAPER 2; AT 15,4;"JAM"; AT 16,4;" "; PAPER 6; AT 13,27;" "; PAPER 3; AT 14,27;"JAM"; AT 15,27;" "
560 PRINT INK 5; AT 0,10;"(ig2:2*ig8:ig1)"; AT 1,7;"(ig2:7*ig8:ig1)"; AT 1,24;"(ig2:ig8:ig1)"; AT 2,7;"(9*ig8:ig1)"; AT 2,21;"(ig2:5*ig8:ig1)"; AT 3,7;"(g7:9*ig8)"; AT 3,21;"(7*ig8)"; AT 4,8;"(g7:7*ig8:ig4)"; AT 4,21;"(g7:5*ig8:ig4)"; AT 5,13;"(g7:ig4)"; AT 5,24;"(g7:ig8:ig4)"; 570 RETURN
9000 FOR i=0 TO 15
9010 READ x: POKE USR "a"+i,x
9020 NEXT i
9030 DATA 0,255,8,156,250,57,29,14,0,60,8,156,250,57,29,14
9040 PRINT; INK 1; AT 0,7;"JAM SEARCH "; AT 2,0; INK 0;"YOU R JOB IS TO COLLECT JAM FROM THE JARS HIDDEN IN TWO CAVES. YOU SCORE POINTS FOR COLLECTING THE JAM AND BECAUSE ONE ROUTE IS MORE DANGEROUS POINTS ARE AWARDED ACCORDINGLY "
9050 PRINT " "; PRESS ANY KEY TO PLAY"; PAUSE 0
9090 RETURN

```

```

10 LET hs=0: PAPER 5: BORDER 5
: INK 0: CLS
20 FOR n=USR "a" TO USR "c"+7: READ a: POKE n,a: NEXT n
30 DATA 60,126,126,66,90,90,90,66,126,102,102,126,126,60,24,184,185,146,124,56,56,0,91
40 CLS: BEEP .05,20: BEEP .05,30: LET s=0: LET y=16
50 LET y=y+(INKEY$="B" AND y<30)-(INKEY$="5" AND y>0)
60 LET a=ATTR(1,y+1)
70 IF a=41 THEN LET s=s+1: BEEP .005,20
80 IF a=56 THEN GO TO 110
90 PRINT AT 1,y+1;"B"; AT 0,y;"A "; FOR n=1 TO 2: PRINT AT 20,RND*30; PAPER 7;" "; AT 21,RND*30;" "; NEXT n: PRINT AT 21,RND*31; PAPER 5; INK 1;"C "
100 LET l=USR 3280: BEEP .005,s/2: GO TO 50
110 PRINT AT 0,y: FLASH 1; PAPER 2; INK 6;" "; AT 1,y;" "; FLASH 0: FOR n=20 TO -20 STEP -.75: BEEP .01,n: NEXT n
120 PRINT AT 0,0; PAPER 2; INK 7;"YOU RESCUED ";s;" PEOPLE": IF s>hs THEN LET hs=s: PRINT AT 1,0; PAPER 1; INK 7;"A NEW HIGH SCORE !!!": FOR n=-20 TO 20: BEEP .005,n: NEXT n
130 PRINT AT 3,0; PAPER 6; INK 0;"The current hi-score is ";hs; AT 21,0;" PRESS ANY KEY FOR AN OTHER GAME "; PAUSE 0; PAUSE 0: GO TO 40

```

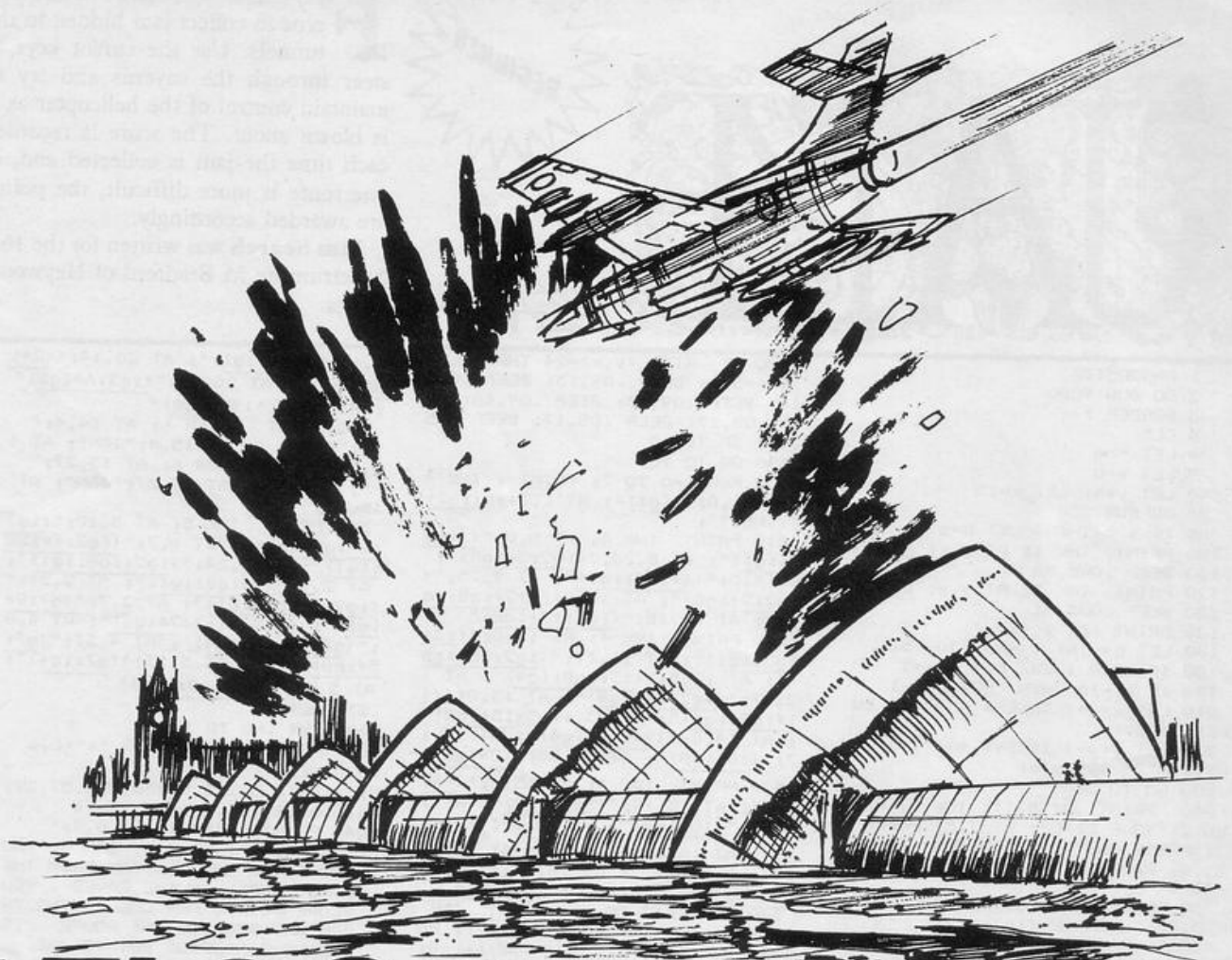


CAPTAIN your ship using keys 5 and 8 and pick up the survivors of a storm. Avoid the icebergs, as crashing into one will destroy your ship.

Shipwreck was written for the 16K Spectrum by G Creasey, of Ashford, Kent.



SHIPWRECK



FLOOD BARRIER

PREVENT the suicide pilots colliding with the barrier causing flooding. Use the 'F' key to fire a missile. **Flood Barrier** was written for the 16K ZX-81 by Colin Todd of Ripon, N Yorks.

The loop at line 20 draws the barrier, while the second loop at line 50 draws the water. The missile launcher is at a fixed position and is drawn at line 80.

The next routine deals with moving the aircraft and checking, but first a random line number for the aircraft is found at line 300. To make the aircraft move, you first press a key — line 100 — and the loop at line 110 moves the aircraft.

There two checks are made. First, line 130 checks to see if the aircraft has collided with the missile launcher and, if it has, a jump is made to the explosion routine at line 500. Second, line 140 checks to see if a missile has been fired; if it has, a jump to the missile routine is made.

The missile routine at line 400 moves the missile and if there is a hit — line 430 — the explosion routine at line 500 is called. Notice that the explosion routine is used from two points in the program. Last, the routine at line 160

floods the barrier and line 195 — within a loop — flashes 'GLUG'.

Things can be made more difficult by moving the missile launcher nearer to the right of the screen. To do that, substitute all occurrences of '20' in the listing with the required column number. Also remove line 100 and replace with:

```
100 FOR D=1 TO INT(RND*200)
105 NEXT D
```

Routines used

Although there are no real routines in the program, the different operations have been divided into the following sections:

- 5-80 Initialise variables and draw screen.
- 90-150 Move aircraft.
- 160-196 Flood barrier.
- 200-230 Print score.
- 300-310 Initialise row number of aircraft.
- 400-456 Fire missile.
- 460-470 Increase score.
- 500-530 Missile launcher hit.

Variables used

- C Holds row number for rising water.
- N Holds random row number along which aircraft travels.
- P Holds number of aircraft shot down.
- X Holds column position of aircraft.
- Y Used to hold row position of missile.

```

5 LET P=0
6 CLS
10 FAST
15 PRINT AT 0,8;"FLOOD BARRIER"

20 FOR Y=8 TO 21
30 PRINT AT Y,12;"█"
40 NEXT Y
50 FOR Y=12 TO 21
60 PRINT AT Y,0;"█"
70 NEXT Y
80 PRINT AT 21,20;"+"
90 SLOW
95 GOSUB 300
100 IF INKEY$="" THEN GOTO 100
110 FOR X=31 TO 12 STEP -1
120 PRINT AT N,X;"<";AT N,X;" "
130 IF N=21 AND X=20 THEN GOTO 500
140 IF INKEY$="F" THEN GOSUB 400
150 NEXT X
160 LET C=21
170 FOR X=12 TO N
180 PRINT AT X,0;"█"
185 LET C=C-1
190 NEXT X
194 FOR X=1 TO 30
195 PRINT AT 21,20;"GLUG";AT 21,20;" "
196 NEXT X
200 PRINT AT 5,6;"YOU SHOT ";P;" PLANES"
210 PRINT AT 8,6;"PRESS ANY KEY TO CONTINUE"
220 IF INKEY$="" THEN GOTO 220
230 GOTO 5
300 LET N=INT (RND*10)+12
310 RETURN
400 PRINT AT N,X;"<"
410 FOR Y=20 TO N STEP -1
420 PRINT AT Y,20;"*";AT Y,20;" "
430 IF Y=N AND X=20 THEN GOTO 450
440 NEXT Y
455 PRINT AT N,X;" "
456 RETURN
460 LET P=P+1
470 GOTO 95
500 FOR X=1 TO 30
510 PRINT AT 21,20;"█";AT 21,20;"+"
520 NEXT X
530 GOTO 200

```


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Locust attack

```

4 LET HI=0
5 CLS
10 PRINT "
1ST LOCL
20 PRINT "
30 PRINT "
40 PRINT "
50 PRINT AT 15,1;"DO YOU WANT
INSTRUCTIONS ?(Y/N)"
60 PAUSE 1000
65 LET I=0
70 IF INKEY$="Y" THEN GOSUB 10
80
90 CLS
100 LET N=1
105 LET E=10
110 LET A=0
115 LET C=1
120 LET B=0
125 LET D=1
130 DIM A$(4,4)
140 LET A$(1,1)=" "
150 LET A$(2,1)=" "
160 LET A$(3,1)=" "
170 LET A$(4,1)=" "
175 PRINT AT 9,5;

```



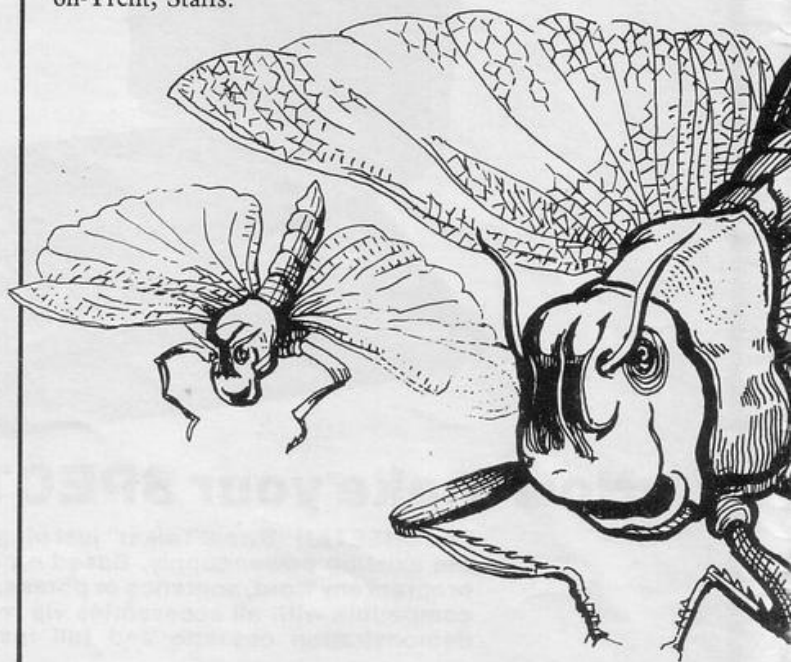
```

175 PRINT AT 21,E;" "
180 PRINT AT A,B;A$(N,1);AT A+2
,B;A$(N,2);AT A,B+2;A$(N,3);AT A
+2,B+2;A$(N,4)
181 IF A<2 OR A>18 OR B>28 OR B
<1 THEN GOSUB 500
185 IF INKEY$="" THEN GOTO 290
187 IF I<>0 THEN GOSUB 650
190 PRINT AT A,B;" ";AT A+2,B;"
";AT A,B+2;" ";AT A+2,B+2;" "
200 LET A=A+C
210 LET B=B+D
230 IF I<>0 THEN GOSUB 650
250 IF INKEY$="" THEN GOTO 180
260 LET E=E+(INKEY$="8" AND E<2
7)-(INKEY$="5" AND E>0)
263 LET F=INT (RND*3)
265 IF F=1 THEN LET D=D-(D*2)
267 IF SGN D=-1 THEN LET N=2
269 IF SGN D=1 THEN LET N=1

```

PROTECT the tree from the locust attack by spraying the locusts with insecticide. Press F once to fire the insecticide and again to spray the locusts. Your score varies according to the amount of tree remaining at the end of the game.

Locust Attack was written for the 16K ZX-81 by Andrew Bates, of Stoke-on-Trent, Staffs.



```

270 PRINT AT 21,E;" "
280 GOTO 180
290 LET E=E+(INKEY$="8" AND E<2
7)-(INKEY$="5" AND E>0)
293 IF INKEY$="F" THEN GOSUB 60
300
305 LET C=C-(C*2)
310 PRINT AT 21,E;" "
310 GOTO 190
320 IF A<2 THEN LET C=1
330 IF A>18 THEN LET C=-1
340 IF B<1 THEN LET D=1
350 IF B>28 THEN LET D=-1
360 RETURN
370 IF I<>0 THEN GOSUB 600
380 IF I<>0 THEN RETURN
390 LET G=18
400 LET H=E+1
410 LET I=-2
420 LET B$="I"
430 RETURN
440 PRINT AT G,H;B$;AT G+2,H;"

```




```

660 LET G=G+I
670 IF G<=4 THEN GOSUB 800
680 RETURN
690 PRINT AT G,H-1;"...";AT G-1
H-2;"....."
700 PRINT AT G-2,H-3;".....";
AT G-3,H-4;"....."
710 PRINT AT A+2,B;
720 IF CHR$ PEEK (PEEK 16398+25
6*PEEK 16399)="." THEN GOSUB 200
0
730 PRINT AT A,B+2;
740 IF CHR$ PEEK (PEEK 16398+25
6*PEEK 16399)="." THEN GOSUB 205
0
750 PRINT AT A+2,B+2;
760 IF CHR$ PEEK (PEEK 16398+25
6*PEEK 16399)="." THEN GOSUB 210
0
770 PRINT AT A,B;
780 IF CHR$ PEEK (PEEK 16398+25

```

```

6*PEEK 16399)="." THEN GOSUB 215
0
820 PRINT AT G,H-1;" ";AT G-1
H-2;
830 PRINT AT G-2,H-3;" "
;AT G-3,H-4;" "
840 PRINT AT G+2,H;" "
850 LET I=0
860 RETURN
1000 CLS
1010 PRINT " LOCUST ATTA
CK"
1020 PRINT "USE KEYS ""5"" AND
""3"" TO MOVE LEFT AND RIGHT
.PRESS ""F"" TO FIREAN INSECTISI
DE CAN.PRESS ""F"" AGAIN TO S
PRAY THE LOCUSTS."
1030 PRINT
1040 PRINT "YOU SCORE BY THE AMO
UNT OF TREE LEFT AT THE END OF T
HE GAME."
1050 PRINT " PRESS ANY KEY T
O CONTINUE"
1060 IF INKEY$="" THEN GOTO 1060
1100 RETURN
2000 LET A$(1,4)=""
2010 LET A$(2,4)=""
2020 IF A$(1)="" THEN GOSUB
4000
2030 IF A$(2)="" THEN GOSUB
4000
2040 RETURN
2050 LET A$(1,3)=""
2060 LET A$(2,3)=""
2070 IF A$(1)="" THEN GOSUB
4000
2080 IF A$(2)="" THEN GOSUB
4000
2090 RETURN
2100 LET A$(1,2)=""
2110 LET A$(2,2)=""
2120 IF A$(1)="" THEN GOSUB
4000
2130 IF A$(2)="" THEN GOSUB
4000
2140 RETURN
2150 LET A$(1,1)=""
2160 LET A$(2,1)=""
2170 IF A$(1)="" THEN GOSUB
4000
2180 IF A$(2)="" THEN GOSUB
4000
2190 RETURN
3000 REM PRINT AT A,B;A$(N,1);AT
A+2,B;A$(N,2);AT A,B+2;A$(N,3);
AT A+2,B+2;A$(N,4)
4000 LET O=0
4005 PRINT AT 5,10;"GAME OVER"
4010 FOR M=9 TO 20
4020 FOR N=5 TO 25
4030 PRINT AT M,N;
4040 IF CHR$ PEEK (PEEK 16398+25
6*PEEK 16399)<>"" THEN LET O=O+
1
4045 IF CHR$ PEEK (PEEK 16398+25
6*PEEK 16399)="." THEN LET O=O-1
4050 NEXT N
4055 FAST
4070 NEXT M
4075 SLOW
4080 PRINT AT 5,7;"YOUR SCORE IS
";O
4090 IF O>HI THEN LET HI=O
4095 PRINT AT 7,8;"HI SCORE IS "
;HI
4097 PRINT AT 9,7;"ANOTHER GO (Y
/N)?"
4100 IF INKEY$="Y" THEN GOTO 5
4110 IF INKEY$="N" THEN STOP
4120 GOTO 4100
9000 SAVE "LOCUST"
9010 RUN
9020 REM "LOCUST"

```


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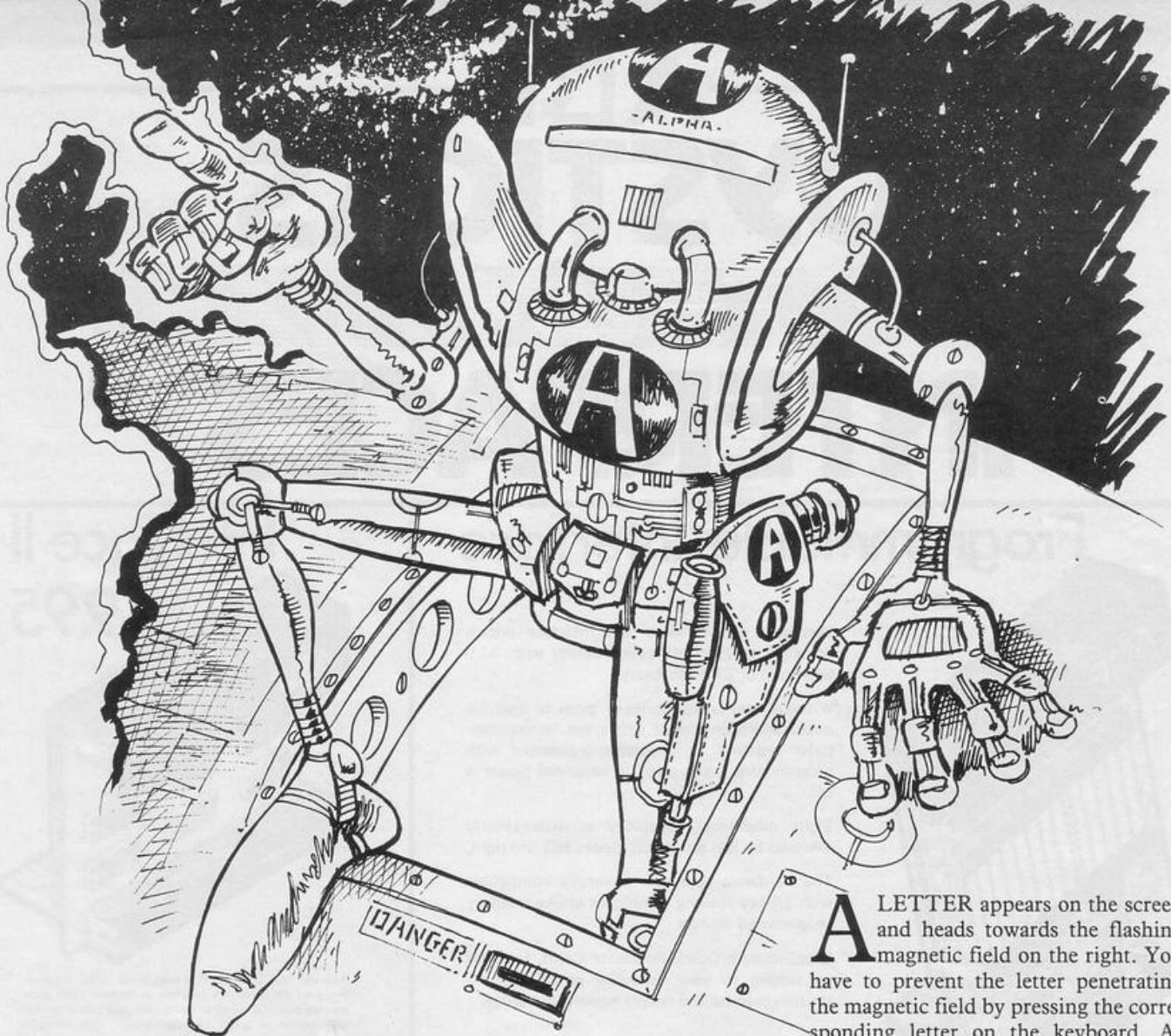
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ALPHA ATTACK

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Alpha Attack was written for the 16K Spectrum by Paul Stuhlfelder of Gwynedd, N Wales.

```

1 LET PHASE=1: LET SCORE=0: L
ET D=28: GO SUB 8000
2 PAPER 0: INK 7: BORDER 0: C
LS : LET TIME=.2
3 BORDER 0: PAPER 0: INK 7: P
RINT AT 2,1:"SCORE ":SCORE: PRI
NT AT 4,1:"PHASE ":PHASE
8 FOR H=1 TO 70: BEEP .005, R
ND *50: PLOT RND *250, RND *100
+60: NEXT H
9 INK 5
10 PLOT 0,0: DRAW 97,50
20 PLOT 255,0: DRAW -97,50
30 PLOT 137,50: DRAW 50,-50
40 PLOT 117,50: DRAW -50,-50
50 PLOT 70,50: DRAW -70,-15
60 PLOT 185,50: DRAW 70,-15
70 PLOT 0,50: DRAW 255,0
80 PLOT 127,50: DRAW 0,-50
90 PLOT 0,40: DRAW 255,0
100 PLOT 0,15: DRAW 255,0
110 PLOT 0,14: DRAW 255,0
120 INK 5: PLOT 0,0: DRAW 0,175
: DRAW 255,0: DRAW 0,-175: DRAW
-255,0
125 FOR L=1 TO 14: FLASH 1: PRI
NT INK RND *6+1: AT L,D:"*": N
EXT L: FLASH 0
200 POKE 23658,8
210 LET A=65+ RND *25
211 INK 6: PAPER 0
220 FOR X=1 TO 29
221 LET A$= CHR$ A
222 IF X=D THEN GO SUB 1000

```

```

230 PRINT AT 10,X;" ":A$
240 LET I$= INKEY$: IF I$="" T
HEN GO TO 249
242 IF I$=A$ THEN LET SCORE=SC
ORE+25-X: PRINT INK 7: AT 2,7:S
CORE: FOR G=1 TO 20: BEEP .01,G:
NEXT G: LET TIME=TIME-.01: PRIN
T AT 10,X;" ": GO TO 210
243 IF I$ <> A$ THEN GO SUB 20
00
249 BEEP TIME,X: IF TIME <= 0 T
HEN GO SUB 3000
250 NEXT X
251 PRINT AT 10,29;" "
300 GO TO 201
1000 CLS : FOR V=50 TO 1 STEP -1
: BEEP .004,V: NEXT V: PAPER 4:
INK 7: BORDER 4: CLS : PRINT IN
K 0: AT 13,6:"YOUR SCORE WAS ":S
CORE: FLASH 1: PAPER 1: PRINT A
T 10,6:"GAME OVER TOO SLOW": PAP
ER 2: PRINT AT 18,4:"PRESS ANY
KEY TO RE-RUN": PAUSE 4E4: FLASH
0: CLS : GO TO 1
1001 PRINT "SCORE=":SCORE
2000 CLS : FOR Y=22 TO 1 STEP -1
: BEEP .1,Y: BORDER RND *7: PRI
NT INK RND *6+1:"GAME OVER WRO
NG LETTER PRESSED": NEXT Y: PAUS
E 200: CLS : PRINT : PRINT " Y
OU SHOULD HAVE PRESSED ":A$: PRI
NT : PRINT AT 4,9:"YOU PRESSED
":I$: PRINT AT 10,8:"YOUR SCORE
WAS ":SCORE: PRINT AT 20,5:"PR

```

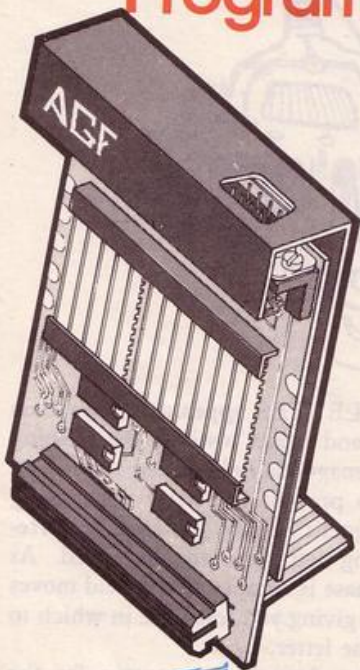
```

ESS ANY KEY TO RE-RUN": PAUSE 4E
4: GO TO 1
3000 CLS : PAPER 2: INK 7: BORDE
R 2: CLS : PRINT AT 1,7:"NOW IT
GETS HARDER!": PRINT AT 3,7:"Y
OU HAVE LESS TIME": PRINT : PRIN
T " THE MAGNETIC FIELD GETS CLOS
ER": FLASH 1: PRINT AT 10,10:"P
RESS ANY KEY": PAUSE 4E4: LET D=
D-1: LET PHASE=PHASE+1: FLASH 0:
GO TO 2
8000 PAPER 1: INK 6: BORDER 1: C
LS : PRINT " WELCOME TO ALFA(
BET)ATTACK": PRINT
8010 PRINT "YOUR MISSION IS TO L
OOK OUT FOR": PRINT
8020 PRINT " ALIEN SPACE CRAFT
WHICH LOOK": PRINT
8030 PRINT " JUST LIKE LETTERS
OF THE ": PRINT
8040 PRINT "ALPHABET. THE ONLY W
AY TO SAVE": PRINT
8050 PRINT " YOURSELF IS TO PRES
S THE RIGHT": PRINT
8060 PRINT "KEY,BEFORE IT PENETR
ATES THE": PRINT
8070 PRINT "FLASHING MAGNETIC FI
ELD ON THE"
8071 PRINT : PRINT "RIGHT HAND S
IDE OF THE SCREEN !!"
8080 FLASH 1: PRINT INK 7: PAPE
R 3: AT 20,4:"PRESS ANY KEY TO P
LAY": FLASH 0: PAUSE 4E4: GO TO
2

```


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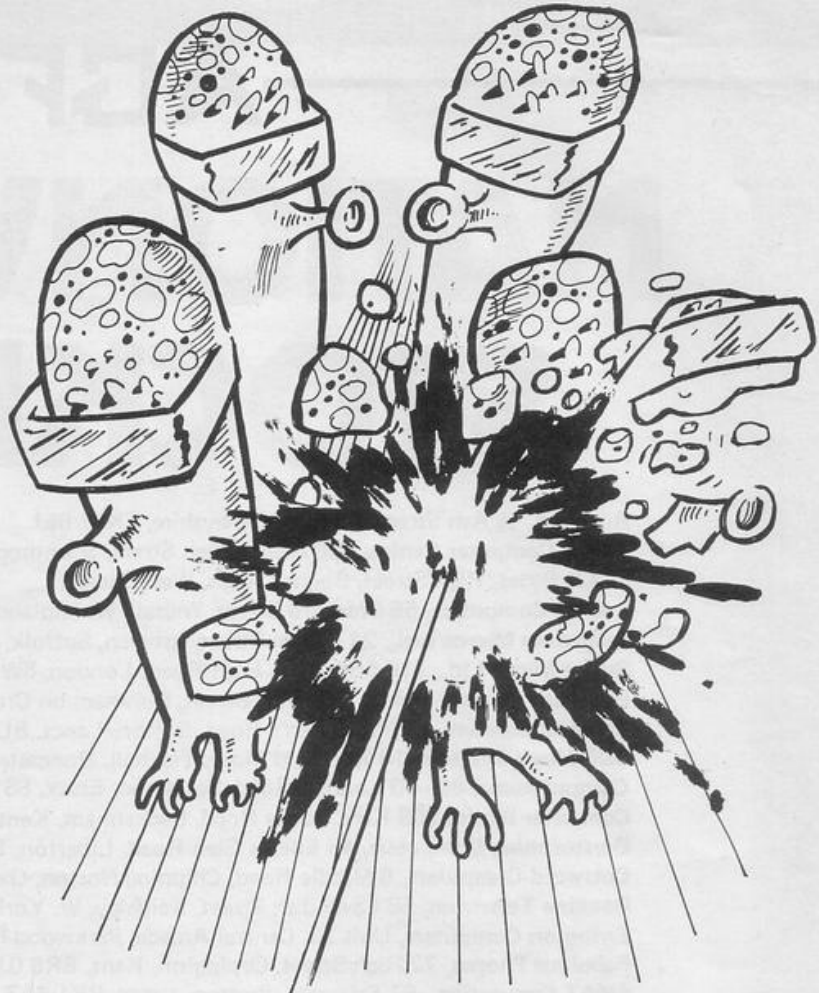
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RUNWAY

THERE ARE six horizontal runways and the android can go along any of them. When you can see which runway is being used you must go to it and fire at the android before it reaches the end. If the android reaches the end of the runway before being shot it will destroy you. As the game progresses the runway becomes shorter, thus giving you less time to fire.

Runway was written for the 16K ZX-81 by James Hutchinson, aged 13, of Kings Lynn, Norfolk.



```

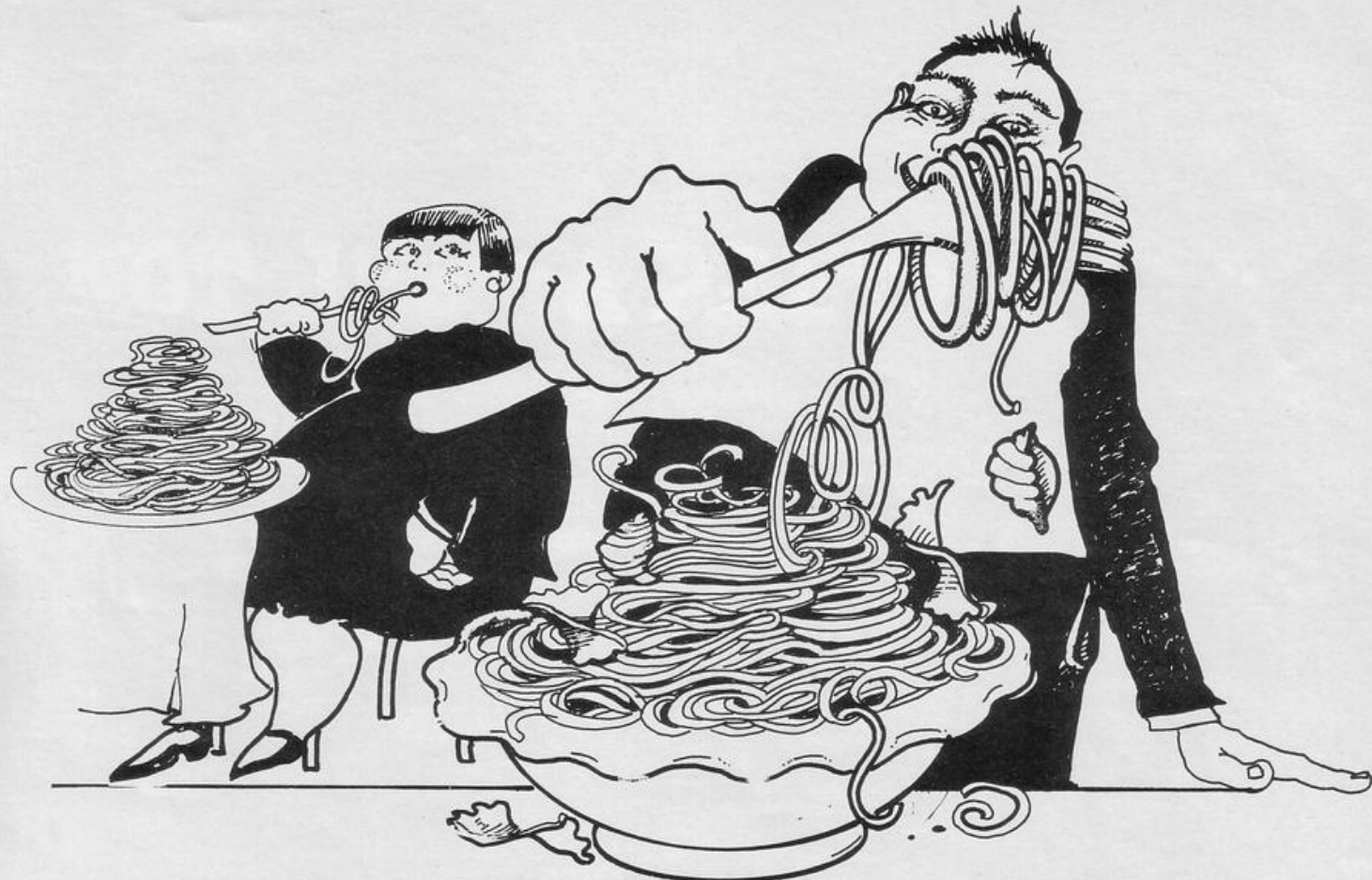
2  GOSUB 400
3  RAND
4  LET HI=0
5  LET W=15
6  LET L=2
7  CLS
10 LET S=0
15 LET I=0
200 CLS
21 FOR C=1 TO 12 STEP 2
30 PRINT AT C,0;" "
47 NEXT C
50 LET A=6
60 LET N$=""
70 LET X=0
80 LET Q=INT (RAND*6)*2
85 PRINT AT Q,X;N$
90 PRINT AT A,W+2;"<"
100 IF X+4=W+1 THEN GOTO 300
110 LET X=X+1
120 IF INKEY$="6" AND A<10 THEN
GOSUB 150
130 IF INKEY$="7" AND A>0 THEN
GOSUB 180
135 IF INKEY$="0" THEN GOTO 210
140 GOTO 85
150 LET A=A+2
160 PRINT AT A-2,W+2;" "
170 RETURN
180 LET A=A-2
190 PRINT AT A+2,W+2;" "
200 RETURN
210 PRINT AT A,W+2;"<"
211 FOR B=W+1 TO (W+X+4)/2 STEP
220 PRINT AT A,B;"=";AT A,B;" "
221 PRINT AT Q,X;N$
222 LET X=X+1
225 IF X+4>W+1 THEN GOTO 300
230 NEXT B
235 LET I=I+1
240 IF A<0 THEN GOTO 85
245 PRINT AT Q,X;" "
250 LET S=S+(W+1-X)
251 IF I>40 AND W=15 THEN GOTO
270
252 IF I>130 AND W=13 THEN GOTO
270
260 GOTO 70
270 LET W=W-2

```

```

271 PRINT AT A,W+4;" "
272 FOR D=1 TO 12
273 PRINT AT D,W;" "
275 NEXT D
280 GOTO 50
300 CLS
305 PRINT "THE ANDROIDS HAVE DE
STROYED YOU."
310 IF S<=HI THEN GOTO 340
320 LET HI=S
330 PRINT AT 7,0;" *CONGR
ATULATIONS* YOU HAVE OBTAI
INED THE HI-SCORE."
340 PRINT AT 15,0;"SCORE=";S;"
HI-SCORE=";HI
350 PRINT " "
360 PRINT AT 21,0;"PRESS ANY KE
Y FOR ANOTHER GAME."
370 IF INKEY$="" THEN GOTO 370
380 GOTO 5
400 PRINT AT 0,12;" RUNWAY"
410 PRINT AT 1,8;" "
420 PRINT "IN THIS GAME, YOU HA
VE TO SHOOT"
430 PRINT "AS MANY ENEMY SHIPS
AS YOU CAN."
440 PRINT "IF THE ENEMY SHIP RE
ACHES THE "
450 PRINT "END OF THE RUNWAY, Y
OU WILL BE"
460 PRINT "DEAD.YOU ONLY HAVE 0
NE SHIP."
470 PRINT "AFTER A WHILE THE EN
EMYS RUNWAY"
480 PRINT "WILL GET SHORTER.YOU
R CONTROLS"
490 PRINT "ARE: 6=DOWN,7=UP,0=FI
RE."
500 PRINT "YOUR SCORE DEPENDS O
N HOW FAST"
510 PRINT "YOU CAN SHOOT EACH S
HIP."
520 PRINT AT 13,11;"GOOD LUCK"
530 PRINT AT 21,5;"PRESS ANY KE
Y TO START"
540 IF INKEY$="" THEN GOTO 540
550 RETURN
560 SAVE "RUNWAY"
570 RUN

```

PASTA BLASTA

WHILE in an Italian restaurant you are attacked by the dreaded pasta pinchers. You have

to save the pasta by blasting the intruders, using 0. Use keys 1 and 2 for left and right.

Pasta Blasta was written for the 16K ZX-81 by Karl Gibson and Adrian Wilson of Tarporley, Cheshire.

```

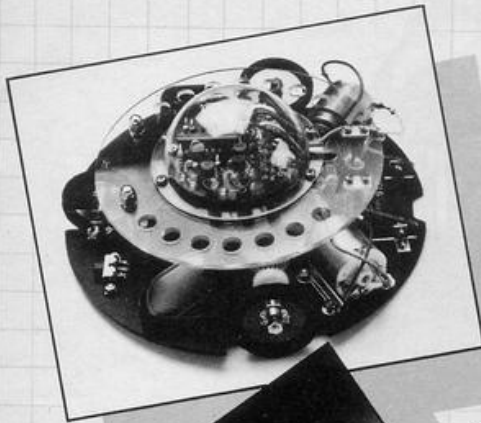
1  SAVE "PASTA"
2  GOTO 300
3  LET S=0
4  LET L=10
5  LET A=19
6  LET B=14
7  LET C=2
8  LET D=INT (RND*31)
9  LET A$=" <*> "
10 LET B$=" $"
11 PRINT AT 20,0;"
12
13 PRINT AT A,B;A$
14 PRINT AT C,D;B$
15 LET B=B+(INKEY$="2")-(INKEY
16 $="1")
17 IF C=21 THEN LET L=L-1
18 PRINT AT 21,0;L;" LIVES "
19 IF C=21 THEN LET C=2
20 IF L=0 THEN GOTO 170
21 PRINT AT C,D;" "
22 IF RND>.5 THEN LET D=D+2
23 IF D>31 THEN LET D=D-2
24 IF INKEY$="0" THEN GOTO 120
25 LET D=D-1
26 LET C=C+1
27 GOTO 60
28 PRINT AT C,D;B$
29 FOR G=18 TO 2 STEP -1
30 PRINT AT G,B+2;" "
31 IF G=C AND B+2=D THEN GOTO
32 127
33 PRINT AT G,B+2;" "
34 NEXT G
35 GOTO 60
36 LET S=S+50
37 GOTO 21
38 PRINT AT 3,0;"YOUR SCORE IS
39 ";S

```

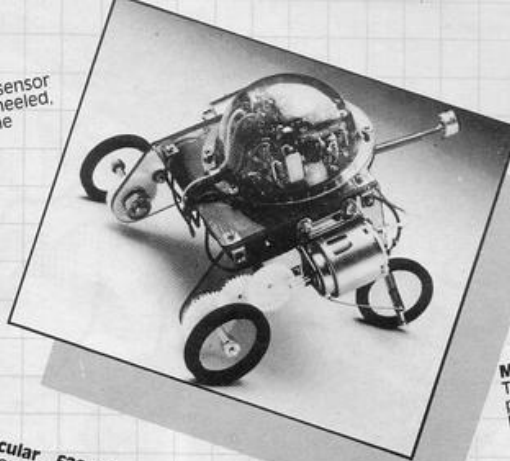
```

180 PRINT AT 10,0;"ANOTHER GAME
190 Y/N"
190 IF INKEY$="Y" THEN GOTO 2
200 IF INKEY$="N" THEN STOP
210 GOTO 180
220 CLS
230 PRINT
240 PRINT AT 10,7;"> **PASTA BLA
250 STA**<
260 PRINT TAB 5;"<<<<<-----
270 ---->>>>"
280 PRINT AT 15,7;"PRESS ANY KE
290 Y"
300 PAUSE 4E4
310 CLS
320 PRINT "LONG, LONG AGO IN AN
330 ITALIAN "
340 PRINT "RESTAURANT FAR, FAR A
350 WAY"
360 PRINT
370 PRINT "YOU ARE ATTACKED BY
380 PASTA "
390 PRINT "PINCHERS."
400 PRINT
410 PRINT "YOUR AIM IS TO BLAST
420 "
430 PRINT
440 PRINT "THE PASTA PINCHERS."
450
460 PRINT
470 PRINT "PASTA PINCHERS=$ "
480 PRINT
490 PRINT "YOU=<*>"
500 PRINT
510 PRINT "PASTA= "
520 PAUSE 4E4
530 CLS
540 GOTO 5

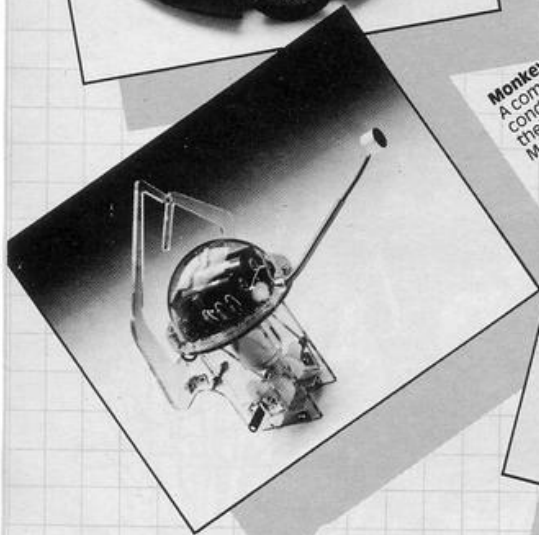
```



Line Tracer II £17.99
Draw a line and the infra-red sensor picks it up and sends this 3 wheeled, twin motored robot along the course you plot.



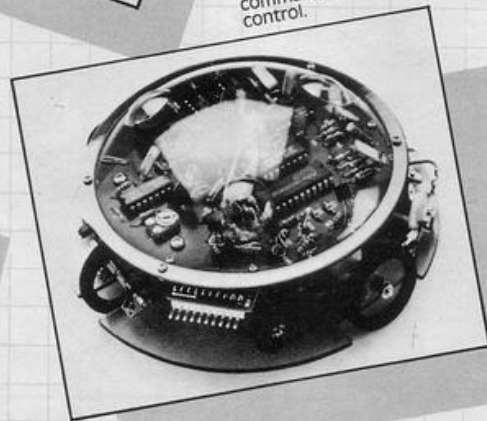
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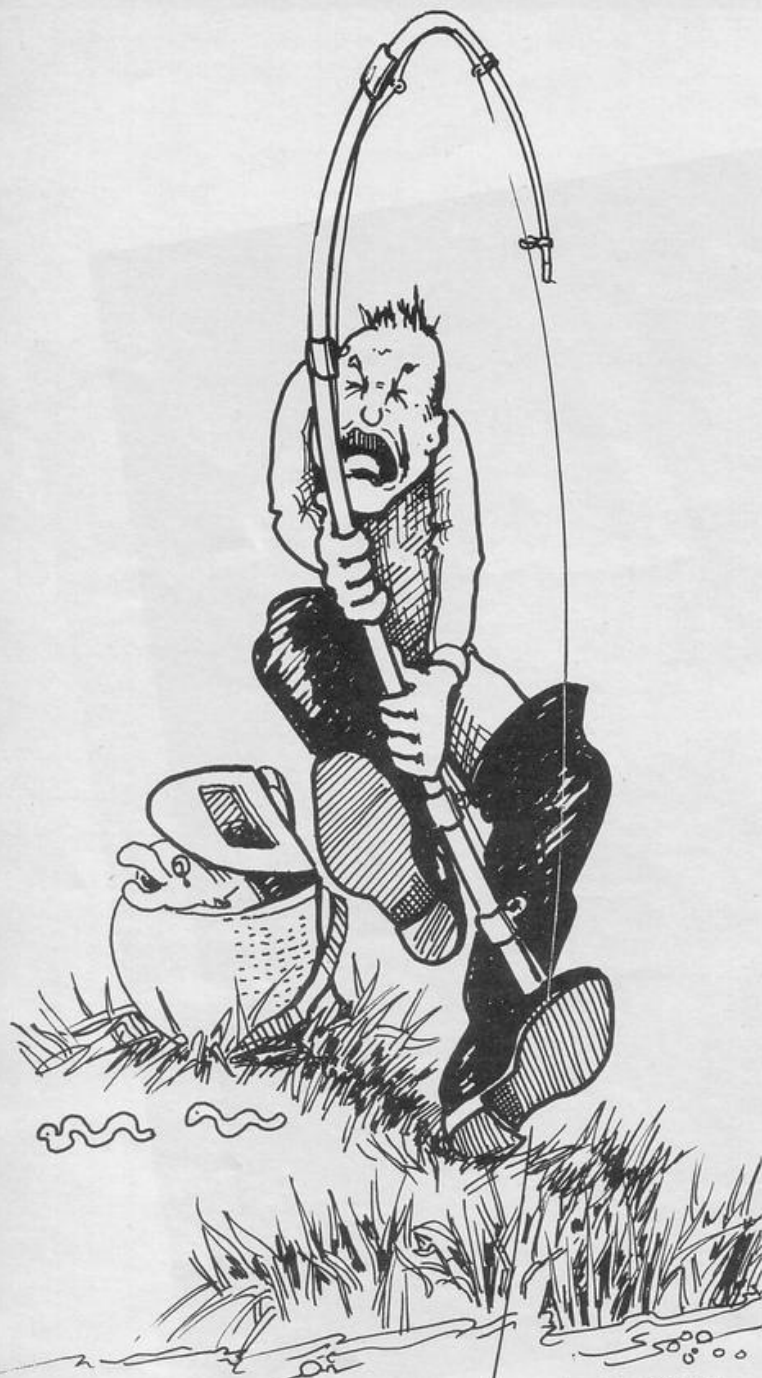
Please send me my MOVIT(S) straight away.
I enclose my cheque for £ _____ payable to Prism Consumer Products
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☐ MEMOCON CRAWLER @ £34.99 ☐ MONKEY @ £9.99
☐ CIRCULAR @ £29.99

SP/8/84

Enter number of MOVITS required in boxes above.
Allow 28 days for delivery. All prices include VAT.
Batteries not included. Dealer enquiries welcome.
Send your cheque to: **Movit Offer Prism Consumer Products**, Prism
House, 18–29 Mora Street, London EC1V 8BT.



FISHERMAN

USING keys 5 and 8 to move left and right, you play the part of a fisherman on a river bank. Judge the distance between yourself and the fish and then decide when to cast your line. You have 10 maggots, so be careful to waste none. If you move too near the edge of the river bank you will fall in and will then be seen slouching home.

Fisherman was written for the 16K ZX-81 by E J Mathews of Milton Keynes, Bucks.

```

115 GOSUB 230
120 PRINT AT 21,0;"FISH=";HC;TA
130 IF F=0 THEN LET X=X+1
140 IF F=0 THEN LET Y=Y+1
150 IF INKEY="C" THEN GOSUB 84
160 IF INKEY="C" AND F=0 THEN
LET F=1
170 IF F=1 THEN GOSUB 340
180 IF HC+HC=10 THEN GOTO 910
190 GOSUB 440
200 IF H=0 THEN GOTO 230
210 GOSUB 490
220 GOTO 40
230 PRINT AT Y,X;"-";
240 PRINT AT Y+1,X;"-";
250 PRINT AT Y+2,X;"-";
260 PRINT AT Y+3,X;"-";
270 PRINT AT Y+4,X;"-";
280 PRINT AT Y+5,X;"-";
290 IF INKEY="0" THEN LET X=X+
1
300 IF INKEY="5" THEN LET X=X-
1
310 IF X<0 OR X>24 THEN GOTO 80
320 IF X=0 THEN PRINT AT Y,25;"
";
330 GOTO 120
340 UNPLOT X,Y
350 LET Y=Y-1
360 PLOT X,Y
370 IF Y=2 THEN LET HC=HC+1
380 IF Y=2 THEN LET F=0
390 IF F=0 THEN UNPLOT X,Y
400 IF ABS(XD-2*XS-5)>6 THEN R
ETURN
410 IF YD<43-2*YS THEN RETURN
420 LET H=1
430 RETURN
440 PRINT AT YS,XS;">=";
450 LET XS=XS+AND
460 IF XS>27 THEN LET XS=0
470 IF XS=0 THEN PRINT AT YS,27
";
480 RETURN
490 LET HC=HC+1
500 FOR I=1 TO 5
510 PRINT AT YS,XS;"M";
520 PRINT AT YS,XS;"M";
530 PRINT AT Y+3,X;"M";
540 PRINT AT Y+4,X;"M";
550 PRINT AT Y+5,X;"M";
560 NEXT I
570 RETURN
580 FAST
590 FOR I=0 TO 31
600 PRINT AT 0,1;" ";
610 PRINT AT 0,1;" ";
620 NEXT I
630 SLOW
640 RETURN
650 FOR U=0 TO 5
660 PRINT AT U,0;" ";
670 NEXT U
680 PRINT AT 0,10;"YOU'VE FALLEN
";
690 FOR Y=0 TO 15
700 PRINT AT Y,X;" ";
710 PRINT AT Y+1,X;" ";
720 PRINT AT Y+2,X;" ";
730 PRINT AT Y+3,X;" ";
740 PRINT AT Y+4,X;" ";
750 PRINT AT Y+5,X;" ";
760 NEXT Y
770 CLS
780 GOTO 910
790 PRINT AT Y+3,X;" ";
800 PRINT AT Y+4,X;" ";
810 PRINT AT Y+5,X;" ";
820 RETURN
830 FOR U=0 TO 5
840 PRINT AT U,0;" ";
850 NEXT U
860 CLS
870 FAST
880 FOR I=0 TO 31
890 PRINT AT 21,1;" ";
900 PRINT AT 0,1;" ";
910 NEXT I
920 SLOW
930 FOR X=0 TO 20
940 LET Y=0
950 PRINT AT Y,X;"-";
960 PRINT AT Y+1,X;"-";
970 PRINT AT Y+2,X;"-";
980 PRINT AT Y+3,X;"-";
990 PRINT AT Y+4,X;"-";
1000 PRINT AT Y+5,X;"-";
1010 NEXT X
1020 IF X=20 THEN GOTO 1070
1030 CLS
1040 PRINT AT 10,2;"ANOTHER TRY?
(Y/N)";
1050 IF INKEY="Y" THEN GOTO 1
1060 IF INKEY="N" THEN PRINT "T
HE FISH AREN'T BITING ANYWAY"
1070 GOTO 1090
1080 PRINT AT 5,10;"FISHING"
1090 PRINT AT 7,7;"BY E.J.MATHEW
";
1100 PRINT AT 9,0;"YOU HAVE 10 M
AGGOTS TO TRY AND"
1110 PRINT "CATCH AS MANY FISH A
S POSSIBLE"
1120 PRINT
1130 PRINT "MOVE THE FISHERMAN U
SING KEYS"
1140 PRINT "5 FOR LEFT AND 8 FOR
RIGHT"
1150 PRINT "CAST WITH KEY C"
1160 PRINT "DONT GO TOO CLOSE TO
THE EDGE"
1170 PRINT "OF THE SCREEN THE BA
NK IS LOOSE"
1180 PAUSE 800
1190 RETURN

```

```

1 REM "FISHING"
2 GOSUB 1120
3 LET HC=0
4 LET H=0
5 LET XS=0
6 LET X=1
7 GOSUB 84
8 LET Y=INT (RND*5)+10
9 GOSUB 230

```


Solve building problems by demolishing a wall

LIKE MYSELF, I am sure many readers have been waiting for an item concerning problems with running the Builder program printed in the January, 1984 edition. The game shows all the potential of a first-class, arcade-type game with the exception that I found it to be technically impossible to win, due to the fact that the final ladder, in the bottom right-hand corner of the screen, was completely encased by walls and therefore a player could not exit to the next sheet.

Since nothing has appeared in the Errors and Mishaps column, which is an excellent service, I have had to find a solution and have arrived at these conclusions.

The data statement on line 9996 should have the first subsequent 19,29 deleted from it. That is the screen position of the wall which blocks the ladder.

When the offending wall has been removed, you will be able to leave the first screen but the computer will report INTEGER OUT OF RANGE when you do so. To clear that, both of the PRINT statements can be deleted entirely from line 9810, which does not affect the running of the program noticeably.

To improve the smooth running of the game you can add to line 9800:

PRINT AT 9,7; FLASH 0;
"PRESS ANY KEY"

That should be inserted immediately prior to the statement LET she=she+1, and has the effect of printing that message to remind players that another key should be pressed to continue, otherwise the computer just waits for a key-press before continuing with subsequent sheets.

A simple point which I am sure might have been missed by many people is the necessity to press "0" to pick up the picks and bonus. It took me a long time to spot that in the listing, since it is not specified in the magazine program heading.

There is still one flaw which I have been unable to solve and I would welcome a contribution from another reader. On the left side of the screen there is a short ladder going down to the first runaway pit-truck area, which can be descended from the level above, but for some reason the builder will not climb back to the higher level when necessary. It is a minor point but can be annoying when the monsters are close on your trail and grab you as a result.

I think Builder is an excellent program once debugged and would like to see more attention paid to this calibre of program which, to my way of thinking, is almost as good as commercially-produced material. The length of such programs does not have to be

a problem as I will often enter a program of this or greater length in two or three sessions, SAVEing and MERGEing each section as I go until completed.

R J Moore,
North Walsham, Norfolk.

Character change

I WOULD be interested to hear from readers with cheap software to sell — originals only, including manufacturer's inserts. I have also written a short program to change character appearances on the 48K Spectrum:

```
10 FOR f=-255 TO 255
20 POKE 23606,f
30 PRINT "abcdefg"
40 IF INKEYS="" THEN
NEXT f
```

It is interesting to alter line 30.

Daniel Hicks,
Sutton Coldfield,
West Midlands.

Spectrum games

A NEWLY-FORMED software company, No 1, is compiling a games tape consisting of 100 to 500 games. At the moment the games tape is available only for the Spectrum but it is hoped later to cover most of the popular computers. We still require several games, so if readers wish to send games which have been rejected by magazines we will print the names on the tape and at the start of

the program we will print the copyright. Copyright would remain yours. Cash is paid for the best games but your cassette will be returned only if you enclose a stamped-addressed envelope. The people who send a tape, whether accepted or not, will receive a discount of at least £2 on the price of the cassette.

We are hoping to market the cassette around August. The price will be £5-£7, or £3 for people who submit games. Send programs to the address below.

Matthew Brown,
22 Kings Hedges,
St Ives,

Huntingdon, Cambs.

Secure listing

I ENCLOSE a routine which will protect a program from unauthorised listing. Add it to the beginning of your program and if BREAK is attempted the rest of the program will be re-set:

```
110 POKE 23613,2
120 POKE 23614,91
130 POKE 23298,0
140 POKE 23299,0
150 REM PROGRAM
```

STARTS HERE

Simon Cree,
Guisborough,
Cleveland.

Successful mine

DANIEL Popplewell asked in the June edition of *Sinclair Programs* about the game Forty Niner from Software Farm. He asked if anyone had beaten his brother's score of 46,469. I have achieved a personal best of 55,575.

S Perry,
Hemel Hempstead,
Hertfordshire.

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

To: Sinclair Programs, 196-200 Balls Pond Road, London N1 4AQ.

I encloseProgram(s) for thecomputer.

I guarantee that each program submitted is my original work.

Signed

Name.....

Address.....

Good micro: shame about the games

Manufacturers reproach ZX-81 owners for lack of interest in buying programs. We look at software for the ZX-81 and its value for money

ZX-81 OWNERS have reason to be annoyed with the software industry. A cursory glance at computer magazines each month reveals ample signs of the 150 or so companies producing software for the Spectrum. Spectrum software supports entire magazines devoted to its reviews. So few ZX-81 games are produced that the entire computer press could be read for a month, without producing more than two pages of reviews, most of them of old products.

Software Farm took high-resolution graphics to the ZX-81 earlier this year with its **Forty Niner**. Half the letters to *Sinclair Programs* from ZX-81 owners that month were written in praise of the new game. The success of **Forty Niner** has not led to production of high-resolution graphics programs by other software houses and the field has been left clear for Software Farm to follow its success with its new program, **Rocket Man**, to be reviewed in the next issue.

Other companies are also producing good software for the ZX-81, although they are few and far between. *Sinclair Programs* has looked at some of the products on the market to see where the best programs are to be found.

Bears in the Wood from Unicorn Micro Systems is a good example of an original game for the 16K ZX-81. The player begins with a mother bear and three cubs which head across the screen towards their cave, collecting honey as they go. Of course, the little bears have a tendency to lose their mother and, as soon as they do so, they become prey to the evil hunters in the forest. Hunters must be charged, bears guarded, and the time limit watched. Once inside the cave, honeypots must be filled and there is a chance to gain an extra cub. Then the player returns to the forest.

Bears in the Wood is a difficult game at which to succeed and consequently holds the attention. The opportunity to

return to the forest more than once can be attained only with a sound knowledge of the scoring system and a variety of tactics which keep mother and cubs united with plenty to eat. One small bug is that the mother bear can become blocked in a corner by the cubs, unable to move until one of them is shot by a hunter.

Climber, also produced by Unicorn, is much less enjoyable. It is a version of **Kong** in which the player must climb from level to level on one screen, jumping the monsters and picking-up points on the way, and finally moving to the next screen by reaching the appropriate point on the top level.

Does not adapt well

Kong is not a game which adapts from arcade to ZX-81 particularly well, as much of its interest relies on speed and good graphics.

This version is not particularly difficult, once the movement of the various obstacles has been understood, but it is very repetitive.

A style of game more suited to the ZX-81 is represented by **Ocean Trader** from Quicksilver. It is a form of simulation in which the player takes the part of a ship's commander, sailing from port to port round the coast of England.

Prices of commodities in the ports change from day to day and from place



to place and the aim is to profit by buying goods in one port and selling them for a profit at the next.

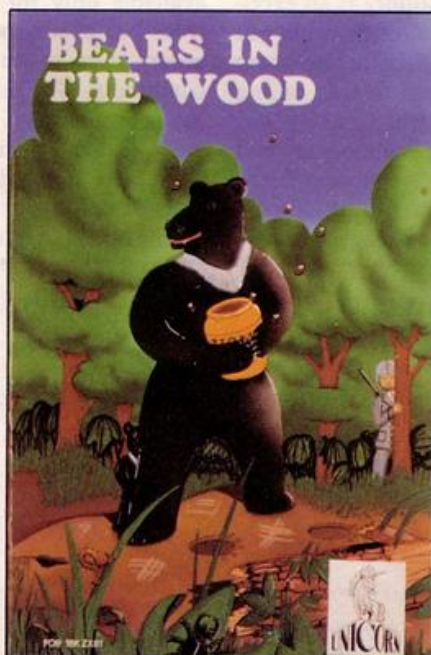
The game is rather slow-moving, taking some time to display options or to print details of prices. This type of game, though, is well-suited to the ZX-81 and this is a well-thought-out example.

Black Star from Quicksilver has an impressive storyline printed on its cover. The story tells of the Cosmic Guerillas and of your plan to bomb their **Black Star** base in your **Svlegian Raider**. Enemy ships must be dodged and the energy ducts in the tunnel leading to the **Black Star** must be destroyed. All very impressive.

On **RUNning** the program, however, the tunnel proves to be a black rectangle, or sometimes a rectangle of asterisks. Immediate acceleration means that no enemy ships appear and, when your ship travels slowly enough to see them, they appear as small Vs at the bottom of the screen.

Similarly uninteresting is **Croaka Crawla** from Quicksilver, a version of the arcade oldie **Frogger**. According to this version **Frogger** has gained nothing in its old age and has lost much. There is a huge variety of skill levels, ranging from the very low to the ultra-fast but, other than that, the program has little to commend it.

QS Scramble from Quicksilver is yet another arcade adaptation. The player flies above the surface of a planet, firing at approaching aircraft and bombing those still on the ground. The game loses less than others from its adaptation to the ZX-81, perhaps because its interest is almost totally in controlling your craft. As the screen display changes continually the square graphics are less glaringly apparent than in games where the screen display remains constant.



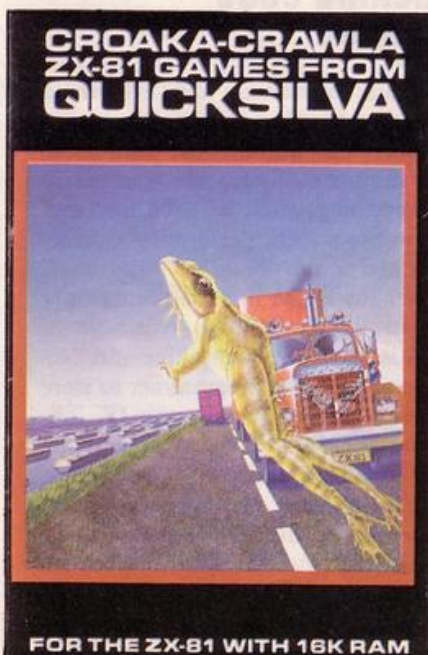
Arcade games can do little on the ZX-81 other than to demonstrate its weaknesses. The ZX-81 also has advantages which Psion has put to excellent use in its program **Vu-File**. Vu-File allows the user to store information on record cards, to re-arrange, sort, store and print that information. Unlike other filing systems it does not pre-define the index card but allows the user to design one. Information can then be entered into the computer and can be re-arranged according to any one of the headings on the record card.

A demonstration program on the B side of the cassette demonstrates one use to which the program can be put. A gazetteer has been recorded, including basic details about a number of countries. The program can be used for reference or taken as an example by those who want to test the efficacy of Vu-File before entrusting their records to it.

Inexpensive programs

Also reviewed by *Sinclair Programs* were programs from two small companies which produce inexpensive programs on a mail order basis. They give some idea of the quality of programs sold through magazine small advertisements, rather than those produced by large companies.

Swag is produced by Howard Software, 20 Pantycelyn, Fishguard, Dyfed and costs £3.45. In it the player takes the part of a burglar who wishes to rob a bank. The first section is a street chase, in which the player navigates a car through a maze, pursued by two police cars which move more slowly. Speed is slow and it is easy to avoid the police.



Section two takes place inside a building. The aim is to walk into each of three rooms, pick up treasure and return it to your lorry outside the building. The problem here is to avoid the forcefields on the doors. As they appear to flash in a completely arbitrary fashion it is difficult to use any skill in that section. Section three is combined with section two. The treasure in room two is inside a safe with a combination lock and the combination must be cracked quickly before the alarms ring.

Overall the pace of **Swag** is slow and the game unexciting. It would keep few players interested for as long as half an hour; most would lose interest more quickly.

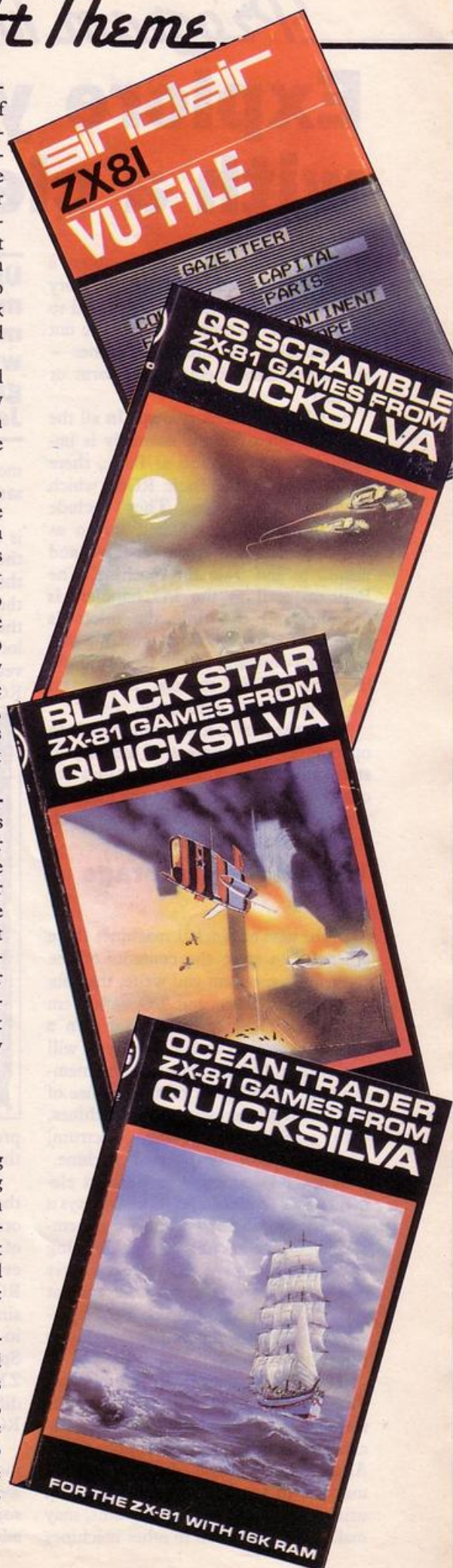
Bank Raid is from Senior Software, 8 The Elms, Shaw, Swindon. Again the theme is bank robbery, this time with an emphasis on shoot-outs. A maze is printed on-screen and the player must escape the two gunmen who are out to kill. On the next screen the tables are turned and this time it is the player who must shoot the gunmen before they escape. The next screen returns the player to the beginning to escape again, and so it continues. Again, the game is deadly slow and lacks the excitement necessary to a maze game.

Also from Senior Software is **Allotment**, a utility program for gardeners planning how to allocate space in their vegetable gardens or allotments. The program works on a three- or four-year crop rotation system and divides the vegetables which it has stored in it accordingly. On a diagram of the allotment vegetables chosen by the gardener will be placed automatically at the correct distance from each other, so that the number to be planted is readily apparent.

Essential add-ons

Allotment is an easy way of planning a garden to advantage, of recording where vegetables are planted and when they are likely to appear. A large number of vegetables and information about them is stored in the data section and gardeners who prefer to plant exotic plants can include their own data.

Available by mail order also are essential add-ons for the user on a limited budget. Glaston Computers, Yallands Hill, Monkton Heathfield, Taunton, Somerset produces clear, self-adhesive plastic pads which can be stuck on to the keys of a ZX-81, or only on to those keys used for games playing. Forty pads cost £2.99 and they make the ZX-81 keyboard usable for games or for typing.



Explore your computer with a clear memory map

WHEN LEARNING about a computer, the words memory map, system variables and so on are bound to crop up. They are not exceptional to the Sinclair machines — all micros have them in one form or another.

So what is a memory map? In all the common micros, Basic normally is implemented and, as well as Basic, there are sections of the Basic ROM which perform other tasks. They include handling the keyboard and screen as well as printer and any other input and output to and from the machine. The Basic as well as the I/O handlers is operating all the time the micro is switched on, even when you are not running a program. So the Basic and I/O handlers are, in essence, a program which is running constantly.

All programs need data on which to operate, as well as areas of memory to store information which may or may not change. That area is called the memory map and is divided into sections which store different types of data.

Working and storage space

In the case of Sinclair machines there are areas to store the contents of the screen, the program you write, the data area for the Basic and I/O — system variables — and so on. If you own a Spectrum as well as a ZX-81, you will notice from the manuals that the memory map is similar in parts. Because of that, I will be discussing both machines, with a bias towards the Spectrum, which is a more complicated machine.

When programming in Basic at elementary or advanced level, it is always a good idea to understand how the memory map of the micro is set up. Learning about memory maps allows for a greater understanding of the machine and, at Basic level, you can by-pass many operations, thus allowing your programs to run faster.

There is a danger in doing that. PEEKing and POKEing about the memory map can easily crash the machine, as there is no error-checking. Also, memory maps differ from one machine to another and, depending on using them within your programs, may make the progression to other machines

Understanding the memory map of your machine allows you to write much faster programs in Basic. David Janda explains how.

more difficult, so use them when necessary and not as a matter of course.

On the Spectrum, the start of RAM is at location 16384 and that is true of the ZX-81. Simple arithmetic tells us that there is 16K worth of addresses on the ZX-81 before the RAM starts, yet there is only 8K of ROM. PEEKing the locations above the 8K ROM area reveals that there is a 'shadow' copy of the ROM. That area cannot be used by the



programmer but some add-ons can use the area effectively.

When the 16K ROM was written for the Spectrum, not all the code was original — the 16K ROM is a re-write of the 8K ROM on the ZX-81. That is evident as there are parts of the 16K ROM which are not used but were simply left there. Many of the routines in the ZX-81 ROM are also used on the Spectrum and if you have studied the ZX-81 ROM you will not find it too difficult to progress to the Spectrum ROM.

Basic and the I/O routines — or monitor — were mentioned as if they were both separate. In reality that is not so, as they are all mixed. On more advanced machines, the Basic and the

operating system are physically different, with the advantage that other languages can be implemented without too much difficulty. The problem is that both the Basic and operating system will take more room than if they were combined. So when you hear references to the monitor or operating system, it usually means the routines are not directly part of the Basic interpreter.

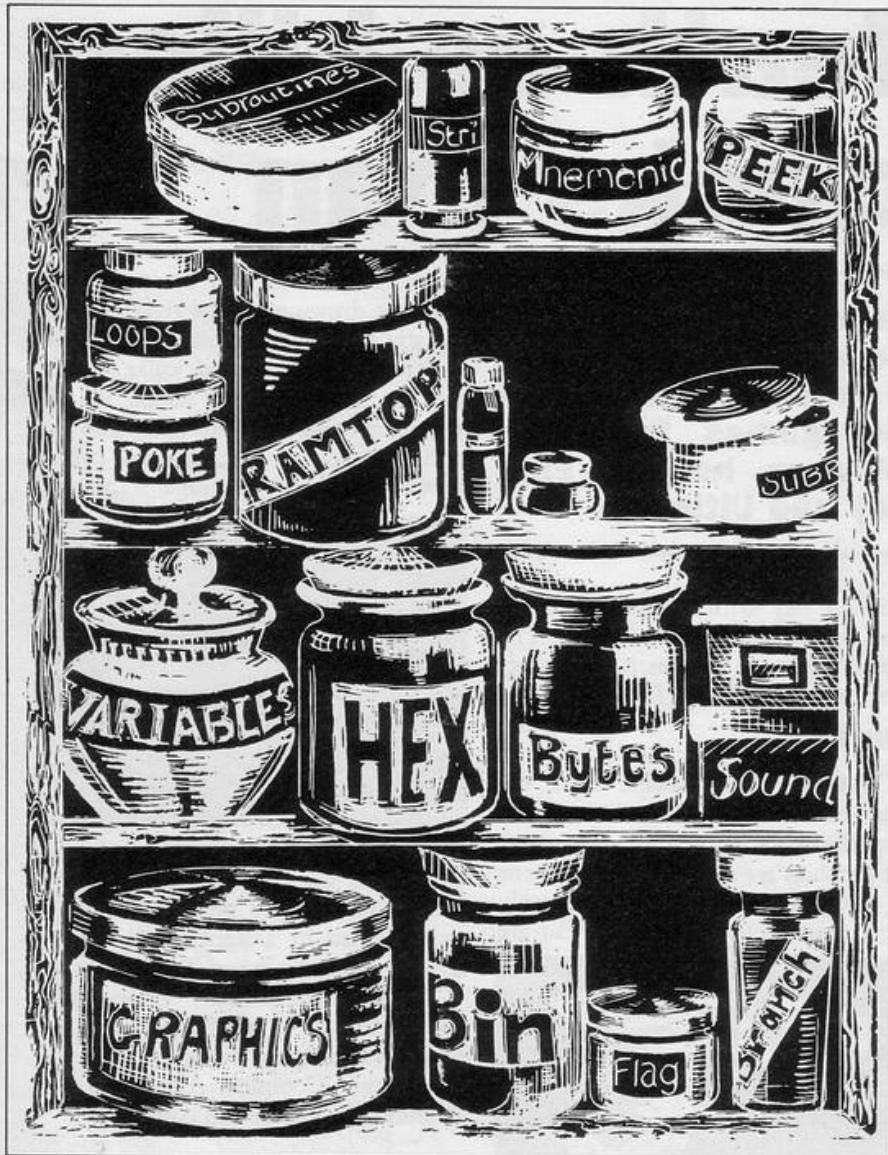
In the ROMs of the ZX-81 and Spectrum are hundreds of small machine code routines which perform individual tasks. Alone they may not do much but when some are combined they can do big jobs, such as adding two numbers. Many routines are used by different parts of the ROM and that is why the ZX-81 and Spectrum ROMs are sometimes referred to as threaded code interpreters. An example is how numbers are handled. Even when you specify a number as being an integer — a whole number — it is still processed by the floating point routines — there are no integer routines — and, at the end of the calculation, the number is converted back to an integer.

The fact that there are routines which handle several jobs, as well as the fact that all numbers are treated as floating point, contributes to why the ZX machines are not the fastest on the market.

Machine code routines

Because the routines to do everything are packed together, machine code programmers can utilise those routines in their programs. There are routines to do everything, such as printing numbers to the screen, performing calculations, and so on.

After the ROM there is the memory map in RAM, not that that area of RAM is used by the machine and cannot be used by the programmer to store programs. Unfortunately, the 1K ZX-81 and the 16/48K Spectrum do not allow you to use all the memory, because the memory map takes a portion. In the case of the ZX-81 it is a minimum of 125 bytes and for the Spectrum a minimum of 7.17K. I say minimum because there are areas which use no room until a program is running. They



are the machine stack, GOSUB stack, program variables and others.

To the newcomer, the need for memory to be reserved for the display is a little confusing; after all, it is the screen which is used for the display and not the computer. That is true but the screen displays all the previous data you send to it and not just one character. It is best to imagine the display file as a buffer which holds all the data for the screen. When it is filled, or when a PRINT/PLOT command is issued, the ZX-81 or Spectrum pushes that information to the television set.

The display files for the Spectrum and ZX-81 are radically different, with the ZX-81 display file the easiest to understand. To save memory, the ZX-81 display file will expand and contract as required. That saves room for machines with only 1K. Those with the 16K expansion have the display file fully expanded.

Poking to the screen is not impossible, even though the display file is not at a fixed position. To poke the letter

'H' on the fifth column of line zero means that the start address has to be found and five added to it. The system variable D_FILE — address 16396 — holds that start position so, POKE (PEEK 16396+256*PEEK 16397)+5,45 will do the trick. For unexpanded users, it is necessary first to ensure that the area to be poked is already expanded. That can be done with spaces.

The Spectrum also has a display file — addresses 16384-22528 — but there is also an area of memory directly associated with it. That is the attributes area, which is at addresses 22528-23296. Both the display file and the attributes area are at fixed addresses and thus cannot be moved about in memory.

The first thing to note about the display file on the Spectrum is that it is more than 8K long. The reason is that the display file not only holds characters but also high-resolution graphics. It is set up in such a way that each row — high resolution — is made up of 32 bytes. There are eight bytes to each

character and 22 rows, plus two for the report lines.

Poking characters to the Spectrum display is very difficult. Each character is made up from eight bytes, not like the one-byte ZX-81 set-up. If characters are to be printed in machine code, it is best to use the RST 10 instruction, which will print a whole character.

Each bit of every byte in the display file corresponds to one pixel being plotted on the screen. Note that it has nothing to do with the colour or other attribute the character/pixel may have.

The information as to foreground/background colour and so on is held in the attribute area. That area is smaller than the display file and each byte corresponds to one character position on the screen. Depending on the bit pattern of the byte, certain attributes will be assigned to the corresponding character position.

As there is one attribute byte corresponding to a character and not a pixel, no individual pixel may have its own attribute. That is the reason each character may have only one foreground and background colour.

Characters and graphics

The program area is where your program is stored. On the ZX-81 it starts at a fixed location — 16509 — and that allows machine code to be stored in REM statements at the start of the program. For the Spectrum things are different — the Microdrive maps and channel information are flexible. That means that with an Interface 1 attached, the start of program area cannot be guaranteed. That is a little white lie — the start of the Basic program area can be determined by $START = PEEK 23635 + 256 * PEEK 23636$. That is PEEKing the system variable PROG.

Readers who own computers other than the ZX-81 or Spectrum may have noticed that a program for one machine takes more room when put on a Sinclair machine. That is because all numbers in listings are followed by an invisible five-byte floating point representation.

Immediately above the program area on both machines is the variables area. The values of the variables in your programs are stored. As a program is run, variables are created and accessed and that makes the area one of the busiest. Programs can be made to run more efficiently if arrays to be used in a program are dimensioned before any other variables. After the arrays, declare the numeric variables, with the most-frequently-used declared first.

Duel to death as killer parrot attacks man

SABRE WULF sends the player rushing round a lusciously-flowered maze-like forest in search of the four portions of an amulet which will allow escape. On the way are superbly-animated creatures to be killed or avoided and an assortment of objects and treasure to be collected.

As with Atic Atac from the same company, a joystick is almost essential to any progress in the maze. Each location is packed with lethal creatures and as fast as one set is killed, another set appears. Stay in any place for any length of time and the lethal, indestructible voodoo flame will get you.

There is a choice of objectives. A percentage at the end of each game indicate how much of the maze you have covered; a score at the top of the screen registers most events, including monsters killed and, of course, there is the ultimate goal-escape.

Apart from the obvious problems posed by an intricate maze and deadly creatures, there are tactics to be learned which can help the player to success. Each object collected has a use, although they are difficult to deduce, and even working-out which of the several objects collected has provided an extra life can be difficult.

There are the orchids which bloom occasionally. One sends your movements haywire, another moves you super-fast, a third transforms you into a



zombie. Some are essential to progress, others should be avoided completely.

Then there are the pieces of amulet. They move round, so have to be re-discovered in each game. Next there are the knights in armour, and the fruit bats, and the wart hogs, the tarantulas, the killer parrots—and so it goes on.

If you like Atic Atac, you will love **Sabre Wulf**. If you missed Atic Atac,

We look at the best and the worst new releases in a month which offers new games from top software houses Fantasy and Ultimate.

rush and buy both games now. Produced by Ultimate Play the Game, The Green, Ashby de la Zouch, Leicestershire, Sabre Wulf costs £9.95.

Mugsy

NICE GRAPHICS, shame about the game. Never has that been truer of a Spectrum game than it is of **Mugsy**. The graphics are superb—many screens full of cartoon pictures, drawn quickly and in great detail. Some of them are



animated and the large-scale animation is better than any produced for the Spectrum so far.

The game, however, is a straightforward simulation in which the aim is to run a mob of gangsters for as long as possible. Decisions to be made are concerned with allocation of budget and little else.

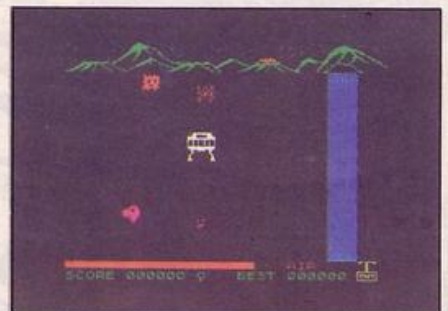
At first sight the game is astounding; within 10 minutes the graphics have become stale and the game is boring. What a shame. Produced by Melbourne House, Church Yard, Tring, Herts for the 48K Spectrum. Price, £6.95.

Tribble Trouble

TRIBBLE TROUBLE is a five-screen game and by the time you finish the fifth screen you will wish you had never heard of tribbles. It is not that they are not cute; it is just that they are dumb and it is difficult enough to finish an

appointed task without having to prevent one drowning in the river or walking straight into the hands of a monster.

Start the game and one walks straight into the river. The next tribble follows you obediently into your spaceship but will sit there quietly while you collect jewels and build a bridge across the



river? You bet it will not. When finally you escape the first screen, what happens? Your tribble gets caught on a cactus, eaten by a Spheroid, or walks straight into a Snapper. Typical.

Tribble Trouble is exasperating and great fun. It is produced for the 48K Spectrum by Software Projects, Bear Brand Complex, Allerton Road, Woolton, Liverpool and costs £5.95.

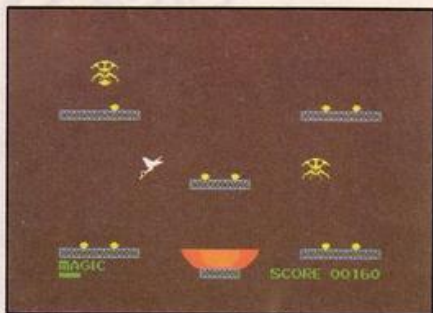
Egg Snatchers

RECENT software releases have indicated that shooting in straight lines is now passé. The new alternative is to spit missiles which hit their target on the ricochet. Not the cleanest of habits and certainly not the easiest.

That form of defence is employed in **Beaky and the Egg Snatchers**. The game includes many levels, all different. The gist is that the player is transformed into a large bird trying to rear chicks. Eggs must be collected and hatched and chicks must then be fed.

As usual, the difficulties are manifold. You are not just a bird, you are an Andromedan Condor. The instructions suggest that life is made easier if you imagine you really are an Andromedan Condor. That is no mean feat but they are correct; movement is even more difficult than that stretch of the imagination.

It might be thought that trying to incubate eggs would be difficult if you are a male bird but the problem goes



unnoticed in the face of the Egg-snatchers which do their best at every stage of the game to prevent any new condor reaching maturity. Not only do they carry away the eggs, they also drop snowflakes on the eggs while they are incubating and fire missiles at the small chicks.

Beaky and the Egg Snatchers is far more inventive and far more challenging than it is possible to imagine without playing it for several hours. Definitely one of the best games of 1984, produced for the 48K Spectrum by Fantasy Software, Fauconberg Lodge, 27a St George's Road, Cheltenham, Gloucestershire. Price, £6.50.

Eric and the Floaters

ERIC and the Floaters is a very addictive game, involving moving round a maze, exploding sections of wall to collect treasure and finding the exit to another screen. Points can be gained slowly by collecting treasure, or quickly by bursting the deadly floating balloons as soon as possible and moving to the next more difficult level. Enjoyable though it is, the fact remains that it is a monsters-in-the-maze-type game. Sinclair software used to be state of the art, so why is the company now endorsing products which could have been produced early last year?

Produced for the 48K Spectrum by Sinclair Research Ltd, 23 Willis Road, Cambridge Price, £5.95.

Carpet Capers

IN THE sophisticated Spectrum software market it is not often a game populated by unanimated user-defined graphics retains the user's attention for more than a few minutes.

Carpet Capers, billed as a game 'about deranged carpet fitters', does just that. The player rushes round the screen—a joystick is almost essential—lays as much carpet as possible, picks up the key and any tools lying around, and finds the door to the next room which the key unlocks.

To make matters more difficult, your

apprentice undoes all the good work, if you let him; other carpet fitters are laying carpet over yours and you cannot tread on your own carpet. There are nine rooms to complete and each one is a challenge.

Produced by Terminal Software, 28 Church Lane, Prestwich, Manchester. Price £5.95.

Bugaboo

IN BUGABOO—48K Spectrum, £6.95—the player takes on the persona of **Bugaboo** the flea, which must leap out of a pit, from pit to pit and from mushroom to mushroom while avoiding the horrific monster which wishes to eat Bugaboo. The novel movement of short and long jumps disguises for some time



the point that it is a clever development of the monster-in-the-maze game.

Produced by Quicksilver, 13, Palmerston Road, Southampton SO1 1LL.

Dragonsbane

DRAGONSBANE—48K Spectrum, £6.95—is one of those awful amalgamations of adventure and strategy game which become disenchanting within a few minutes of loading. The aim is to make your way through the castle, past the deadly monster, to rescue the princess. Only one room is displayed at a time and, even with careful use of a map, it is difficult to do anything other than trust to luck, as fleeing from monsters can transport you magically over some distance.

Dragonsbane should be re-named Userbane and is definitely not recommended. Produced by Quicksilver, 13 Palmerston Road, Southampton SO1 1LL.

Computer Cook Book

THE COMPUTER Cook Book by Bug Byte would merit an entry in the computer press pseudos corner if there were such a thing. To use it properly you must search your cupboards to see what ingredients you have available, carry the television set cassette recorder and com-

puter into the kitchen, set them up, load the database program, select your chosen recipe, load the recipe program and then cook.

Cook, that is, if you have room among the electrical equipment then cluttering your work surfaces. Most of it is also irrelevant if you follow any kind of special diet. Bug Byte seems to be implying that it is easier to go to all that trouble than to flick through your favourite recipe book but it is not.

Produced for the 48K Spectrum by Bug-Byte Ltd, Mulberry House, Caning Place, Liverpool, price £9.50.

The inferno

THE INFERNO is an adventure game with an ambitious theme, a screen layout similar to that employed in *The Hobbit*, and a character with whom conversations can be held in much the same way as they can be with Gandalf in *The Hobbit*. The scenario is the 13th century European image of hell, through which the player must travel to escape. Unfortunately the adventure is too easy. The first seven rings can be crossed quickly with the aid of the help facility and there is little difficulty in visiting every location and collecting all necessary objects.

Produced for the 48K Spectrum by Richard Shepherd Software, Elm House, 23-25 Elmshott Lane, Chippenham, Slough, Berkshire, **The Inferno** costs £6.50.

Zipper Flipper

IN YOUR local toyshop, in the novelty section, is a pile of little plastic gadgets which simulate the working of a fruit machine. **Zipper Flipper** does the same thing on a 48K Spectrum. The bouncing pinball is very well represented and is obviously the work of skilful programming. When all is said and done, though, the plastic gadget in



the toyshop does the same job more cheaply.

Published by Sinclair Research Ltd, 25 Willis Road, Cambridge Price, £5.95.

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Dept SU

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HYDE TERRACE, LEEDS LS2 9LN



YOU PLAY the part of the hero, Vanhelsing, and must kill the bats attacking the victim. As the bats swoop you have to throw crucifixes at them using key "F".

Vanhelsing and the Vampires was written for the 16K ZX-81 by S Martin, Newcastle-upon-Tyne.

```

1 PRINT AT 5,5;"DO YOU WANT I
NSTRUCTIONS?" (Y/N)
2 PAUSE 200
3 IF INKEY$="N" THEN GOTO 9
4 IF INKEY$="Y" THEN GOTO 155
9 CLS
10 LET P=1
11 LET S=0
12 LET B=2
13 LET A=0
15 LET B=16
16 LET Q=2
20 LET M=INT (RND*20+5)
25 GOTO 65
40 PRINT AT P,M;" ";AT
P+1,M;" ";AT P+2,M;" ";AT
";AT P+3,M;" "
45 LET P=P+1
50 PRINT AT P-1,M;" "
55 IF P>16 THEN LET P=1
60 IF P=1 THEN PRINT AT B,M;"
";AT B+1,M;" ";AT
B+2,M;" ";AT B+3,M;" "
61 IF P=1 THEN LET M=INT (RND*
20+3)

```

```

65 PRINT AT 0,0;"SCORE=";S
70 PRINT AT 19,M+2;"O";
75 PRINT AT 20,0;" "
80 PRINT AT 19,0;" "
81 IF A=10 THEN GOTO 500
85 PRINT AT 15,0;"O";AT 16,0;"
";AT 17,0;" ";AT 18,0;" "
90 IF INKEY$="F" THEN GOTO 40
95 IF INKEY$="F" THEN GOTO 100
100 FOR K=2 TO 28
105 PRINT AT B,0;" "
110 PRINT AT B,0;" "
115 LET Q=Q+1
120 IF P=B AND Q=M THEN LET S=S
+1
130 IF Q>28 THEN LET Q=2
135 NEXT K
136 LET A=A+1
145 GOTO 40
150 SAVE "VAMP"
155 CLS
156 PRINT AT 1,5;"VAMPIRES ATTA
CKING A MAIDEN"
160 PRINT AT 2,2;"IN THIS GAME
YOU ARE "
165 PRINT AT 3,2;"VANHELISING. T
HE VAMPIRE"
170 PRINT AT 4,2;"BATS ARE ATTA
CKING A MAIDEN"
175 PRINT AT 5,2;"YOU MUST THRO
W YOUR CROSSES"
180 PRINT AT 6,2;"AT THEM USING
KEY "F"
185 PRINT AT 7,2;"YOU ONLY HAV
E 10 CRUCIFIXES"
186 PRINT AT 8,2;"TO FIGHT THE
BATS OFF."
187 PRINT AT 9,2;"YOU MUST HIT
THE BAT IN THE HEAD TO
KILL IT"
190 PRINT AT 11,9;"*GOOD LUCK*"
195 PAUSE 500
200 GOTO 9
500 CLS
505 IF S=10 THEN PRINT AT 1,5;"
WELL DONE VAN HELSING YOU W
IN... THIS TIME..... BUT I
WILL RETURN"
510 IF S<10 THEN PRINT AT 3,5;"
THIS TIME VAN HELSING .....YOU
LOSE."
515 PRINT AT 5,5;"DO YOU WANT T
O TRY AGAIN?" (Y/N)
518 IF INKEY$="Y" THEN GOTO 518
520 IF INKEY$="Y" THEN GOTO 9
525 IF INKEY$="N" THEN GOTO 527
527 IF S=10 THEN GOTO 540
530 IF S<10 THEN PRINT AT 14,15
";AT 15,15;"O";AT 16,15;"
";AT 17,15;" ";AT 18,15;" "
532 PAUSE 100
534 PRINT AT 15,15;" "
535 PRINT AT 14,15;" ";AT 15,
15;" ";AT 16,15;" ";AT 17,15
";AT 18,15;" "
540 FOR H=1 TO 20
545 LET A$=" "
550 PRINT AT 10,12;A$
555 LET B$=" "
560 PRINT AT 10,12;B$
565 NEXT H

```


Inter

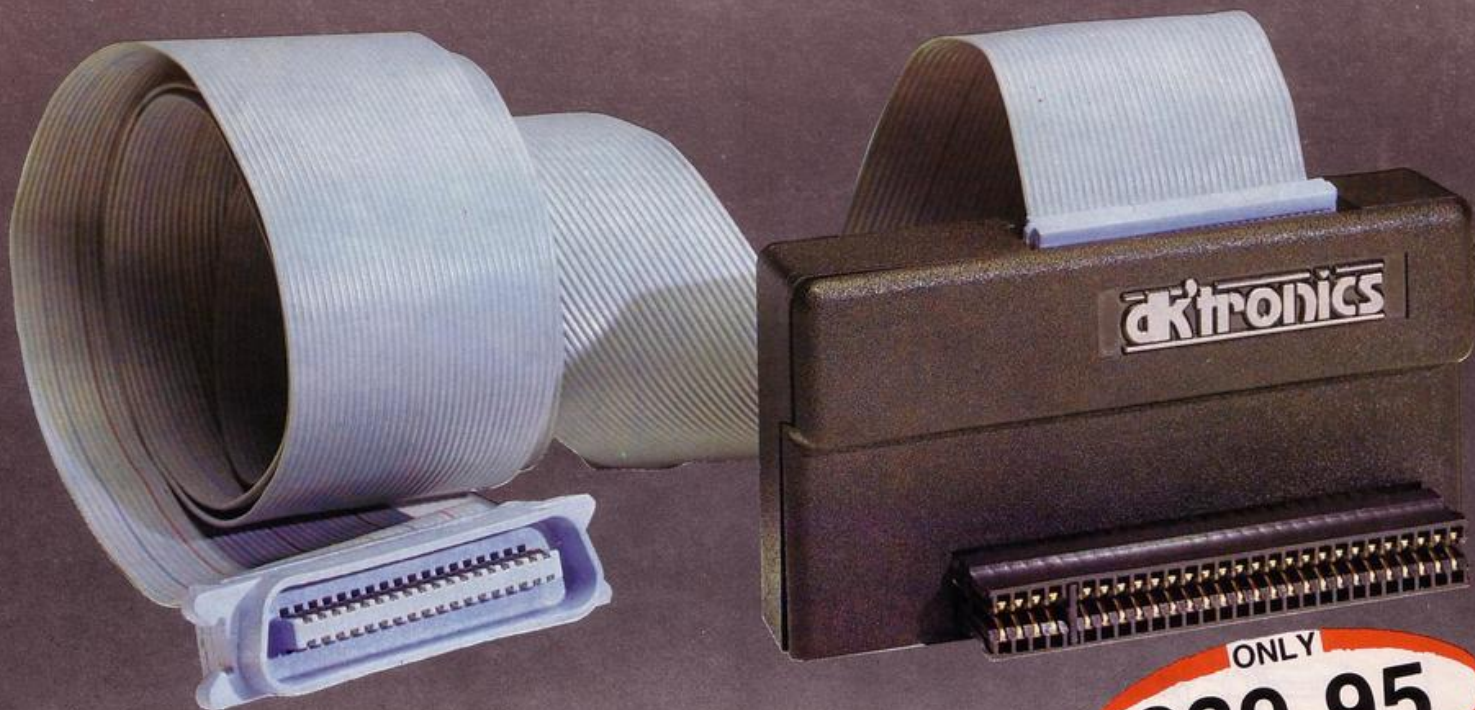
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GHOST MONSTER

THE LEADER of the ghost monsters has sent you on a secret mission to find the munchies' power forest. You have completed that task and must make your way back to headquarters. There are several patrols you have to pass to reach HQ. Wait for a convenient moment and slip into line in the patrol until you reach the next exit.

Ghost Monster was written for the 16K Spectrum by Martin Walker of Rugeley, Staffordshire.

```

200 FOR a=USR "a" TO USR "d"+ W 0,-20: DRAW -255,0: DRAW 0,20
7
210 READ udg: POKE a,udg
220 NEXT a
230 DATA 60,126,255,255,255,255
,126,60
240 DATA 60,126,248,240,240,248
,126,60
250 DATA 60,126,31,15,15,31,126
,60
260 DATA 60,126,90,219,255,255,
219,137
270 BORDER 6: PAPER 6: INK 9: C
LS
280 PRINT AT 0,10;"GHOST MONST
ER"
290 PRINT AT 6,13;"KEYS: -"
300 PRINT AT 9,12;"P = RIGHT";
AT 11,12;"I = LEFT"; AT 13,12;"
Q = UP"; AT 15,12;"Z = DOWN"
310 PRINT AT 18,5;"PRESS ANY K
EY TO PLAY"
320 PLOT 35,20: DRAW 176,0: DRA
W 0,15: DRAW -176,0: DRAW 0,-15
330 PAUSE 0: FOR n=1 TO 14: REA
D a: BEEP .1,a: NEXT n
340 DATA 5,5,12,12,14,14,12,10,
10,9,9,7,7,5
345 LET hi=0
350 CLS
380 LET sc=0: LET li=3
390 LET a=19: LET b=16
400 LET c=INT (RND *30)+1
410 LET d=INT (RND *30)+1
420 LET e=INT (RND *30)+1
430 PRINT AT 1,1;"SCORE ";sc;
AT 1,13;"LIVES ";li; AT 1,24;"HI
";hi
440 PLOT 0,175: DRAW 255,0: DRA
W 0,-20: DRAW -255,0: DRAW 0,20
450 LET a$=" C C C C C C
C C C C C C "
460 LET b$=" B B B B B B
B B B B B B "
470 PRINT AT 3,0; INK 4;"AAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAA
"
480 PRINT AT 7,0; INK 4;"AAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAA
"
490 PRINT AT 11,0; INK 4;"AAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAA
"
500 PRINT AT 15,0; INK 4;"AAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAA
"
510 PRINT AT 3,15; FLASH 1;"H"
; AT 4,15; FLASH 0;" "
520 PRINT AT 7,c;" "; AT 8,c;"
"
530 PRINT AT 11,d;" "; AT 12,d
;" "
540 PRINT AT 15,e;" "; AT 16,e
;" "
550 PRINT AT a,b;" "
560 LET a=a+(INKEY$="z" AND a
<19)-(INKEY$="q" AND a>0)
570 LET b=b+(INKEY$="p" AND b
<31)-(INKEY$="i" AND b>0)
580 PRINT AT 5,0; INK 1;a$; AT
6,0; INK 2;b$
590 PRINT AT 9,0; INK 2;a$; AT
10,0; INK 1;b$
600 PRINT AT 13,0; INK 3;a$; A
T 14,0; INK 2;b$
610 IF SCREEN$ (a,b)="" THEN
GO TO 670
620 PRINT AT a,b;"D": BEEP .05
,5
630 LET a$=a$(2 TO )+a$(1)
640 LET b$=b$(31)+b$( TO 31)
650 IF a=3 AND b=15 THEN GO TO
700
660 GO TO 550
670 PRINT AT a,b; FLASH 1;"D":
FOR a=0 TO 30: BEEP 0.05,a+5: N
EXT a
680 LET li=li-1: IF li=0 THEN
PRINT AT 1,19;"0": GO TO 720
690 GO TO 390
700 FOR a=-40 TO 50 STEP 4: BEE
P .02,a+10: BEEP .02,a-5: NEXT a
710 LET sc=sc+10: GO TO 390
720 PRINT AT 18,12; FLASH 1;"G
AME OVER": FOR a=0 TO 30: BEEP .
05,5: BEEP .05,2: BEEP .03,1: BE
EP .04,2: NEXT a
730 CLS
740 PRINT AT 0,10;"GHOST MONST
ER"
750 PRINT AT 8,10;"YOU SCORED
";sc
760 IF sc>hi THEN LET hi=sc
770 PRINT AT 10,3;"HIGHEST SCO
RE SO FAR IS ";hi
780 PRINT AT 12,7;"ANOTHER GAM
E [Y/N]"
790 IF INKEY$="y" THEN GO TO
350
800 IF INKEY$="n" THEN GO TO
820
810 GO TO 790
820 CLS: PRINT AT 0,0;"O.K..T
HANKS FOR PLAYING"
830 STOP

```


SEA RESCUE

LOWER your helicopter to the sea and rescue the man bobbing in the water. If you go too low you will crash into the sea and lose a life. After hooking the man from the sea you lower him on to the ship's landing platform before attempting another rescue.

Sea Rescue written for the 16K ZX-81 by Steven Knight of Nailsea, Avon.



```

1 LET B$="SEA RESCUE"
2 GOSUB 3000
3 LET HI=0
4 CLS
5 LET L=10
6 LET C=200
7 LET S=0
8 LET FU=150
9 LET B=15
10 LET D=1
11 POKE 16416,0
12 CLS
13 GOSUB 300
14 PRINT AT 23,0;"/"

```

```

40 PRINT AT 21,0;""
50 PRINT AT 20,0;""
60 PRINT AT 19,0;""
70 PRINT AT 18,0;""
80 PRINT AT 17,0;""
90 PRINT AT 16,0;""
100 PRINT AT 15,0;""
110 PRINT AT 14,0;""
120 PRINT AT 13,0;""
125 PRINT AT 22,0;""
140 LET D=INT (RND*2)+1
141 IF D=1 THEN LET B=B-1
142 IF D=2 THEN LET B=B+1
143 IF B<=16 THEN LET B=B+2
144 IF B>=25 THEN LET B=B-2
150 IF A$="" THEN PRINT AT 22,B
160 PRINT AT L-1,C-1;"";AT L
161 PRINT AT L+1,C+1;"";AT L
162 IF A$="0" AND L=10 AND C=4
163 THEN GOSUB 1150
164 IF INKEY$="7" AND L=20 AND
165 C=5-1 THEN LET A$="0"
166 IF INKEY$="8" THEN GOTO 200
167 IF INKEY$="7" THEN GOTO 204
168 IF INKEY$="8" THEN GOTO 208
169 IF INKEY$="5" THEN GOTO 212
170 IF L>20 THEN GOTO 1000
171 LET FU=FU-1
172 PRINT AT 2,26;FU;""
173 IF FU=0 THEN GOTO 1250
174 GOTO 125
175 FOR F=0 TO 3
176 PRINT AT F,0;""
177 NEXT F
178 NEXT F
179 PRINT AT 1,1;"";AT 2,2
180 PRINT AT 2,23;"";AT 2,23;"";SCD
181 RE="S,H,2,23;FUEL";FU
182 RETURN
183 PRINT AT L,C;"SPLASH";AT L-
184 1,C;"";AT L+1,C;""
185 LET LI=LI-1
186 PRINT AT 2,10;CHR$ LI
187 IF LI=156 THEN GOTO 1500
188 FOR Z=1 TO 100
189 NEXT Z
190 PRINT AT L,C;""
191 LET L=10
192 LET C=200
193 LET A$=""
194 LET FU=200
195 GOTO 32
196 LET S=S+1
197 PRINT AT 2,19;S
198 LET A$=""
199 LET FU=FU+20
200 RETURN
201 PRINT AT L,C;"CRASH";AT L-1
202 1,C;"";AT L+1,C;""
203 LET LI=LI-1
204 PRINT AT 2,10;CHR$ LI
205 PRINT AT 7,0;"YOU RAN OUT O
206 F FUEL"
207 IF LI=156 THEN GOTO 1500
208 FOR Z=1 TO 150
209 NEXT Z
210 PRINT AT 7,0;""
211 PRINT AT L,C;"";AT L-
212 1,C;"";AT L+1,C;""
213 LET L=10
214 LET C=200
215 LET A$=""
216 LET FU=200
217 GOTO 32
218 FOR F=1 TO 50
219 NEXT F
220 CLS
221 IF S>HI THEN LET HI=S
222 FOR F=1 TO 10
223 PRINT AT 5,10;"GAME OVER"
224 PRINT AT 5,10;"GAME OVER"
225 NEXT F
226 PRINT AT 10,5;"YOU LIFTED "
227 S;" MEN TO SAFETY"
228 PRINT AT 15,5;"HIGHEST IS "
229 HI
230 PRINT AT 20,10;"HIT N/L";""
231 TO PLAY AGAIN"
232 IF INKEY$="" THEN GOTO 1690
233 GOTO 4
234 GOSUB 2160
235 LET L=L+2
236 GOTO 190
237 GOSUB 2160
238 LET L=L-2
239 GOTO 190
240 GOSUB 2160
241 LET C=C+2
242 GOTO 190
243 GOSUB 2160
244 LET C=C-2
245 GOTO 190
246 PRINT AT L-1,C-1;"";AT
247 L,C;"";AT L+1,C+1;"";AT L
248 +2,C+1;""
249 RETURN
250 PRINT AT 3,2;""
251 PRINT AT 4,2;""
252 PRINT AT 5,2;""
253 PRINT AT 0,0;"";AT 1,1
254 PRINT AT 0,26;"";AT 1,
255 27;""
256 PRINT AT 10,6;"HOOK THE MEN
257 UP"
258 PRINT AT 12,7;"USING THE CU
259 RSOR"
260 AT 14,13;"KEYS"
261 FOR F=1 TO 150
262 NEXT F
263 RETURN
264 SAVE B$
265 RUN

```


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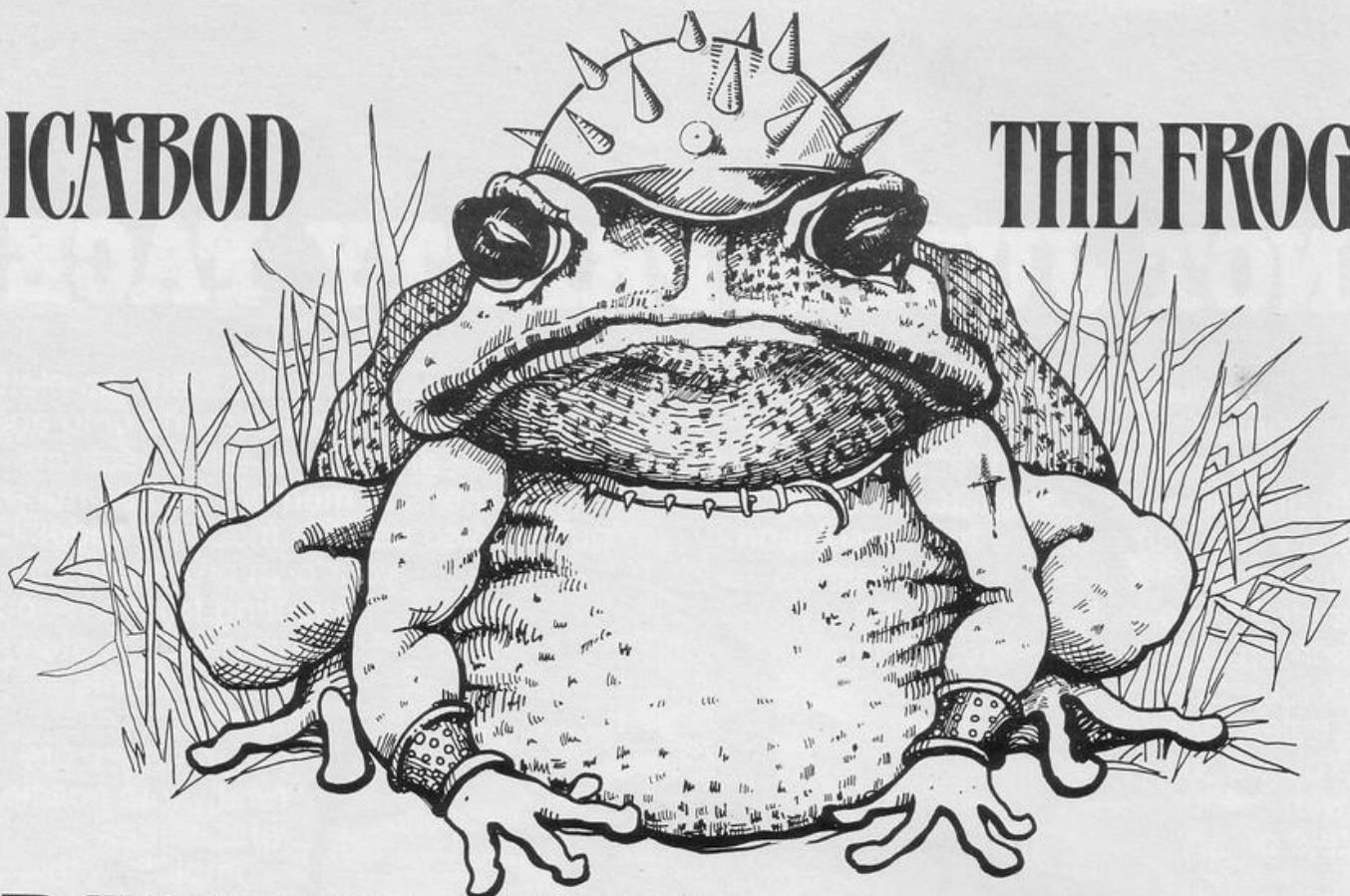
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ICABOD

THE FROG



DEFEND your spaceship from Icabod the Frog by hitting it 10 times with your laser gun. Your spaceship follows a fixed path and

at the beginning of the game you can choose the speed at which it travels. When Icabod turns red you have to hit it once more to proceed to the next level

where you will have less time.

Written for the 16K Spectrum by D Mellor of Keyworth, Notts.

```

1 CLEAR : RESTORE : LET hi=10
00: LET level=0
3 LET tot=0: LET score=0
5 GO SUB 9000
7 GO SUB 5000
8 LET speed=3
9 IF tot>hi THEN LET hi=tot
10 LET x=INT ( RND *27+1): LET
T f=INT ( RND *28+1)
13 LET g=1: LET z=1
14 LET c=4: LET t=750-(level*5
0): LET ti=t
15 LET hit=0: LET a=1
17 LET st=0
30 INK 7: PAPER 0: BRIGHT 1: B
ORDER 0: CLS
50 FOR n=0 TO 30 STEP 2: PRINT
: INK 4: BRIGHT 0: AT 18,n;"HI"
: NEXT n
55 PRINT AT 0,10;"HIGHEST SCO
RE: ";hi
60 PRINT AT 20,2;"HITS: ";hit
100 PRINT AT 20,20;"TIME: ";t;
" "
101 IF t <= 0 THEN BEEP 2,0: G
O TO 8000
102 PAUSE 1: PRINT INK 2: AT 3
,x;" EFG ": PRINT INK 6: AT 4,x
;" BCD "
104 IF PEEK 23560=48 AND st >=
6 THEN BEEP .05,20: GO SUB 100
0
106 POKE 23560,10
107 LET st=st+1: LET t=t-1
108 LET z=z+1: IF z=speed THEN
GO SUB 299
110 IF x=0 OR x=28 THEN LET a=
-a
120 LET x=x+a
200 GO TO 100
299 LET f=f+g
300 PRINT AT 17,f; INK c;" A "
: BEEP .0025,20
320 IF f=0 OR f=29 THEN LET g=
-g
360 LET z=1
380 RETURN
1000 FOR n=20 TO 90 STEP 10

```

```

1005 PLOT ((x+2)*8+4),135-n
1010 DRAW OVER 1;0,-13
1019 PAUSE 1
1020 IF ATTR (17,f+1)=71 THEN
BEEP .5,-10: LET hit=hit+1
1030 PLOT INK 0: ((x+2)*8+4),135
-n
1040 DRAW INK 0: OVER 1;0,-13
1045 NEXT n
1050 LET st=0
1070 IF hit=9 THEN LET c=2
1080 IF hit=10 THEN GO TO 2000
1085 PRINT INK 7: AT 20,2;"HITS
: ";hit
1090 RETURN
2000 INK 1: PAPER 7: CLS
2100 PRINT INK 2: FLASH 1: AT 9
,9;" CONGRATULATIONS "
2103 GO SUB 7000
2105 LET d=.0125: FOR n=1 TO 2:
FOR m=4 TO 16 STEP 2: BEEP d,m:
NEXT m: NEXT n
2107 PRINT AT 0,0;"SPEED: ";spe
ed-3: AT 0,20;"LEVEL: ";level+1
2108 PRINT AT 3,8;"SCORE: ";tot
2110 PRINT AT 13,12;"YOU KILLED
"
2111 PRINT INK 4: INVERSE 1: AT
15,11;"ICABOD FROG": INK 1: IN
VERSE 0: AT 17,9;"IN A TIME OF "
:t1-t
2112 PRINT AT 20,6;"PRESS A KEY
TO CONTINUE"
2115 PAUSE 0
2120 LET level=level+1: GO TO 9
5000 INK 0: BORDER 4: PAPER 7: B
RIGHT 1: CLS : PRINT AT 5,8;" I
CABOD THE FROG "
5010 FOR n=1 TO 15 STEP 3: PRINT
INK 4: AT 10,n;" A": BEEP .1
,-15: PAUSE 5: NEXT n
5013 PAUSE 50
5015 FOR n=15 TO 30 STEP 3: PRIN
T INK 4: AT 10,n;" A": BEEP .
1,-15: PAUSE 5: NEXT n: PRINT A

```

```

T 10,30;" "
5020 PRINT AT 12,2;"YOU MUST HI
T ICABOD 10 TIMES": PRINT AT 13
,6;"WITHIN THE TIME LIMIT"
5030 PRINT AT 14,7;"(PRESS ""0"
" TO FIRE)": PRINT AT 17,8;"ENT
ER SPEED (1-4)"
5032 INPUT speed: IF speed>4 OR
speed<1 THEN GO TO 5032
5035 PRINT INK 0: AT 19,8;"PRES
S ""s"" TO BEGIN"
5040 IF INKEY$=""s" THEN RETUR
N
5050 GO TO 5040
7000 LET score=INT (level*100*(
12/speed)+(level+1)*t/2+hit*10):
LET tot=tot+score
7001 RETURN
8000 PAPER 5: INK 0: BORDER 5: C
LS
8005 GO SUB 7000
8007 FOR n=-10 TO -20 STEP -1: B
EEP .25,n: NEXT n
8010 PRINT AT 6,7;"YOU RAN OUT
OF TIME "; AT 8,11;" SCORE ";tot
: AT 15,4;"PRESS ""y"" TO PLAY A
GAIN"
8015 IF INKEY$=""y" THEN GO TO
7
8020 GO TO 8015
8900 STOP
9000 FOR a=0 TO 8: FOR b=0 TO 7:
READ c: POKE USR ( CHR$ (a+144
))+b,c: NEXT b: NEXT a
9080 DATA 54,93,127,34,28,107,28
,119
9100 DATA 63,64,255,255,127,49,2
7,15
9200 DATA 255,0,255,255,255,157,
247,255
9300 DATA 252,2,255,255,255,140,
216,240
9320 DATA 0,0,0,0,3,4,8,16
9340 DATA 0,0,60,255,0,0,0,0
9360 DATA 0,0,0,0,192,32,16,8
9380 DATA 130,162,182,182,183,24
7,255,255,66,74,75,107,251,255,2
55,255
9400 RETURN

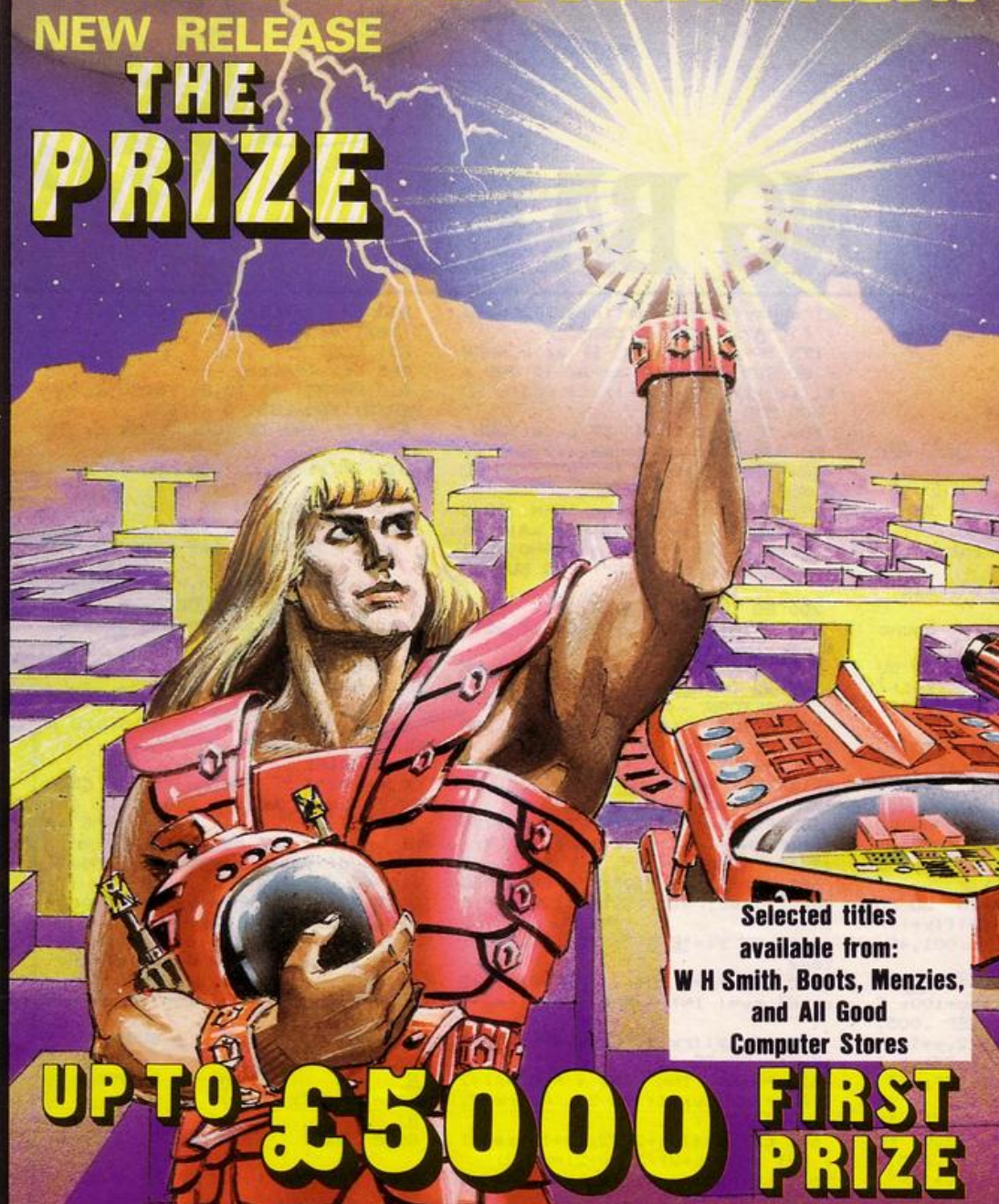
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A

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B

Funny goings-on deep in a mine. Can you escape the evil in its depths? "Original and fun . . . dexterity needed . . . strategy is also involved" — Games Computing.



C

Defuse a bomb hidden on the complex planet, Lattica, before it blows!! "...action packed game... addictive" — Sinclair user.



D

The mobs out to get ya' in this no-holds-barred 25 screen, action-packed game. "Tricky and highly entertaining" — Personal Computing News.

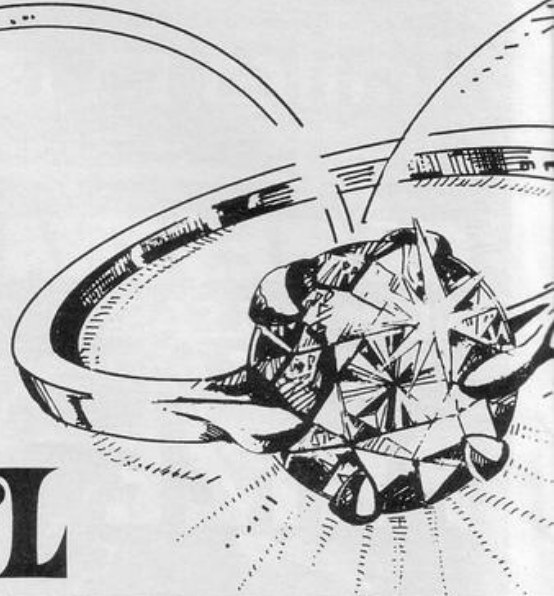
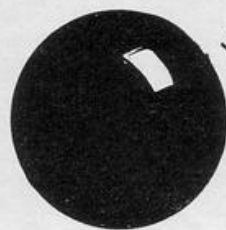


E

50 different screens of mayhem. "A fun game for all ages . . . which I thoroughly enjoyed." — Home Computing Weekly.

MOVE ROUND the maze collecting diamonds and swords. It is not so easy as it sounds, as you will be pursued by a bouncing ball. When you have collected all the objects in the maze you have to go to one of the secret passages.

Bouncing Ball was written for the 48K Spectrum by David Creighton, aged 14, of East Didsbury, Manchester.



BOUNCING BALL

```

5 Gosub 9000
10 OVER 0: BORDER 0: PAPER 0:
INK 9: CLS
15 GO SUB 8000
20 DIM a$(10,64)
21 LET sc=0: LET li=3
24 LET items=3
25 LET t=0: LET x=17: LET y=2:
LET ax=3: LET ay=28
26 LET items=items+1
30 RESTORE 9100: FOR a=1 TO 10
: READ a$(a): NEXT a
40 GO SUB 600: REM Print maze

100 GO SUB 500: REM Print man

105 GO SUB 550: REM Print bounc
y ball
110 IF INKEY$="8" THEN GO SU
B 500: LET y=y+(2 AND a$((x+1)/
2),y+3) <> "A"): BEEP .001,y+20:
GO SUB 500
115 IF INKEY$="5" THEN GO SU
B 500: LET y=y-(2 AND a$((x+1)/2
,y) <> "B"): BEEP .001,50-y: GO
SUB 500
120 IF INKEY$="6" THEN GO SU
B 500: LET x=x+(2 AND a$((x/2)+1
,y+1) <> "A"): BEEP .001,40-y: G
O SUB 500
125 IF INKEY$="7" THEN GO SU
B 500: LET x=x-(2 AND a$((x+1)/
2)-1,y+1) <> "A"): BEEP .001,45-
y: GO SUB 500:
130 IF a$((x+1)/2),y+1)="E" T
HEN LET t=t+1: LET sc=sc+100: F
OR z=10 TO 40 STEP 5: BEEP .005,
z: NEXT z: LET a$((x+1)/2,y+1)="
": LET a$((x+1)/2)+1,y+33)=" "
: PRINT OVER 1: AT x,y;"E": AT
x+1,y;"F"
135 IF a$((x+1)/2),y+1)="G" TH
EN LET t=t+1: LET sc=sc+200: F
OR z=20 TO 60 STEP 5: BEEP .005,z
: NEXT z: LET a$((x+1)/2,y+1)="
": LET a$((x+1)/2)+1,y+33)="
": PRINT OVER 1: AT x,y;"GH": A
T x+1,y;"IJ"
140 IF t >= items AND (x <= 2 O
R x >= 19) AND y=14 THEN GO TO
700
145 IF x >= 19 AND y=14 THEN G
O SUB 500: LET x=3: LET y=14: GO
SUB 500
150 IF x <= 2 AND y=14 THEN GO
SUB 500: LET x=17: LET y=14: GO
SUB 500
155 PRINT AT 21,7: PAPER 2: BR
IGHT 1;sc; BRIGHT 0;" "; BRIGHT
1: AT 21,27;li; BRIGHT 0;" "
160 IF x=ax AND y=ay THEN GO S
UB 800
161 LET o=ax: LET p=ay
165 IF ay>y THEN GO SUB 550: L
ET ay=ay-(2 AND a$((ax+1)/2,ay)
<> "B"): GO SUB 550
170 IF ay<y THEN GO SUB 550: L

```

```

ET ay=ay+(2 AND a$((ax+1)/2,ay+3
) <> "A"): GO SUB 550
175 IF ax<19 THEN IF ax>x THEN
GO SUB 550: LET ax=ax-(2 AND a
$((ax+1)/2)-1,ay+1) <> "A"): GO
SUB 550
180 IF ax>2 THEN IF ax<x THEN
GO SUB 550: LET ax=ax+(2 AND a$
((ax+1)/2+1,ay+1) <> "A"): GO SU
B 550
190 IF ax=0 AND ay=p THEN GO S
UB 550: LET ay=ay+(2 AND a$((ax
+1)/2),ay+3) <> "A")-(2 AND a$((
ax+1)/2),ay) <> "B"): GO SUB 55
0
200 GO TO 110
500 PRINT AT x,y: OVER 1: BRIG
HT 1: INK 6;"KL"
505 PRINT AT x+1,y: OVER 1: BR
IGHT 1: INK 6;"MN"
510 RETURN
550 PRINT AT ax,ay: OVER 1: BR
IGHT 1: INK 4;"OP"
555 PRINT AT ax+1,ay: OVER 1:
BRIGHT 1: INK 4;"QR"
560 RETURN
600 FOR a=1 TO 10: BEEP .001,40
+a: PRINT AT (a*2)-1,0: INK 4;;
a$(a): NEXT a
601 PRINT AT 21,0: PAPER 2;"SC
ORE ";sc; AT 21,21;"LIVES ";l
i
605 LET z$="E F ": FOR z=1 TO i
tems
610 LET rx=(INT (RND *8)+1)*2
: LET ry=(INT (RND *14)+1)*2
615 IF a$((rx+2)/2,ry+1) <> " "
THEN GO TO 610
620 PRINT INK INT (RND *6)+2
: AT rx+1,ry;z$(3 TO 2): AT rx+2,
ry;z$(3 TO 2)
621 LET a$((rx+2)/2,ry+1)=z$(1)
: LET a$((rx+2)/2,ry+2)=z$(2)
622 LET a$((rx+1)/2,ry+32)=z$(3
): LET a$((rx+1)/2,ry+32)=z$(4)
625 LET z$="GHIJ" AND z >= 2)+
("E F " AND z <= 1): NEXT z
630 RETURN
700 FOR a=1 TO 50
701 OUT 254,7
702 OUT 254,130
703 OUT 254,30
704 OUT 254,16
705 OUT 254,255
706 OUT 254,201
707 OUT 254,150
708 NEXT a
710 BEEP .002,a
715 FOR a=0 TO 10: FOR b=1 TO 7
: BEEP .02,(a+b)+RND *10: PRINT
AT 10,11: PAPER b: INK 9: FLAS
H 1;"BONUS": NEXT b: NEXT a
720 CLS : LET sc=sc+500
730 GO TO 25
800 FOR b=1 TO 5: FOR a=0 TO 7:

```

```

BORDER a: BEEP .005,a*b: NEXT a
: NEXT b: BORDER 0
801 CLS
805 LET li=li-1
810 PRINT AT 10,8: FLASH 1: PA
PER 2;"YOU LOST A LIFE"
815 FOR a=1 TO 100: PAUSE 1: NE
XT a
816 IF li <= 0 THEN GO TO 830

820 CLS : GO TO 25
830 CLS : PRINT INK 9: AT 10,9
: PAPER 3: FLASH 1;"GAME OVER "

840 PRINT AT 21,0;" Another
r game (y/n)?: PAUSE 0
850 IF INKEY$="y" OR INKEY$
="Y" THEN RUN
860 GO TO 850
8000 REM Instructions
8005 PRINT AT 0,0: PAPER 2: INK
9: BRIGHT 1;" BOUNCING B
ALL "
8015 PRINT AT 3,0;
8020 PRINT " The object in ESCA
PE is to escape the grips of
BOUNCY THE BA
LL if bouncy bounces o
n top of youthen you will lose a
life"
8025 PRINT " When you are wonde
ring around the maze you have to
pick up theswords and diamonds.
When all theswords and diamonds
have been collected then you p
roceed to one of the secret pa
ssages."
8030 PRINT " ~E~ - A SWORD ~K
~F~ - YOU ~M
~N~ ~GH~ - A DIAMOND ~O
~P~ - BOUNCY ~J
~R~
8035 PRINT "KEYS :- 5,6,7 & 8"

8100 FOR a=0 TO 7: BEEP .002,a+
ND *10+a
8105 PRINT AT 21,0: INK 9: PAPE
R A;" PRESS ANY KEY TO PLAY
"
8110 IF INKEY$ <> " " THEN CLS
: RETURN
8115 NEXT a: GO TO 8100
9005 REM Data for Graphics
9010 DATA 255,128,192,224,255,24
0,240,240
9020 DATA 254,2,6,14,254,30,30,3
0
9030 DATA 240,240,240,255,224,19
2,128,255
9040 DATA 30,30,30,254,14,6,2,25
4
9045 DATA 0,0,0,8,8,28,28,28
9050 DATA 28,28,62,29,29,30,0,0
9055 DATA 0,0,0,15,16,32,64,63
9060 DATA 0,0,0,240,16,8,4,252

```


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£9.95

SLOT THE BALL into the goal at either end of the rink, using keys M and Z. Key Z will move the ball towards the centre of the rink and M will move out the ball towards the goal. As the ball nears the goal you must avoid the keepers, as running into them will cause a life to be lost.

Roll-a-Ball was written for the 48K Spectrum by J Kelly of Denny, Stirlingshire.

```

20 BRIGHT 1: PAPER 7:
  BORDER 6: INK 1: CLS
30 LET def=1600:
  LET end=2000
40 LET inst=3000:
  LET scroll=3500
50 LET lives=5000:
  LET scheck=7500
60 LET foul=7700:
  LET score=8500
70 LET udg=9000:
  LET oval=9500
80 LET s$="": LET h$=""
90 LET o=6: LET i=11:
  LET d=9: LET e=13
100 GO SUB udg
110 GO SUB inst
120 GO SUB oval
130 GO SUB score
140 LET l=0
1030 FOR n=1 TO 8
1040 LET x=11+o* COS (n/4* PI ):
  LET xo=11+o* COS ((n-1)/
4* PI )
1050 LET y=16+i* SIN (n/4* PI ):
  LET yo=16+i* SIN ((n-1)/
4* PI )
1060 PRINT AT x,y;"A"; AT xo,yo
;" "
1070 GO SUB def
1080 IF ATTR (x,y) <> 121 THEN
  GO SUB foul: NEXT n: GO TO 1030
1090 IF INKEY$ <> "" THEN BEE
P .002,30: GO SUB scheck
1110 NEXT n
1120 GO TO 1030
1620 IF d=13 THEN GO TO 1700
1630 PRINT AT 22-d,2;" "; AT d,
4;" "
1640 PRINT AT d,28;" "; AT 22-d
,30;" "
1650 LET d=d+1
1660 PRINT INK 2; AT d,4;"D"; A
T 22-d,2;"D"
1670 PRINT INK 2; AT d,28;"D";
AT 22-d,30;"D"
1680 RETURN
1700 PRINT AT 22-e,2;" "; AT e,
4;" "
1710 PRINT AT e,28;" "; AT 22-e
,30;" "
1720 LET e=e-2
1730 PRINT INK 2; AT e,28;"D";
AT 22-e,30;"D"
1740 PRINT INK 2; AT e,4;"D"; A
T 22-e,2;"D"
1750 IF e=9 THEN LET d=9: LET e
=13
1760 RETURN
2010 IF VAL h$< VAL s$ THEN
  LET h$=s$: LET s$="": GO TO 220
0
2020 FLASH 1: CLS : PRINT AT 9,
10;"GAME OVER !"; AT 10,10;"SCOR
E: "; VAL s$
2030 LET s$=""
2040 GO TO 2210
2200 FLASH 1: CLS : PRINT AT 9,
4;"A NEW HIGH SCORE !!"; " "; VA
L h$
2210 PAUSE 50: FOR b=0 TO 50 ST
EP 5: BEEP .07,b: NEXT b: PRINT
INVERSE 1; AT 12,7;"ANOTHER GAM
E ?(Y/N)": PAUSE 0
2220 IF INKEY$ <> "n" THEN FL
ASH 0: CLS : GO TO 120
2230 FLASH 0: CLS

```



```

2240 FOR c=0 TO 16 STEP 4
2250 PRINT AT c,0: INK 6;a$; IN
K 5;b$; INK 1;c$; INK 0;d$
2260 BEEP .04,-c
2270 NEXT c: STOP
3000 LET a$="(10*sp:ig5:g5:7*sp:
g5:6*sp:ig5:g5) "
3010 LET b$="(4*sp:g5:g7:ig5:ig4
:g7:sp:ig5:g5:sp:ig4:g6:4*sp:g5:
g3:ig5:g5:g3:ig7:sp:ig5:g5:4*sp)
"
3020 LET c$="(2*ig8:2*sp:ig8:sp:
g5:ig5:ig8:g5:ig5:ig8:g5:ig5:ig8
:sp:2*ig8:sp:ig8:g5:ig5:ig8:g5:i
g5:ig5:ig5:ig8:2*sp:2*ig8) "
3030 LET d$="(4*sp:ig8:sp:g5:ig1
:ig8:g5:ig5:ig8:g5:ig1:ig8:ig5:3
*sp:ig8:ig2:ig5:ig8:ig2:ig8:g5:i
g5:ig8:4*sp) "
3040 GO SUB scroll
3050 PRINT PAPER 5; INK 7; AT 1
6,3;"PRESS ""I"" FOR INSTRUCTION
S"; AT 18,3;" ANY OTHER KEY TO
PLAY "
3060 PAUSE 0: IF INKEY$ <> "i"
THEN CLS : RETURN
3070 CLS : GO SUB scroll
3100 PRINT INK 2; AT 5,3;
" The aim of the game is
to slot the ball into the
goal at either end of the
rink.
You have two directions
of movement-

```

```

Outwards.(away from centre)
Inwards....(towards centre)
these use keys ""m"" and ""z
respectively."
3110 PRINT PAPER 5; AT 16,3;"PR
ESS ANY KEY TO CONTINUE"
3120 PAUSE 0: CLS : GO SUB scrol
l
3130 PRINT INK 2; AT 5,3;
"You have 5 lives , number
remaining shown at centre
screen. You will lose
a life if you try to go
over either edge of the
rink and also if you land
on a position which the
defence are occupying.You
score 50 points per goal"
3140 PRINT PAPER 5; AT 15,3;"PR
ESS ANY KEY TO CONTINUE"
3150 PAUSE 0: CLS : GO SUB scrol
l
3160 PRINT INK 2; AT 6,5;
"PRESS ""I"" FOR A REPEAT
OF THE INSTRUCTIONS
ANY OTHER KEY TO PLAY"
3170 PAUSE 0
3180 IF INKEY$ <> "i" THEN CL
S : RETURN
3190 CLS : GO TO 3070
3490 RETURN
3540 FOR m=1 TO 31 STEP 2

```



```

3550 PRINT AT 18,m-1;a$( TO 33-
m)
3560 PRINT AT 19,m-1;b$( TO 33-
m)
3570 PRINT AT 20,m-1;c$( TO 33-
m)
3580 PRINT AT 21,m-1;d$( TO 33-
m)
3590 IF m<2 THEN NEXT m
3600 PRINT AT 0,0;a$(32-m TO )
3610 PRINT AT 1,0;b$(32-m TO )
3620 PRINT AT 2,0;c$(32-m TO )
3630 PRINT AT 3,0;d$(32-m TO )
3640 NEXT m
3650 RETURN
5005 LET 1=1+1
5010 PRINT AT 11,13+1;" ": BEEP
.3,-5
5020 IF 1 >= 5 THEN GO TO end
5030 RETURN
7505 IF INKEY$ ="m" THEN GO TO
8000
7510 PRINT AT x,y;" ": AT x,y
;" "
7520 IF o>3 THEN LET o=o-1: LET
i=i-1: RETURN
7705 PRINT AT x,y;" ": FLASH
1; AT x,y;"E": PAUSE 100
7710 BEEP .5,1: BEEP .5,-2: GO S
UB lives
7715 PRINT AT x,y;" ": AT x,y
;" "
7720 LET o=6: LET i=11
7730 RETURN
8000 PRINT AT x,y;" ": AT x,y
;" "
8010 IF i>13 AND n <> 2 AND n <>
6 THEN GO SUB foul: RETURN
8020 LET o=o+1: LET i=i+1
8030 IF i<15 THEN RETURN
8130 PRINT FLASH 1: INK 2; OVER
1; AT 11,31;"A"; AT 11,1;"A"
8140 FOR j=0 TO 60 STEP 4: BEEP
.008,j/2: NEXT j

```

```

8160 LET s$= STR$ ( VAL s$+50)
8510 IF LEN s$<5 THEN LET s$="
0"+s$: GO TO 8510
8520 IF LEN h$<5 THEN LET h$="
0"+h$: GO TO 8520
8530 PRINT INK 7; PAPER 2; AT 0
,7;s$: AT 0,27;h$
8540 PRINT INK 2; AT 11,1;"B";
AT 11,31;"C"
8550 LET o=6: LET i=11
8560 RETURN
9000 RESTORE 9980
9005 FOR a=USR "a" TO USR "e"+
7
9010 READ b: POKE a,b: NEXT a
9020 RETURN
9500 RESTORE 9990
9505 FOR y=0 TO 164 STEP 2
9510 PLOT PAPER 6; BRIGHT 0;7,y
9520 READ x: DRAW x,0
9530 PLOT 255,y: DRAW -x,0
9540 NEXT y: PLOT BRIGHT 0; PAP
ER 6; INK 6;7,168
9550 RESTORE 9992
9560 FOR y=65 TO 103 STEP 2
9570 READ x
9580 PLOT x,y: DRAW 2*(131-x),0
9590 BEEP .05,y/2-20
9600 NEXT y
9610 PLOT 7,0: DRAW 248,0: DRAW
0,165: DRAW -248,0: DRAW 0,-165
9620 PRINT INK 2; AT 11,14;"AAA
AA"
9630 PRINT BRIGHT 0; AT 0,12;"
"
9640 PRINT INK 0; FLASH 1; AT 1
8,10;"PRESS ANY KEY"; AT 19,13;"
TO PLAY"
9650 LET x$=" ROLLA-BALL * RO
LLA-BALL * "
9660 INVERSE 1: INK 2
9670 FOR n=1 TO 31
9680 PRINT AT 0,n;x$( TO 32-n)
9690 IF n >= 2 THEN PRINT AT 0
,1;x$(33-n TO )
9700 IF n >= 2 THEN PRINT AT 0
,1;x$(33-n TO )

```

```

,1;x$(33-n TO )
9710 PAUSE 5
9720 IF INKEY$ <> "" THEN GO
TO 9740
9730 NEXT n: GO TO 9670
9740 INVERSE 0: INK 1
9750 FOR b=0 TO 10: BEEP .01, RN
D *40: NEXT b
9760 PRINT AT 15,10;"
"; AT 16,13;" "
9770 PRINT INK 7; PAPER 2; AT 0
,1;"Score: "; AT 0,22;"High:
"
9900 PRINT INK 2; AT 11,1;"B";
AT 11,31;"C"
9910 PRINT BRIGHT 0; PAPER 6; A
T 0,12;" "
9920 PRINT AT 18,10;"
"; AT 19,13;" "
9930 RETURN
9980 DATA 0,0, BIN 11000,
BIN 111100, BIN 111100,
BIN 11000,0,0,255,255,
BIN 11100000, BIN 11000000,
BIN 11000000, BIN 11000000,
255,255,255,255,7,3,3,7,255
,255, BIN 11000, BIN 11000,
BIN 111110, BIN 1011101,
BIN 10011001, BIN 10100101,
BIN 100100, BIN 1100110,
BIN 1000010, BIN 10100010,
BIN 1110100, BIN 111100,255,
BIN 1011100, BIN 10010010,
BIN 10001
9990 DATA 124,124,124,124,95,88,
77,71,65,60,56,52,50,46,42,
39,36,34,31,29,27,25,23,21,
19,18,16,15,14,13,12,11,7,
7,7,7,7,7,7,7,7,7,7,7,
7,7,7,7,7,7,11,12,13,14,
15,16,18,19,21,23,25,27,29,
31,34,37,39,42,46,50,53,57,
62,65,71,77,86,96,124,124,
9992 DATA 108,100,97,93,91,88,
86,85,84,84,84,84,85,86,88,
91,93,95,100,108
9999 SAVE "roll-a-ball" LINE 10

```

MPG

USING keys 5 and 8 you have to drive from London to Aberdeen. You have 6,000 cash units and a full tank to start. When you reach a filling station you must decide if you need petrol and also if the price is

reasonable. If you reach Aberdeen without running out of fuel or cash you will be booked into the Aberdeen Hilton as a reward. MPG was written for the 16K Spectrum by Douglas Killen of London NW11.

```

1 BORDER 7: PAPER 7: INK 0: B
RIGHT 0: OVER 0: FLASH 0: INVERS
E 0: GO SUB 99
2 POKE 23658,255
11 CLS : LET a=18
12 LET b=11
13 LET f=10
14 LET m=0
15 LET p= INT ( RND *100)+120
16 LET cash=6000
20 PRINT "The object of the ga
me is to getto Aberdeen from Lon
don without running out of fuel
or money.Youstart off with a ful
l tank i.e. 10 gallons.Every so
often you pass a petrol statio
n.Each one has a different pric
e per gallonand you choose wheth
er to acceptthe offer or not,bea
ring in mindthat you will not re
ach one if you stay still,so if
your fuel is very low,you may
have to buy at a high price in o
rder to stayin the game."
21 PRINT " Use ~5~ for left an
d ~8~ for right,although which
ever way youmove,you still move
towards Aberdeen."
22 PRINT " A record of your ca
sh,miles to go,miles already tra
velled and fuel are kept and di
splayed on the screen constantl
y."
24 PRINT #0; AT 1,3; INK 1; PA

```

```

PER 6; FLASH 1;"Press any key to
continue": PAUSE 0
25 CLS
30 PRINT "AB..... You
(2*ig8).....
Road CC.....
Petrol pump"
35 PRINT AT 8,4; FLASH 1; INK
1; PAPER 6;"Press any key to st
art"
40 PAUSE 0: CLS
70 PRINT AT a,b; INK 1;" AB
"
71 PRINT AT 19,0;"(2*sp:28*ig
8:2*sp)": LET i=0
72 IF INKEY$ ="5" AND b>0 THE
N LET b=b-1: LET f=f-.1: LET m=
m+1: LET i=1
74 IF INKEY$ ="8" AND b<26 TH
EN LET b=b+1: LET f=f-.1: LET m
=m+1: LET i=1
75 LET p= INT ( RND *100)+120
98 GO TO 331
99 REM AB
100 POKE USR "a"+0, BIN 00000000
110 POKE USR "a"+1, BIN 00000000
120 POKE USR "a"+2, BIN 00000000
130 POKE USR "a"+3, BIN 00000111
140 POKE USR "a"+4, BIN 00001001
150 POKE USR "a"+5, BIN 00011111
160 POKE USR "a"+6, BIN 00011011
165 POKE USR "a"+7, BIN 00000100
168 POKE USR "b"+0, BIN 0
170 POKE USR "b"+1, BIN 0

```

```

180 POKE USR "b"+2, BIN 0
190 POKE USR "b"+3, BIN 11000000
200 POKE USR "b"+4, BIN 00100000
210 POKE USR "b"+5, BIN 11111100
220 POKE USR "b"+6, BIN 1101100
230 POKE USR "b"+7, BIN 00010000
240 REM C
250 POKE USR "c"+0, BIN 0
260 POKE USR "c"+1, BIN 01111110
270 POKE USR "c"+2, BIN 01111110
280 POKE USR "c"+3, BIN 00110000
290 POKE USR "c"+4, BIN 01111110
300 POKE USR "c"+5, BIN 01111110
310 POKE USR "c"+6, BIN 01111110
320 POKE USR "c"+7, BIN 01111110
321 REM D
322 POKE USR "d"+0, BIN 00100100
323 POKE USR "d"+1, BIN 00100100
324 POKE USR "d"+2, BIN 11111111
325 POKE USR "d"+3, BIN 00100100
326 POKE USR "d"+4, BIN 00100100
327 POKE USR "d"+5, BIN 11111111
328 POKE USR "d"+6, BIN 00100100
329 POKE USR "d"+7, BIN 00100100
330 RETURN
331 PRINT AT 1,20;( INT (f*10+
.5)/10);" ": AT 0,20;"Gallons"
340 PRINT AT 5,20;"Miles"; AT
6,20;m
350 PRINT AT 0,0;"Cash"; AT 1,
0;cash
370 IF m=500 THEN PRINT "You h
ave reached Aberdeen.We have
booked a room for you at the A

```



```

ie:ii:ic:ie:is:it:ie:ir)"
413 IF m=104 THEN LET c$="
"
414 IF m=120 THEN LET c$="(iN:
io:it:it:ii:in:ig:ih:ia:im)"
415 IF m=123 THEN LET c$="
"
416 IF m=160 THEN LET c$="(iS:
ih:ie:if:if:ii:ie:il:id)"
417 IF m=163 THEN LET c$="
"
418 IF m=190 THEN LET c$="(iL:
ie:ie:id:is)"
419 IF m=193 THEN LET c$="
"
420 IF m=220 THEN LET c$="(iY:
io:ir:ik)"
421 IF m=223 THEN LET c$="
"
422 IF m=300 THEN LET c$="(iN:
ie:iw:ic:ia:is:it:il:ie)"
423 IF m=303 THEN LET c$="
"
424 IF m=400 THEN LET c$="(ie:
id:ii:in:ib:iu:ir:ig:ih)"
425 IF m=403 THEN LET c$="
"
426 IF m=450 THEN LET c$="(iD:
iu:in:id:ie:ie)"
427 IF m=453 THEN LET c$="
"
430 IF m=20 OR m=23 OR m=100 OR
m=104 OR m=120 OR m=123 OR m=16
0 OR m=163 OR m=190 OR m=193 OR
m=220 OR m=223 OR m=300 OR m=303
OR m=400 OR m=403 OR m=450 OR m
=453 THEN PRINT AT 4,15;c$
500 LET c= INT ( RND *30)
502 IF t>96 AND t<101 OR t <= 2
83 AND t >= 280 THEN LET c=10
505 IF c <> 1 OR i=0 THEN GO T
O 8888

510 IF c=1 THEN PRINT AT 7,0;
"(iT:ie:ix:ia:ic:io:27*sp:ig8:2*
sp:ig8:28*sp:ig8:CC:ig8)"
511 BEEP .15,23: BEEP .15,23: B
EEP .15,23
513 IF c=1 THEN PRINT AT a,b+
i;"(ig8:AB:ig8)"
514 PRINT AT a-1,b+1;"(ig8:2*s
p:ig8)"; AT a-2,b;"(iT:ie:ix:ia:
ic:io)"
515 PRINT AT 10,0;"Pence per g
allon: ";p

520 PRINT "Do you want to fill
up?": PAUSE 4e4
540 PAUSE 0
541 IF INKEY$ ="N" THEN CLS :
GO TO 8888
542 PRINT "Do you want to fill
up to the top ?": PAUSE 0: IF
INKEY$ ="Y" THEN GO TO 550
544 IF INKEY$ ="N" THEN PRINT
"How many gallons do you want ?
minimum:0.1 gallons
maximum: ";10-f;" gallons": INP
UT i
545 IF i>10-f OR i<0.1 THEN IN
PUT i: GO TO 545
546 PRINT i;" gallons costs ";i
*p;" pence": LET cash=cash-i*p:
PRINT "Cash: ";cash;" pence": LE
T f=f+i: GO TO 570
550 PRINT "To fill up you will
need ";10-f;" Gallons"
555 PRINT 10-f;" gallons costs
";(10-f)*p
557 LET cash=cash-(10-f)*p: LET
f=10
560 PRINT "Cash: ";cash;" pence
"
570 PAUSE 4e4: CLS
8888 GO TO 70
9999 BORDER 7: PAPER 7: INK 0: C
LS : POKE 23692,255: LIST

```


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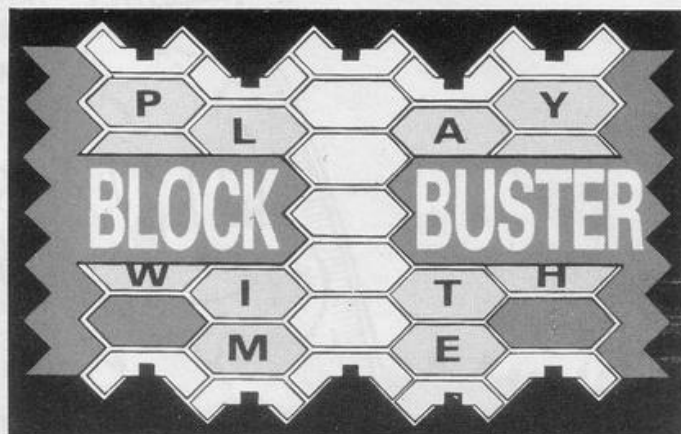
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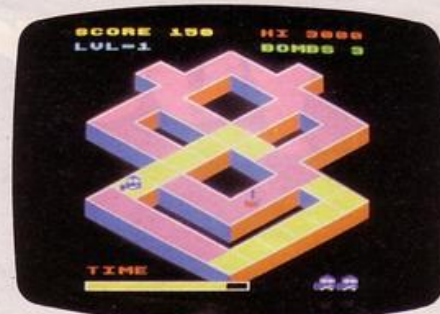
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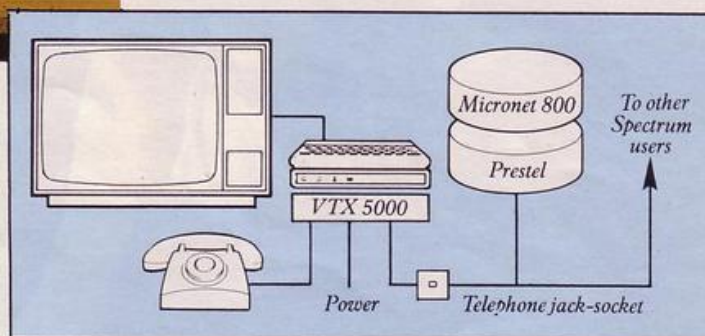
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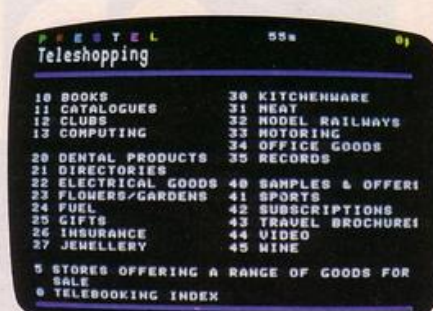
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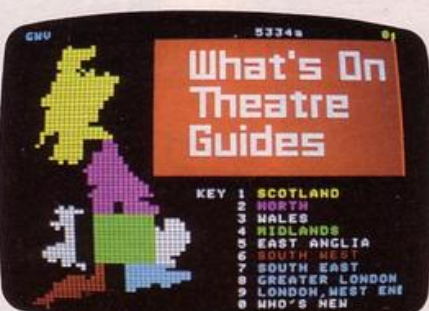
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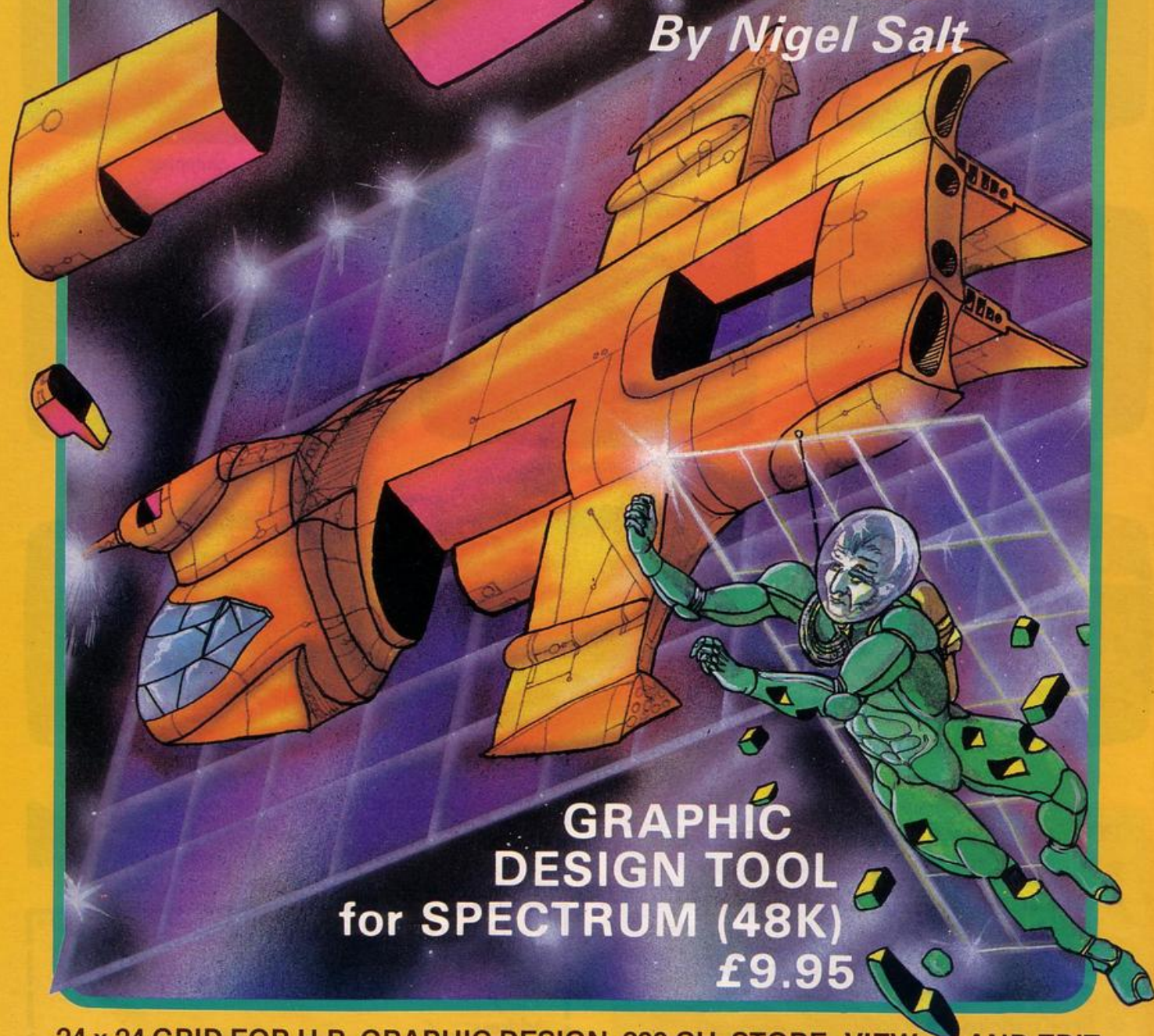
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MOLE ATTACK

DESTROY the castle by releasing bombs and directing them to the turrets. Each time you drop a bomb the mole moves one step nearer the base of the hill on which you are standing. If the mole eats its way through the base of the hill it will collapse and you will fall to your doom.

Mole Attack was written for the 16K Spectrum by Mark Rowland of Hillingdon, Middlesex.

```

6 GO SUB 1000:
10 GO SUB 4000
15 GO SUB 8000: BORDER 5: PAPE
R 7: CLS
20 LET v1=10: LET co=0: LET o1
=v1+D1
25: INK 2: REM setup"
30 PRINT AT 3,0;"(ig8)": AT 2
,0;"(2*ig8)"
40 FOR a=4 TO 5: PRINT AT a,0
;"(2*ig8)": NEXT a
50 FOR b=6 TO 9: PRINT AT b,0
;"(3*ig8)": NEXT b
60 FOR c=10 TO 15: PRINT AT c
,0;"(4*ig8)": NEXT c: REM 4 bloc
ks
70 FOR d=16 TO 20: PRINT AT d
,0;"(5*ig8)": NEXT d: REM 5 bloc
ks
80 INK 4: FOR e=0 TO 31: PRINT
BRIGHT 1: AT 21,e;"(ig8)": NEX
T e: FOR g=5 TO 17: PRINT BRIGH
T 0: AT 20,g;"(ig8)": NEXT g: PR
INT AT 20,27;"(5*ig8)"
82 PRINT INK 0: AT 21,o1+1;"H
"
85 INK 0: PRINT AT 20,5;"(ig8
)": AT 15,4;"(ig8)": AT 9,3;"(ig
8)": AT 5,2;"(ig8)"
90: REM castle
100 FOR f=18 TO 26: PRINT INK
1: AT 20,f;"(ig8)": INK 2: AT 19
,f;"(ig8)": AT 18,f;"(ig8)": NEX
T f
110 PRINT INK 2: AT 17,18;"A A
A A": AT 20,22;"B"
120 INK 1: REM man+gun
130 PRINT AT 0,0;"C": AT 1,0;"
D": AT 1,1;"E"
200 PAUSE 0
205 IF INKEY$="1" THEN GO TO
220
206 GO TO 204
210 GO TO 200
220 FOR y=2 TO 30
225 PRINT AT 1,y;"E"
230 IF INKEY$="0" THEN GO SU
B 2000
240 NEXT y
243 PRINT AT 1,y;" "
250 BEEP .2,20: GO TO 205
1000 FOR w=0 TO 9
1010 READ s$
1020 FOR u=0 TO 7
1030 READ r: POKE USR s$+u,r
1040 NEXT u
1050 NEXT w
1060 DATA "A",219,219,255,255,12
6,255,255,255,"B",24,126,213,42,
213,42,213,42,"C",56,127,60,62,6

```

```

0,60,24,60,"D",60,60,60,56,16,16
,16,60,"E",0,64,253,127,14,62,25
5,255
1070 DATA "F",192,252,127,63,63,
127,252,192,"G",195,231,126,126,
126,126,60,24,"H",0,32,126,254,2
55,38,99,193,"I",66,36,24,129,66
,165,90,255,"J",129,65,66,34,20,
28,157,24
1080 RETURN
2000: FOR i=1 TO 20:
2005 LET q=y
2008 PRINT AT 1,q+1;" "
2010 PRINT INK 0: AT i-1,q;" ";
AT i,q;"G"
2012 IF ATTR (20,q)=TI THEN LE
T co=co+1
2022 NEXT i
2025 GO SUB 5000
2029 IF co<152 THEN GO TO 245
2030 FLASH 1: BRIGHT 1: FOR t=0
TO 30: BEEP .1,t: NEXT t: PRINT
AT 11,5;"YOU DESTROYED THE CAST
LE": AT 12,4;"AND YOU WERE ";o1:
" SPACES FROM": AT 14,14;"DEATH"
2040 INPUT "ANOTHER GO (y/n)";b$
2045 FLASH 0: BRIGHT 0
2050 IF b$ <> "y" THEN STOP
2060 GO SUB 4000: GO TO 15
3000 FOR l=30 TO -30 STEP -1: BE
EP .08,l: NEXT l: PRINT FLASH 1
; AT 11,12;"BAD LUCK!!!!"
3010 GO SUB 8040
3020 IF A$ <> "y" THEN STOP
3030 CLS: RETURN
4000 BRIGHT 0: BORDER 0: PAPER 5
: CLS: BEEP .1,0: BEEP .1,4: BE
EP .1,7: BEEP .3,12: BEEP .1,7:
BEEP .6,12
4005 PAUSE 3
4010 BEEP .1,12: BEEP .1,7: BEEP
.1,4: BEEP .3,0: BEEP .1,7: BEE
P .6,4
4050 PRINT FLASH 1: INK 0: AT 5
,11;"PRESENTING"
4053 INK 1: PRINT AT 10,3;"(3*i
g3:3*sp:ig1:ig3:ig2:3*sp:3*ig3:3
*sp:3*ig3:3*sp:3*ig3:2*sp)"
4054 PRINT AT 11,3;"(ig1:2*ig3:
4*sp:ig8:4*sp:ig5:2*ig3:3*sp:ig5
:sp:ig3:3*sp:ig5:2*ig3)"
4055 PRINT AT 12,3;"(2*ig3:ig2:
3*sp:ig1:ig8:ig2:3*sp:ig5:2*ig3:
3*sp:ig1:ig3:ig2:3*sp:ig5:2*ig3:
3*sp)"
4060 INPUT "INSTRUCTIONS: (y/n)";
r$

```

```

4070 IF r$="n" THEN GO TO 7020:
4080 GO SUB 7000:
4090 RETURN
5000 LET o1=v1+D1: PRINT INK 0:
AT 21,o1;"H": AT 21,o1+1;" ": L
ET v1=v1-1
5020 IF o1=0 THEN GO SUB 6000:
GO TO 5040
5030 RETURN
5040 PRINT AT 11,3;"THE MOLE AT
E THRU THE HILL"
5050 GO SUB 8040
5060 IF A$ <> "y" THEN STOP
5070 CLS: GO SUB 4000: GO TO 15
6000 FOR t=20 TO 2 STEP -1
6010 PRINT AT t,0;" "
6020 NEXT t
6030 PRINT AT 0,0;" "; AT 1,0;"
"
6040 FOR s=1 TO 20: PRINT AT s,
3;"C": AT s+1,3;"D": AT s-1,3;"
": BEEP .04, INT (18/s)
6050 NEXT s
6060 PRINT INK 2: AT 21,3;"I":
AT 20,3;"J": BEEP .6,-30:
6070 RETURN
7000 CLS: INK 0: PRINT "You mus
t destroy the castle before
the mole (H) eats his way throug
h the base of the hill, and sen
ds you plunging to your
DEATH"
7010 PRINT "Begin by pressing k
ey '1' to start the firing of
the bombs and the '0' key to
drop the bomb"
7015 PRINT "Each time the 0 ke
y is pressed the mole moves 1 st
ep nearer to your DOWN FALL"
7020 PRINT "DIFFICULTY (1 TO
5) :- 1=HARD
:- 5=EASY"
7021 INPUT D1
7025 IF D1<1 OR D1>5 OR D1 <> 1
NT D1 THEN GO TO 7020
7030 CLS: RETURN
8000 INPUT "DAY LIGHT(1),DUSK(0)
";E1
8005 IF E1 <> INT E1 OR E1<0 OR
E1>1 THEN GO TO 8000
8010 BRIGHT E1
8020 IF E1=1 THEN LET TI=121: R
ETURN
8030 LET TI=57: RETURN
8040 INPUT "ANOTHER FEEBLE ATTEM
PT?-(y/n)";A$
8050 RETURN

```


CAVERN BLAST

YOU COMMAND a cannon which protects a fortress hidden in a deep cave. The enemy has discovered the hideout and is sending fighters to attack. Move your cannon using Q and Z, and P to fire. If the enemy hits your shield, you lose one of three lives. You can hold the game by pressing H. **Cavern Blast** was written for the 16K Spectrum by P Masterson, aged 14, of Preston, Lancs.

```

3 LET B1=0: POKE 23658,B
5 BORDER 0: PAPER 0: INK 7: C
LS
10 FOR f=0 TO 7: FOR g=0 TO 7:
READ a: POKE USR CHR$ (144+f)
+g,a: NEXT g: NEXT f
20 DATA 192,240,80,127,127,80,
240,192
30 DATA 0,0,0,255,255,0,0,0
40 DATA 0,1,31,99,127,31,1,0

50 DATA 48,248,24,238,238,24,2
48,48
60 DATA 24,73,214,143,47,216,3
4,24
70 DATA 0,12,62,199,255,62,120

80 DATA 15,62,124,216,216,124,
52,15
90 DATA 255,1,1,1,1,1,1,255

100 FOR f=5 TO 16
510 PRINT AT 5,0: INK 6;" UP="
"Q"" DOWN=""Z"" FIRE=""P""
515 PRINT AT 7,0: INK 6;"
HOLD=""H""
520 PRINT AT 9,0: INK 3;" 25
POINTS 55 POINTS"
530 PRINT AT 9,0: INK 6;"FB"

540 PRINT AT 9,13: INK 2;"CD"
550 PRINT AT 12,3: PAPER 1;" P
RESS ANY KEY TO START"
570 FOR F=2 TO 6
580 PRINT AT 0,0: INK f;"
CAVERN BLAST
590 IF INKEY$ <> "" THEN CLS
: GO TO 1000
595 PAUSE 14
600 NEXT f
610 GO TO 570
1000 FOR f=5 TO 16
1005 BEEP .005,20
1010 PRINT AT f,0: INK 6: PAPER
1;"H"
1020 NEXT f
1030 FOR f=0 TO 255
1040 PLOT INK 4:f,175
1050 DRAW INK 4:0, RND *-30+-9

1051 PLOT INK 4:f,0
1055 DRAW INK 4:0, RND *36+3
1060 NEXT f
1200 LET ax=12
1210 LET bx=1
1220 LET cx=INT ( RND *10)+6
1230 LET dx=28
1232 LET ex=INT ( RND *10)+6
1235 LET fx=28
1240 LET sc=0
1250 LET li=4
1260 POKE 23672,0: POKE 23673,0

1290 FOR g=0 TO 20 STEP 5
1300 FOR f=-10 TO 0 STEP 3: BEEP
.01,f+g: NEXT f
1310 PAUSE 3: NEXT g
1500 PRINT AT ax,bx: BRIGHT 1;
INK 5;"A"
1510 IF INKEY$ ="Q" AND ax>5 TH
EN LET ax=ax-1: BEEP .001,60: P
RINT AT ax+1,bx;" "
1520 IF INKEY$ ="Z" AND ax<16 T
HEN LET ax=ax+1: BEEP .001,66:
PRINT AT ax-1,bx;" "
1530 IF INKEY$ ="P" THEN GO SU
B 3000
1540 IF INKEY$ ="H" THEN PAUSE
0
1600 PRINT AT cx,dx: BRIGHT 1;
INK 2;"CD "
1605 PRINT AT ex,fx: BRIGHT 0;
INK 6;"FB "
1610 LET dx=dx-2
1620 LET fx=fx-1
1630 IF dx=0 THEN GO SUB 3500
1634 IF fx=0 THEN GO SUB 3500

1700 IF sc>1000 AND sc<1100 THEN
GO SUB 3700
1710 IF sc>3000 AND sc<3100 THEN
GO SUB 3700
1720 IF sc>5000 AND sc<5100 THEN
GO SUB 3700
1730 IF sc>7000 AND sc<7100 THEN
GO SUB 3700
1990 PRINT INK 0: AT 0,0: PAPER
4;"SCORE ";sc: AT 0,25:"LIVES "
;li: AT 0,11:"HI: ";hi
2000 GO TO 1500
2550 NEXT g: NEXT f
3000 FOR f=1 TO 29 STEP 3
3010 PRINT AT ax,bx+f: INK 1;"B
BB"
3020 NEXT f
3025 BEEP .004,20: BEEP .004,40

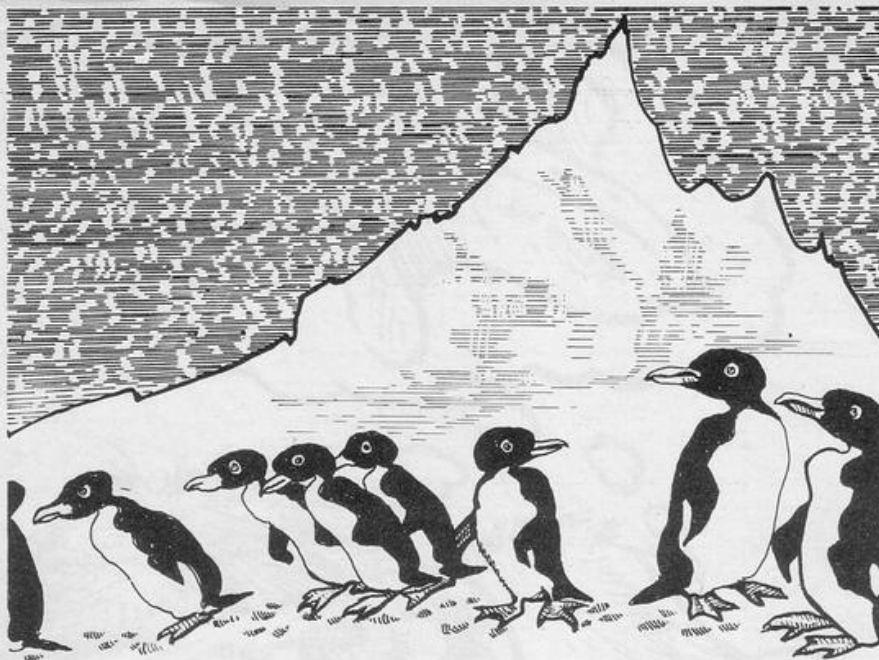
3030 PRINT AT ax,bx+1;"
"
3040 IF ax=cx THEN PRINT AT cx
,dx: INK 6: PAPER 2;"EE": FOR f=
0 TO 4: BEEP .001,55: NEXT f: LE
T sc=sc+55: PRINT AT cx,dx;" "
: LET cx=INT ( RND *10)+6: LET
dx=28
3050 IF ax=ex THEN PRINT AT ex
,fx: INK 6: PAPER 2;"EE": FOR f=
0 TO 4: BEEP .001,55: NEXT f: LE
T sc=sc+25: PRINT AT ex,fx;" "
: LET ex=INT ( RND *10)+6: LET
fx=28
3100 RETURN
3500 LET li=li-1
3510 PRINT AT 0,31: PAPER 4: IN
K 0: FLASH 1;li
3520 FOR f=0 TO 4
3530 FOR g=7 TO 1 STEP -1
3540 PRINT AT ax,bx: INK g;"A"
3545 BEEP .001,g+55

3550 NEXT g: NEXT f
3555 PRINT AT cx,dx+1;" "
3556 PRINT AT ex,fx+1;" "
3560 IF li=0 THEN GO TO 4000
3580 LET dx=28
3584 LET fx=28
3600 RETURN
3700 PRINT AT 11,5: INK 4;"BONU
S GUN": INK 5: BRIGHT 1;" + "; B
RIGHT 0: INK 6;"200 POINTS"
3705 FOR n=0 TO 1
3710 FOR g=0 TO 40 STEP 4
3720 FOR f=0 TO 15 STEP 4
3730 BEEP .02,f+g: NEXT f: NEXT
g
3740 NEXT n
3750 LET li=li+1
3760 FOR f=1 TO 40: LET sc=sc+5:
BEEP .001,45: PRINT AT 0,6: PA
PER 2: INK 7;sc: NEXT f
3770 FOR f=5 TO 27
3780 PRINT AT 11,f;" ": NEXT f

3790 PRINT AT cx,dx;" "; AT
ex,fx;" "
3800 LET dx=28: LET fx=28
3810 RETURN
4000 PRINT AT 10,7: FLASH 1: IN
K 5;"G A M E O V E R"
4001 FOR f=0 TO 100: BORDER 7: 0
UT 34300,20: BORDER 0: NEXT f
4002 FOR f=0 TO 100: BORDER 7: 0
UT 34350,100: OUT 34300,20: BORD
ER 0: NEXT f
4005 FOR f=0 TO 1
4010 BEEP .1,-30: BEEP .1,-20: B
EEP .1,-17: BEEP .1,-23
4015 NEXT f
4020 PRINT AT 12,3:"CAVERN FORT
RESS DESTROYED!"
4030 FOR f=-15 TO -35 STEP -5
4040 BEEP .13,f
4050 NEXT f
4060 PRINT AT 14,7;"YOU HAVE FA
ILED!"
4070 FOR f=0 TO 55
4080 BEEP .005,10: BEEP .005,20:
BEEP .005,0

4090 NEXT f
4100 IF sc>hi THEN LET hi=sc
4200 IF li=0 THEN GO TO 4300
4300 LET t= PEEK 23672+256* PEEK
23673
4400 IF li=0 THEN PRINT AT 18,
3: INK 5;"YOU LASTED ";t/50;" SE
CONDS"
4450 IF INKEY$ <> "" THEN GO
TO 4450
4500 IF INKEY$ =" " THEN GO TO
4500
4600 CLS : GO TO 500
9000 SAVE "CAVERN" LINE 1

```

COLLECT FOOD supplies for the penguins from a remote area of the South Atlantic. When you leave the boat you discover that the food is stored on an iceberg which is melting slowly. You have the ability to jump out of deep holes and also to dig and fill in the smaller holes.

Iceberg was written for the 16K Spectrum by Kim and Kerry Tomlinson of Parkside, Stafford.

ICEBERG

```

1 LET hi=0
8 FOR n=0 TO 47: READ r: POKE
USR "a"+n,r: NEXT n
10 DATA 0,51,204,0,51,204,0,0,
24,24,0,126,24,24,24,60
11 DATA 255,127,63,31,15,7,3,1
,255,254,252,248,240,224,192,128

12 DATA 255,102,102,255,255,25
5,255,255
15 DATA 60,24,24,102,243,245,1
26,60
37 LET sc=0: LET b=0: LET z=0:
LET f=0: LET m=0: LET x1=19: LE
T y1=19: LET x=19: LET y=19: BOR
DER 1: PAPER 5: CLS : LET i$="(2
8*ig8)"
40 PRINT AT 0,12;"(i:I:iC:iE:i
B:iE:iR:iG)": AT 3,2;"You must f
ill your boat with penguin me
at supplies from a remote area
of iceland.But you find it is
an iceberg melting beneath yo
ur feet!Can you get t
he suplys?"
43 PRINT AT 10,10;"5=left 8=r
ight
7(then 8 or 5)=jum
p"
44 PRINT AT 12,2;"6(then 8 or
5)=fill in/dig out (alternate
) - ONLY ON A LEVEL ((2*ig8) n
ot (ig8:ig3) or (ig3:ig8))": AT
15,2;"0=get out of deep hole"
45 INPUT "DIFFICULTY 2 TO 9 ";
di: CLS
46 LET ch=di
49 LET m=0: LET ba=0
50 PRINT BRIGHT 1: PAPER 1: I
NK 7: AT 21,0;"AAAAAAAAAAAAAAAA
AAAAAAAAAAAAAAAA"
51 PRINT AT 20,20;"CEEEEEEEEE
ED"
57 PRINT PAPER 3: AT 0,0;"CHA
NCES=";ch;" DIFFICULTY=";di;" SC
ORE=";sc;" "
60 FOR n=20 TO 14 STEP -1: PRI
NT AT n,0: INK 7;i$ (TO n): NEX
T n
62 PRINT INK 6: AT 3,25;"(2*i
g8)": AT 4,25;"(2*ig8)"
65 FOR n=7 TO 12: CIRCLE INK
6;207,144,n: NEXT n
66 INK 0
69 PRINT AT 13,0;"F"

```

```

70 PRINT AT y,x;"B": IF b=1 T
HEN PRINT INK 2: AT y-1,x;"F"

80 LET m=m+1: IF m=di*9 THEN
GO TO 300
85 IF INKEY$ ="6" THEN GO TO
500
90 IF INKEY$ ="7" THEN GO TO
400
95 IF INKEY$ ="0" AND ch>0 TH
EN GO TO 200
100 IF INKEY$ ="8" THEN LET x
1=x+1: PRINT AT y,x;" "; AT y-1
,x;" "
110 IF INKEY$ ="5" THEN LET x
1=x-1: PRINT AT y,x;" "; AT y-1
,x;" "
120 IF x1<0 THEN LET x1=x
125 IF ATTR (y1,x1)=47 THEN L
ET x1=x
130 IF ATTR (y1+1,x1)=40 THEN
LET y1=y+1: LET f=0
135 IF ATTR (y1-1,x1)=40 THEN
PRINT AT y1-1,x1;" "; AT y1-2
,x1;" "
140 IF y+1=21 THEN GO TO 1000

145 IF y=19 AND x1=19 AND b=1 T
HEN GO TO 700
150 LET x=x1: LET y=y1
155 IF x=0 AND b=0 THEN BEEP .
1,.5: LET b=1
160 GO TO 70
200 PRINT AT y,x;" "; AT y-1,x
;" ": LET y=y-10: LET x=x+1: LET
y1=y1-10: LET x1=x+1
210 LET ch=ch-1: PRINT PAPER 3
; AT 0,8;ch: FOR l=0 TO 50: NEXT
l: GO TO 70
300 LET x2= INT ( RND *12)+1
305 LET t=14+ INT ( RND *(y-11.
7))
307 FOR g=14 TO t: PRINT AT g
,x2;" ": IF ATTR (g+1,x2)=47 THE
N GO TO 308+ RND *2
309 NEXT g: GO TO 312
310 PRINT AT g+1,x2;" "
312 LET m=0
320 PRINT AT y,x;" "; AT y-1,x
;" ": GO TO 100
400 LET y1=y-1
410 IF INKEY$ ="8" THEN LET x
1=x+1: GO TO 430
420 IF INKEY$ ="5" THEN LET x

```

```

1=x-1: GO TO 430
425 GO TO 410
430 IF ATTR (y1,x1)=47 THEN L
ET y1=y: LET x1=x: GO TO 70
435 PRINT AT y,x;" "; AT y-1,x
;" "
440 PRINT AT y1,x1;"B": PAUSE
500: PRINT AT y1,x1;" "; AT y1-
1,x1;" "
450 IF x1=x+1 THEN LET x1=x+2:
LET x=x+1
460 IF x1=x-1 THEN LET x1=x-2:
LET x=x-1
470 LET y=y1: GO TO 120
520 IF INKEY$ ="5" THEN LET x
3=x-1: GO TO 537
530 IF INKEY$ ="8" THEN LET x
3=x+1: GO TO 537
535 GO TO 520
537 IF z=1 THEN GO TO 600
540 IF ATTR (y,x3)=47 THEN GO
TO 70
550 IF ATTR (y+1,x3)=40 THEN
GO TO 70
560 PRINT AT y+1,x3;" "; AT y
,x3;" ": LET z=z+1
565 PAUSE 500
570 GO TO 70
600 IF ATTR (y+1,x3)=47 THEN
GO TO 70
610 FOR h=y+1 TO 20
620 IF ATTR (h+1,x3)=47 THEN
GO TO 650
630 NEXT h
640 GO TO 70
650 LET y3=h: PRINT AT y3,x3:
INK 7;"(ig8)": AT y3-1,x3;"(ig8)
": LET z=0: GO TO 70
700 PRINT INK 2: AT 19,21+ba;"
F": AT 13,0;"F": LET ba=ba+1: LE
T b=0: LET sc=sc+1: IF ba=10 THE
N GO TO 800
705 BEEP .3,ba/2
710 PRINT PAPER 3: AT 0,29;sc:
GO TO 70
800 PRINT AT 6,3;"WELL DONE!.N
EXT SHIPMENT!": FOR l=0 TO 60: N
EXT l: PAUSE 0: CLS : LET di=di-
1: GO TO 49
1000 IF sc>hi THEN LET hi=sc
1001 PRINT AT 6,6;"You Have Dro
wned!": AT 8,13;"hi=";hi
1002 FOR l=0 TO 60: NEXT l
1003 PAUSE 0: GO TO 10

```


GUESS WHAT was written for the 16K ZX-81 by David Hughes of Tunbridge Wells, Kent and is a game for two players. Choose a subject and then choose a word up to eight letters long. Players then type-in words without showing them to their opponent. A section of the screen is blacked-in and the words are then built gradually so that they appear in silhouette against the black background. The object is for you to work out what the word is before it is completed.

GUESS WHAT



```

1 PRINT AT 0,11;"GUESS WHAT"
2 PRINT AT 10,0;"PRESS ANY KE
Y TOR
3 PAUSE 4E4
4 CLS
10 LET U=0
20 LET U=0
30 LET F=1
40 PRINT "THIS IS A GAME FOR T
WO PEOPLE";AT 2,0;"TYPE IN THE F
IRST PERSONS NAME"
50 INPUT A$
60 PRINT AT 5,0;"TYPE IN THE S
ECOND PERSONS NAME"
70 INPUT B$
80 CLS
90 PRINT "HELLO ";A$;" AND ";B
$
100 PRINT AT 3,0;"DECIDE ON A S
UBJECT AND CHOOSE";AT 5,0;"A WOR
D UP TO 8 LETTERS LONG"
110 PRINT AT 11,0;A$;" TYPE IN
YOUR WORD";AT 13,0;"DO NOT LET Y
OUR PARTNER SEE"
120 INPUT C$
122 IF LEN C$>8 THEN GOTO 120
125 CLS
130 PRINT B$;" IT IS YOUR TURN
NOW"
140 INPUT D$
150 IF LEN D$>8 THEN GOTO 140
160 LET E$=C$
165 LET F$=D$
170 CLS
180 PRINT
190 DIM G(54,8)
200 LET J$=LEN E$
210 DIM J$(1,1)
220 FOR K=1 TO I
230 LET J$(1,K)=E$(1,K)
240 FOR L=0 TO 7

```

```

310 LET P=PEEK (7680+C*8+L)
320 LET M=128
330 FOR N=0 TO 7
340 IF P<M THEN GOTO 370
350 LET G(8*K+25-4*I+N,8-L)=1
360 LET P=P-M
370 LET M=M/2
380 NEXT N
390 NEXT L
400 NEXT K
410 SLOW
420 PRINT "PRESS ANY KEY TO STA
RT"
430 PRINT AT 2,0;"IT IS YOUR TU
RN ";F$
440 PAUSE 4E4
450 PRINT AT 11,0;"HOLD ANY KEY
TO STOP AND HAVE";AT 12,0;"A GU
ESS. A WRONG ANSWER WILL COST YOU
";AT 13,0;"5 POINTS"
470 LET S=0
472 DIM A(64)
474 FOR N=1 TO 64
475 LET A(N)=N
476 NEXT N
478 FOR M=63 TO 1 STEP -1
480 LET H=INT (RND*M)+1
482 LET Y=INT (A(H)/8)
484 LET X=(A(H)-Y*8)*8
486 LET A(H)=A(M)
488 FOR R=0 TO 7
490 IF G(X+R+1,Y+1)<>1 THEN PLO
T X+R,Y+27
494 NEXT R
496 LET S=S+1
498 PRINT AT 15,0;"SCORE=";S
500 IF INKEY$<" " THEN GOTO 550
510 NEXT M
520 PRINT AT 18,0;"YOU HAVE FAI
LED TO GUESS";AT 19,0;"YOUR SCOR
E IS ";S
530 PAUSE 300

```

```

540 GOTO 600
550 INPUT 0$
560 IF 0$=E$ THEN PRINT AT 13,0
;"YOU HAVE GUESSED THE CORRECT";
AT 19,0;"WORD AND YOUR SCORE IS
";S
565 PAUSE 300
570 IF 0$=E$ THEN GOTO 600
580 LET S=S+5
590 GOTO 480
600 IF F$=A$ THEN GOTO 640
610 LET U=U+S
620 LET F$=A$
625 LET E$=D$
630 GOTO 170
640 LET U=U+S
650 CLS
660 PRINT "SCORE AT THE END OF
ROUND ";F$;" IS";AT 2,10;A$;"=";U
;AT 3,10;B$;"=";U
670 PAUSE 300
680 PRINT AT 8,8;"DECIDE WHAT T
O DO"
690 PRINT AT 10,0;"1-ANOTHER GA
ME WITH YOUR PARTNER";AT 12,0;"2
-CHANGE PARTNERS";AT 14,0;"3-DO
NOT WANT TO PLAY ANY MORE"
700 PRINT AT 18,0;"TYPE IN YOUR
SELECTED NUMBER";AT 19,0;"AND P
RESS NEWLINE"
710 INPUT Z
720 IF Z<0 OR Z>3 THEN GOTO 710
730 CLS
740 IF Z=3 THEN NEW
750 IF Z=2 THEN GOTO 1
760 LET F$=F+1
770 GOTO 90
1000 SAVE "GUESS WHAT"
1100 GOTO 1

```


ZX81 ANIMATION

USING the facilities in ZX-81 Animation produces an animated picture. There are five pictures used to create the animation but that number can be changed when creating your own scenes to allow more pictures to be used. To enable more pictures to be drawn, change line 10 to DIM A\$(10,704) and line 3070 to FOR N=1 TO 10.

Written for the 16K ZX-81 by Gareth Poxon, aged 11, of Kirkhouse, Cumbria.



```

1 REM DRAW/STORE IN STRING
10 DIM A$(8,704)
40 PRINT "HELLO"
50 PRINT AT 4,0;"THIS PROGRAM
WILL STORE UP TO FIVE DRAWINGS
AND ENABLE YOU TO VIEW,AMEND OR
COPY THEM"
52 PRINT
54 PRINT "DRAWINGS STORED WITH
PREVIOUSLY USED NUMBERS ERASE T
HE EARLIER DRAWING"
56 PRINT AT 21,0;"TO CONTINUE
PRESS NEWLINE"
60 IF INKEY$="" THEN GOTO 60
100 CLS
110 PRINT "MENU"
120 PRINT AT 4,0;"D:TO DRAW"
130 PRINT
140 PRINT "U:VEIW OR COPY"
150 PRINT
160 PRINT "R:RECORD DRAWINGS ON
TAPE"
162 PRINT
163 PRINT "N:ANIMATE"
165 PRINT AT 20,0;"PRESS KEY CO
RRESPONDING TO THE FUNCTION YOU
REQUIRE"
170 IF INKEY$="D" THEN GOTO 300
180 IF INKEY$="U" THEN GOTO 400
190 IF INKEY$="R" THEN GOTO 500
0
195 IF INKEY$="N" THEN GOTO 300
0
200 GOTO 170
300 CLS
310 PRINT "DRAW"
320 PRINT AT 4,0;"D: DRAW"
330 PRINT
340 PRINT "E:ERASE"
350 PRINT
360 PRINT "T:TRANSPORT"
365 PRINT
370 PRINT "M:RETURN TO MENU"
375 PRINT
380 PRINT "KEYS 3 TO 0:CONTROL
DIRECTION"
381 PRINT
382 PRINT
385 PRINT "WHEN DRAWING IS FINI
SHED PRESS S TO STORE/COPY THEN
ENTER DRAWING NUMBER AND PRESS N
EWLINE"
390 PRINT AT 21,0;"NOW PRESS NE
WLINE TO START"
395 IF INKEY$="" THEN GOTO 395
398 GOTO 1000
400 CLS
410 PRINT "VEIW OR VEIW AND COP
Y"
420 PRINT AT 4,0;"M:TO RETURN M
ENU AT ANY TIME"
425 PRINT

```

```

430 PRINT "C: COPY"
435 PRINT
440 PRINT "A:AMEND DRAWING (USI
NG THE SAME KEYS AS FOR DRAWING)"
445 PRINT
450 PRINT
460 PRINT "WHICH NUMBER DRAWING
DO YOU WISH TO VEIW? (ENTER
NUMBER THEN NEWLINE)"
470 INPUT Z
480 CLS
485 PRINT A$(Z)
490 IF INKEY$="M" THEN GOTO 100
495 IF INKEY$="A" THEN GOTO 102
0
500 IF INKEY$="C" THEN COPY
505 GOTO 490
510 GOTO 100
1010 CLS
1020 LET X=32

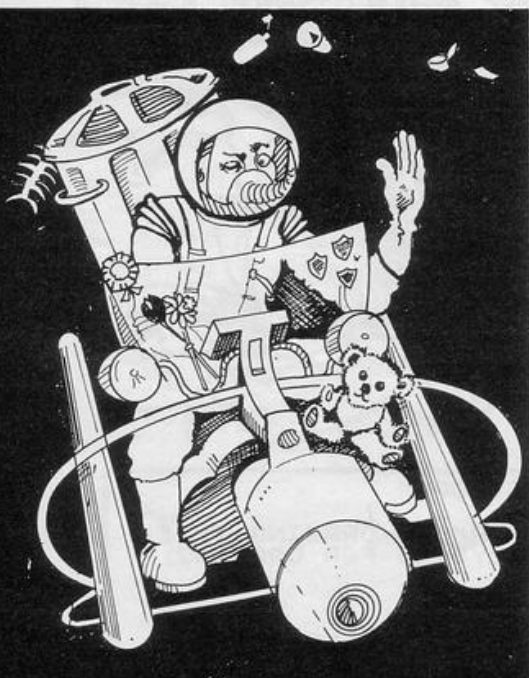
```



```

1030 LET Y=22
1040 GOSUB 1500
1050 UNPLOT X,Y
1060 PLOT X,Y
1070 GOTO 1040
1080 GOSUB 1500
1090 GOTO 1080
1100 GOSUB 1500
1110 PLOT X,Y
1120 UNPLOT X,Y
1130 GOTO 1100
1500 IF INKEY$="D" THEN GOTO 104
0
1510 IF INKEY$="T" THEN GOTO 108
0
1520 IF INKEY$="S" THEN GOTO 200
0
1530 IF INKEY$="E" THEN GOTO 110
0
1535 IF INKEY$="M" THEN GOTO 100
1540 IF INKEY$="5" THEN LET X=X-
1
1550 IF INKEY$="6" THEN LET Y=Y-
1
1555 IF Y=43 THEN GOTO 1590
1560 IF INKEY$="7" THEN LET Y=Y+
1
1565 IF X=63 THEN GOTO 1590
1570 IF INKEY$="8" THEN LET X=X+
1
1572 IF INKEY$="9" THEN LET Y=Y+
1
1574 IF INKEY$="9" THEN LET X=X+
1
1576 IF INKEY$="0" THEN LET X=X+
1
1578 IF INKEY$="0" THEN LET Y=Y-
1
1580 IF INKEY$="4" THEN LET X=X-
1
1582 IF INKEY$="4" THEN LET Y=Y+
1
1584 IF INKEY$="3" THEN LET X=X-
1
1586 IF INKEY$="3" THEN LET Y=Y-
1
1588 IF Y=43 THEN GOTO 1590
1590 RETURN
2000 INPUT A
2005 PRINT AT 21,0;A;" "
2007 FAST
2010 FOR I=0 TO 21
2020 FOR J=1 TO 31
2030 LET A$(A,J+32*I)=CHR$ PEEK
(PEEK 16396+256*PEEK 16397+J+33*
I)
2040 NEXT J
2050 NEXT I
2060 SLOW
2070 GOTO 100
3000 CLS
3010 PRINT "ANIMATE"
3020 PRINT
3030 PRINT "M:RETURN TO MENU"
3040 PRINT AT 21,0;"PRESS NEWLIN
E TO START"
3050 IF INKEY$="" THEN GOTO 3050
3055 IF INKEY$="M" THEN GOTO 100
3060 CLS
3070 FOR N=1 TO 5
3080 PRINT A$(N)
3085 PRINT AT 0,0;
3090 NEXT N
3100 IF INKEY$="M" THEN GOTO 100
3110 GOTO 3070
5000 CLS
5010 PRINT "SAVE ON TAPE"
5020 PRINT AT 4,0;"WHAT FILE NAM
E DO YOU WISH TO USE? "
5030 PRINT
5040 PRINT "ENTER FILENAME AND P
RESS NEWLINE"
5050 INPUT F$
5060 CLS
5070 PRINT "START TAPE RECORDER
IN RECORD MODE THEN PRESS NEWLIN
E"
5080 IF INKEY$="" THEN GOTO 5080
5090 SAVE F$
5100 GOTO 100

```



YOU ARE the Cosmic Dust-man and it is your job to pick up all the rubbish. Watch for the stars and black holes which must be avoided but collect the mystery dustbins to score points. Beware, as the bins may conceal a black hole.

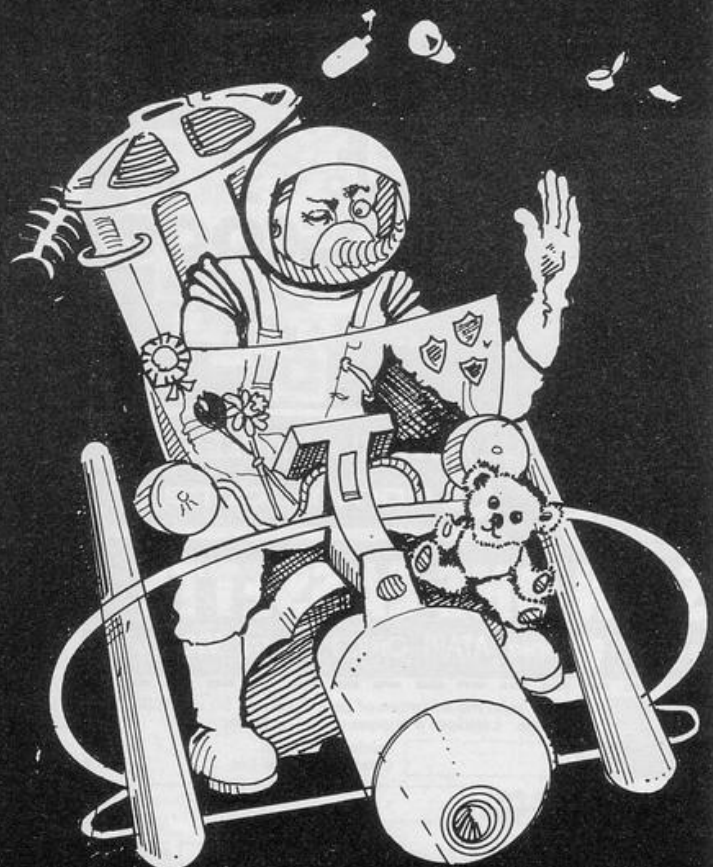
Written for the 16K ZX-81 by Andrew Pitcher of Dursley, Glos.

COSMIC DUSTMAN

```

1 GOSUB 4000
5 LET REM=20
10 LET INK=PEEK 16396+256*PEEK
16397+1
20 LET SCORE=0
30 LET HI SCORE=0
40 LET BORDER=16418
50 LET MEN=3
60 POKE BORDER,0
70 FOR I=0 TO 23
80 PRINT "
90 NEXT I
100 LET FUEL=150
110 PRINT AT 23,1;"FUEL
120 FOR I=1 TO 40
130 LET PAPER=INT (RND*660)+INK
+66
140 IF PEEK PAPER<>128 THEN GOT
0 130
150 POKE PAPER,155
160 NEXT I
170 FOR I=1 TO 20
180 LET PAPER=INT (RND*660)+INK
+66
190 IF PEEK PAPER<>128 THEN GOT
0 180
200 POKE PAPER,143
210 NEXT I
220 LET MODE=INK+35
230 LET MAN=INK+45
240 LET CHAR=141
250 LET DD=0
260 POKE MAN,CHAR
265 IF MEN=0 THEN GOTO 1000
268 IF REM=0 THEN GOTO 2000

```

```

270 POKE MODE,128
280 LET D=(INKEY$="8")-(INKEY$="
5")+33*((INKEY$="6")-(INKEY$="7
"))
290 POKE MODE,141
300 IF PEEK (MAN+D)=128 THEN LE
T DD=D
310 IF PEEK (MAN+D)=128 THEN GO
TO 400
320 IF PEEK (MAN+D)=155 THEN GO
TO 500
330 IF PEEK (MAN+D)=143 THEN GO
TO 600
340 IF PEEK (MAN+D)=8 THEN POKE
MAN,8
350 IF PEEK (MAN+D)<>128 THEN G
OTO 260
400 LET MAN=MAN+D
410 LET CHAR=141
420 POKE MAN,CHAR
430 POKE MAN-D,128
440 LET FUEL=FUEL-1
450 IF FUEL=0 THEN GOTO 900
460 GOTO 260
500 FOR I=1 TO 50
510 POKE MAN,8
520 POKE MAN,128
530 POKE MAN,8
540 POKE MAN,128
550 NEXT I
560 LET MEN=MEN-1
570 IF MEN=0 THEN GOTO 1000
580 GOTO 260
600 LET FOU=INT (RND*5)+1
610 IF FOU=1 THEN POKE MAN,147
620 IF FOU=1 THEN PRINT AT 0,0;
"ABANDONED SHUTTLE 1000 POINTS"
630 IF FOU=1 THEN LET SCORE=SC
ORE+1000
640 IF FOU=2 THEN POKE MAN,151
650 IF FOU=2 THEN PRINT AT 0,0;
"RUSSIA SATELLITE 2000 POINTS"
660 IF FOU=2 THEN LET SCORE=SC
ORE+2000
670 IF FOU=3 THEN POKE MAN,180
680 IF FOU=3 THEN PRINT AT 0,0;
"A BLACK HOLE 1 LIFE LOST"
690 IF FOU=3 THEN LET MEN=MEN-1
700 IF FOU=4 THEN POKE MAN,140
710 IF FOU=4 THEN PRINT AT 0,0;
"COSMIC WASTE 0000 POINTS"

```

```

720 IF FOU=5 THEN GOTO 770
730 LET REM=REM-1
740 IF REM=0 THEN GOTO 2000
750 POKE MAN+D,128
760 GOTO 260
770 DIM A$(6,31)
780 LET A$(1)="A ASTRONAUTS HEL
MET"
790 LET A$(2)="A LASER GUN"
800 LET A$(3)="ONE ASTRONAUTS B
OOT"
810 LET A$(4)="A TIN OF BEANS"
820 LET A$(5)="A DEAD ASTRONAUT"
830 LET A$(6)="A SCRAP OF A SH
UTTLE"
840 LET MON=INT (RND*6)+1
850 PRINT AT 0,0;A$(MON)
851 LET REM=REM-1
852 IF REM=0 THEN GOTO 2000
860 POKE MAN+D,128
870 GOTO 260
900 PRINT AT 23,0;"FILE"
910 POKE MAN,128
930 GOTO 1000
1000 PRINT AT 10,7;"GAME O
VER";AT 0,0;
1030 PRINT AT 1,0;"SCORE ";SCOR
E;AT 2,0;"HIGH SCORE ";
1040 IF SCORE>HI SCORE THEN PRIN
T SCORE;" "
1050 IF SCORE>HI SCORE THEN LET
HI SCORE=SCORE
1055 IF SCORE<HI SCORE THEN PRIN
T HI SCORE;" "
1060 PRINT AT 3,0;"ANOTHER GAME
?"
1070 IF INKEY$<>"Y" THEN GOTO 10
70
1080 CLS
1090 LET SCORE=0
1100 LET REM=20
1110 LET MEN=3
1120 GOSUB 4000
1130 GOTO 40
2000 PRINT AT 0,0;"STAGE COMPLET
E REACH TO TELEPORT"
2010 POKE MAN,128
2020 POKE MAN-D,128
2030 LET REM=20
2031 FOR I=1 TO 50
2032 NEXT I
2033 CLS
2040 GOTO 70
3000 SAVE "COSMIC DUSTMAN"
3030 GOTO 0
4000 POKE 16418,0
4010 FOR I=0 TO 23
4020 PRINT "
4030 NEXT I
4040 PRINT AT 0,8;"COSMIC DUSTMA
N"
4050 PRINT AT 4,0;"YOU ARE THE C
OSMIC DUSTMAN AND IT'S YOUR TASK
TO PICK UP ALL THE COSMIC RUBBIS
H"
4070 PRINT "WATCH OUT FOR THE ST
ARS . AND THE BLACK HOLE !"
4080 PRINT "HIT THESE ? TO FIND
WHAT'S BEEN PICKET UP YOU MAY HA
VE FALLING INTO A BLACK HOLE"
4090 PRINT "USE KEYS 8 LEFT & RT
GHT 6 DOWN ? UP AFTER COMPLETIN
G ONE LEVEL YOU WILL GO TO ANOTH
ER SCREEN"
4095 PRINT "WATCH IT YOU COULD A
UN OUT OF FILE"
4100 PRINT AT 19,5;"PRESS A KEY
TO PLAY"
4110 FOR I=1 TO 5
4120 NEXT I
4130 PRINT AT 19,5;"PRESS A KEY
TO PLAY"
4140 FOR I=1 TO 5
4150 NEXT I
4160 IF INKEY$="" THEN GOTO 4100
4170 CLS
4180 RETURN

```


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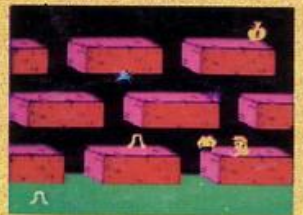
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